

# THE MISSING PIECES OF THE WEIGHT LOSS PUZZLE

*Overweight and obesity have serious consequences for health and ageing. The best advice for shedding kilograms includes keeping your brain in shape, maintaining optimal vitamin D levels, getting plenty of sleep and balancing your intestinal flora.*

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## Overweight: A Risk Factor in Numerous Diseases

Obesity has gone prime time. We see evidence of its presence wherever we look: in every neighbourhood, in every mall, in every school and in every workplace. Hardly a day goes by without news reports on some aspect of the looming obesity crisis.<sup>1,2</sup>

However, the epidemic is not confined to just the wealthy developed world. Even desperately poor countries such as Nigeria and Uganda are wrestling with the dilemma of obesity. China, which was once one of the world's leanest countries, is not immune: it has one of the fastest-growing obesity rates in the world, and one quarter of its urban youth is presently overweight.<sup>3</sup> It is projected that by 2015, 200 million Chinese will be not just obese but morbidly obese.<sup>4</sup>

The looming obesity epidemic is sending chills through the global community. Worldwide, more than 1.3 billion people are overweight, whereas only 800 million are underweight—and these statistics are diverging rapidly.<sup>5</sup>

The problem of expanding waistlines is more than merely a vanity concern. There are serious health consequences from sporting that beer belly. Being overweight can radically change the course of a person's life. Fat is toxic and potentially lethal. Just carrying as few as an extra 4.5 kilograms (10 pounds) over your ideal weight is considered a serious risk factor for heart disease, diabetes, high blood pressure, dementia and Alzheimer's disease, liver disease, hormonal imbalances, depression and cancer. In fact, at least 30 different diseases are related to being overweight.

## The Failure of Traditional Weight Loss Advice

So, what's going on here? If people were to follow the advice offered by medical professionals, public health officials and experts from the weight loss industry, the problem would be easily solved. The call to action basically involves turning your back on all those sugary, high-carbohydrate, processed junk foods and switching to a low-calorie diet fortified by plenty of exercise. They say that it all boils down to a very simple equation: take in fewer calories and burn more.

It sounds logical. The only problem is that this decades-old approach is a dismal failure. For the vast majority of people, it doesn't work. In fact, long-term success for attaining permanent weight loss is only achieved by a mere two to five per cent of those very determined and lucky dieters.

A definition of insanity is doing the same thing over and over again and expecting a different outcome. It certainly appears that the traditional approach to winning the battle of the bulge does indeed seem insane.

If there are answers and successful strategies to stem the tide of this serious health epidemic, they will need to be sought elsewhere.

It's time to discover some of the missing pieces of the weight loss puzzle.

## Secrets of the Brain–Belly Connection

Do you value your brain power? Certainly, the one faculty that everyone wants to hold onto throughout a lifetime is a fully functioning, intact brain. Unfortunately, belly fat can deliver a serious blow to that aspiration. Overwhelming evidence now reveals that your expanding waistline will put a serious crimp on your brain size as well as your brain power.

Researchers set out to discover if being overweight posed a danger to the brain. They scanned the brains of 94 people over the age of seventy. They were looking to see the differences in the brains of people who were normal weight (BMI under 25), overweight (BMI 25–30) and obese (BMI over 30).<sup>6</sup> (BMI stands for "body mass index", an approximation of body fat based on height and weight.) Their results were quite shocking. Overweight people had four per cent less brain tissue than people of normal weight. For obese people, the findings were even worse: they had *eight per cent less* brain tissue than people of normal weight.

The study showed that carrying extra weight not only degenerated the brain but also accelerated its ageing. Researcher Paul Thompson shared his observation: "The brains of overweight people looked eight years older than the brains of those who were lean, and 16 years older in obese people. Type 2 diabetes,

which is common in the overweight, is known to accelerate the ageing of the brain and the onset of dementia. But the relationship between brain size and weight still stood when the researchers accounted for this, suggesting it is the fat itself that is causing the problem. It is thought that high levels of fat raise the odds of the arteries clogging up, cutting the flow of blood and oxygen to the brain. This could cause brain cells to die and the organ to shrink."<sup>7</sup> The high demands put on these brain areas may make them more sensitive to changes in oxygen levels.

Another study used magnetic resonance imaging to compare the brains of 44 obese individuals with those of 19 lean people of similar age and background. The obese individuals had more water in the amygdala, a part of the brain involved in eating behaviour. The imaging also showed a smaller orbitofrontal cortex in the obese—which is of concern, considering that this area of the brain is important for impulse control and is also involved in eating behaviour. These findings strengthen the "slippery slope" theory of obesity. The neural changes that occur when you are overweight affect the parts of your brain that influence and control so many behaviours necessary to make healthy choices.<sup>8</sup>

Further studies indicate that those with the most belly fat (visceral fat mass) suffer the greatest mental declines over time, and that central or abdominal obesity in particular accounts for more than a threefold increase in dementia risk.<sup>9,10</sup>

What's even more worrying is that increased belly fat is linked to decreases in total brain volume, independent of BMI. This can cause changes in another area of the brain, the hippocampus, which is responsible for long-term memory, spatial memory and navigation.<sup>11,12</sup> Finally, excess belly fat also appears to contribute to lesions in the brain's white matter, especially in diabetic patients, linking it not just to memory loss but also to increased risk of stroke.<sup>13</sup>

Obesity also causes changes to the immune system which fan the flames of inflammation throughout the body. This increased inflammation can have an impact on the brain and lead to a vicious cycle of gaining more and more weight: obesity leads to inflammation, which damages certain parts of the brain, which in turn leads to more uncontrolled eating and more obesity.

There are many areas of the brain that are affected by overweight:

- frontal and temporal lobes, critical for planning, memory and impulse control;
- anterior cingulate gyrus, responsible for attention and executive functions;
- hippocampus, important for long-term memory, spatial memory and navigation;
- basal ganglia, essential for proper movement and coordination.

Here is the catch 22: those extra kilograms impair brain function and compromise the particular areas of the brain that have an impact on a person's ability to have a keen memory, to control impulses and to follow through on any kind of planning. It therefore becomes more difficult to commit successfully to any kind of program, especially a weight loss program. Since the impulse-control part of the brain is affected, controlling those urges to help you to another doughnut or a second helping of mashed potatoes is an Herculean effort and generally doomed to fail.

## Vitamin D: A Key to a Healthy Metabolism

There is one really important nutritional player when it comes to our health. This superstar nutrient is the sunshine hormone, vitamin D. (Vitamin D is really a steroid hormone rather than an actual vitamin.)

Vitamin D truly deserves the title of "superstar". Each year, vitamin D researchers discover additional health benefits conferred by this sunshine vitamin. Vitamin D

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receptors are found throughout the body, including in the brain. Optimal levels are absolutely necessary to ensure healthy bones and arteries, a robust immune system, balanced moods and optimal cognitive function as well as protection from hypertension, allergies, multiple sclerosis, Alzheimer's disease, autoimmune conditions, fertility problems and premenstrual syndrome. Most significantly, vitamin D has been proven to be protective against 13 different kinds of cancer.<sup>14</sup> Optimal levels of vitamin D are critical for good health.

Here are some basic facts that you need to know about vitamin D. It is a fat-soluble steroid hormone that is made by the body as well as from what we eat. In order for the body to produce vitamin D (cholecalciferol), the skin must be exposed to ultraviolet light, primarily from sunlight. Vitamin D is further metabolised in the liver and kidneys to create the fully active form of vitamin D. Thus variations in sunlight exposure due to latitude, season, time of day, sunscreen use, skin pigmentation and age will determine how much vitamin D the body makes.

Although it is known that vitamin D plays a vital role in the well-being of infants, children, adults and the elderly, we presently have a global pandemic of chronically low vitamin D levels. It's estimated that 85 per cent of the American public are deficient, as are as much as 95 per cent of all its senior citizens.<sup>15</sup> Vitamin D deficiencies are also widespread throughout the UK, with 86 per cent of the population deficient in the winter and 57 per cent in the summer.<sup>16</sup>

Even though Australia is described as a "sunburnt" country and is one of the sunniest

countries in the world, a surprising number of its citizens are severely lacking in vitamin D. A recent report stated that as many as one in three Australians may have low vitamin D levels.<sup>17</sup>

For all those on a weight loss quest, vitamin D is one of those missing pieces that you've been searching for. There is overwhelming evidence that confirms the importance of keeping your vitamin D levels up to get your extra kilos down. Not only does it help achieve weight loss, it also improves other risk factors such as insulin resistance, metabolic syndrome and blood-sugar imbalances.

If you are feeling hungry all the time no matter how much you eat, you might want to have your vitamin D

levels checked. What drives insatiable hunger is the relationship between low vitamin D levels and a hormone called leptin. Leptin is a messenger molecule, made in fat cells, that communicates with the hypothalamus, letting it know how much fat is stored in the body. It is the hormone that communicates that your stomach is full.

Low vitamin D levels interfere with the effectiveness of leptin. Researchers at Aberdeen University, Scotland, found that obese people produced 10 per cent less vitamin D than people of average weight. The study discovered that low levels of the vitamin in blood interfered with the function of leptin. The study also found that excess body fat absorbs vitamin D, stopping it from entering the bloodstream. The 2008 study's

leader, Dr Helen Macdonald, of Aberdeen University's Department of Medicine and Therapeutics, commented: "Obese people had less vitamin D and the link between obesity and vitamin D deficiency was statistically significant."<sup>18</sup>

Overweight people, shirking sunlight or not taking adequate vitamin D supplementation, thwart their dieting efforts in another way. Low vitamin D levels have been shown to increase fat storage. A 2009 Canadian study found that weight and body fat were significantly lower in women with normal vitamin D levels than in women with insufficient levels.<sup>19</sup>

It seems that fat people may be less able to convert vitamin D into its hormonally active form. A Norwegian study found that the more that participants weighed, the lower their vitamin D levels tended to be. The researcher, Zoya Lagunova, MD, believes that obesity is associated with lower vitamin D levels since vitamin D

is a fat-soluble vitamin. "Much of the vitamin D produced in the skin or ingested is distributed in fat tissue, so obese people may take in as much vitamin D from the sun, food or supplements as people who are not obese, but their [blood] levels will tend to be lower. Obese people may need more vitamin D to end up with the same levels as a person whose weight is normal," she stated.<sup>20</sup>

How much less vitamin D does an overweight person make? As it turns out, increased fatty cells can decrease the ability to make vitamin D by a factor of four. This means that if you are carrying extra weight, you may make only a quarter the amount of vitamin D compared to a leaner person.

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Vitamin D is also an important factor in diabetes. Low levels of vitamin D have been linked to an increased risk of developing type 2 diabetes. After following more than 5,000 people for five years, an Australian research team found that those with lower-than-average vitamin D levels had a 57 per cent increased risk of developing diabetes compared to those within the recommended range.<sup>21</sup>

Low levels of vitamin D are also known to nearly double the risk of cardiovascular disease if you already have diabetes.<sup>19</sup> Diabetics, who are deficient in vitamin D and cannot process cholesterol normally, tend to have cholesterol build up in their blood vessels, hence increasing the risk of heart attack and stroke.

Vitamin D also helps keep blood-sugar levels under control. With type 2 diabetes, the body can't efficiently use the insulin it produces to control blood-sugar levels. Vitamin D plays a role by increasing the release of insulin. In one study, researchers evaluated vitamin D levels and the chance of developing unbalanced blood-sugar metabolism. In this study, subjects were evaluated for serum vitamin D levels and were followed for seven years to determine the effects on blood-sugar metabolism. The study showed that the subjects with the highest vitamin D levels had a 40 per cent increase in supporting an optimal future blood-sugar balance.<sup>22</sup>

If you want to lose weight and keep it off, it is critical to check your vitamin D levels. The higher your vitamin D levels, the higher your leptin levels and the more your blood sugar will remain balanced. Vitamin D helps your body respond to the correct metabolic messages. High vitamin D levels increase your ability to lose weight, and losing weight will increase your vitamin D levels—all of which will reduce your risk of metabolic syndrome, insulin resistance, diabetes and cardiovascular disease, not to mention most chronic illnesses.

While it is important for most people—especially the overweight, children and elderly—to take vitamin D supplements, it is critically important to check your vitamin D levels. Taking a vitamin D supplement may not get you into optimal range, which is where you want to be. It's optimal blood vitamin D levels that count. The proper blood test is called 25-hydroxyvitamin D (25-OH vitamin D), which is included in the basic blood work-up. In Australia, optimal levels should be 150–200

nmol/L. In the USA, optimal levels should be between 70 and 100 ng/mL. Do not settle for less than optimal levels if your goal is the best health possible.

### **Sleep Away Those Kilos!**

We all know about beauty rest, but do you know about thinness slumber? Getting those zzzzs is another important piece of the weight loss puzzle.

Your carbohydrate addiction may be more the result of your sleeping patterns rather than your lack of willpower. Have you ever noticed that after a night with little sleep, you wake up ravenously hungry and want to devour everything in sight? Why? Because your lack of sleep actually triggers food cravings.

An expanding body of scientific evidence shows that the less sleep you get, the more cravings you have; the more calories you eat, the more belly fat you have and the higher your BMI.

One study found that sleep-deprived people eat more carbohydrates than their more well-rested compatriots. Those with four hours of sleep were more likely to choose candy, cakes and cookies over fruit, vegetables and dairy products. It was also found that their ability to process glucose (sugar) in the blood had declined—in some

cases, to the level of diabetics. The researchers looked at two hormones, leptin and ghrelin, that are regulated by sleep and influence proper appetite. Leptin lets the brain know when your stomach is full, and ghrelin sends the message of hunger. When ghrelin was measured in the group that slept for four hours a night, the ratio of ghrelin jumped 71 per cent compared to when they were sleeping a full 10

hours.<sup>23</sup> No wonder they felt hungry and craved simple carbohydrates: their hunger hormone was switched on.

Since the psychological manifestations of fatigue, sleep and hunger are similar, adults sometimes confuse them. That's why people tend to eat when they're feeling really tired. Fatigue is often misinterpreted as hunger.

The Nurses' Health Study followed more than 68,000 women for 16 years, monitoring their weight, sleeping habits and diet. At the start of the study, all of the women were healthy and none was obese. By the end of the study, women who slept *five* hours a night were 32 per cent more likely to experience major weight gain—defined as an increase of 33 pounds [14.85 kg] or more—and 15 per cent more likely to become obese, compared with women who slept *seven* hours. And

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women who slept for six hours were 12 per cent more likely to experience major weight gain and six per cent more likely to become obese over the study period, compared with women who slept seven hours a night.<sup>24</sup>

These results have been reinforced by other studies. For example, researchers at the University of Warwick reviewed data from more than 28,000 children and more than 15,000 adults and found that sleep deprivation almost doubled the risk of obesity for children and adults.<sup>25</sup>

Brain scans of people who have fewer than seven hours of sleep a night show lower activity in the prefrontal cortex, the area of the brain that is involved in impulse control, planning, judgement and follow-through. Decreased activity in this part of the brain leads to greater impulsivity and more self-defeating decisions. It also means it's much more difficult to stick to any plan successfully, especially a weight loss program.

The relationship between obesity and sleep is not just an adult problem. Since 1992, 13 studies of more than 45,000 children have supported the inverse relationship between hours of sleep and risk of obesity. If children sleep less, they are more at risk of becoming obese. Short sleep duration at age 30 months is predictive of obesity at the age of seven years.<sup>26</sup>

Less than seven hours of sleep per night may permanently impair the part of the brain called the hypothalamus, which regulates both appetite and energy expenditure.

### **A Word about the Hypothalamus**

The hypothalamus is located at the centre of the brain and is the interface between the central nervous system and the endocrine system. It controls many automatic functions and coordinates metabolic activity throughout the 20 trillion cells that make up the human body. In addition, it organises and controls moods, cravings, sleep, endocrine function, hunger, appetite and food intake. Most importantly, the hypothalamus is the part of the brain that controls fat-burning and energy expenditure.

In the 1940s, the brilliant English endocrinologist Dr A. T. W. Simeons developed a revolutionary protocol to address the cause of the obesity problem (see my article in NEXUS 17/04). This new paradigm focused on re-establishing homeostasis to the hypothalamus, which he believed was dysfunctional in all overweight people. He created a unique protocol that re-established a properly functioning hypothalamus and also helped people safely lose up to 0.5 kilograms a day of toxic fat.

(To learn more about the Simeons protocol, visit the websites [www.fatlossaustralia.com.au](http://www.fatlossaustralia.com.au) or [www.ultimatefatloss.com](http://www.ultimatefatloss.com).)

To support deep and regenerative sleep, the following supplements and natural approaches are helpful: melatonin, chamomile, valerian, kava, passionflower, hops, L-theanine, GABA (gamma-aminobutyric acid), 5-HTP (5-hydroxytryptophan), vitamin B complex, phosphatidylserine and magnesium.

If you're taking prescription sleep medications, be cautious: all of them have serious side effects.

### **Some Gut Flora Can Make You Fat**

It was once thought that we are what we eat. But, to be more accurate, we are what we digest and assimilate. The latest research now tells us that, to be even more correct, we are what digests and assimilates our food. It

all has to do with the thriving population of the 100 trillion life-promoting bacteria that take up residence within our digestive tract from the moment of birth.

More than 99 per cent of microbes living in our intestinal tract comprise a very diverse group of bacteria, numbering between 500 to 1,000 different species. In a healthy person, these bacteria live in the gut in a balanced ecosystem, with

each species inhabiting its appropriate place. However, with the introduction of antibiotics, steroids and birth-control pills, that delicate balance is radically altered—and so is one's health.

And now, one more adverse health condition, caused by an overgrowth of harmful gut flora, can be added to the list: obesity.

There is a distinctive change in the intestinal microbial populations found in obese and lean humans and mice. Obese mice have different microbes in their gut than do lean mice. Obese humans have different gut microbes than do lean (or even dieting) humans. There is a strong connection between what we eat, how much we eat, and the species of bacteria that inhabit the intestinal tract.

The bacteria in the gut of obese mice are more efficient in processing carbohydrates. Thus, obese mice get a bigger "bang for the chow", ingesting calories from food that in lean mice would normally go unprocessed. So, fat mice get even fatter.<sup>27</sup>

Obese people have a distinctive mix of bacteria in their digestive system that also seem to make them prone to gaining weight. They have more digestive microbes that are especially efficient at extracting calories from food. Also, the greater the proportion of these super-digesting organisms, the more that people

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gain weight. When scientists transplanted these bacteria from obese mice into lean mice, the thin animals started to get fatter.

There appears to be a causal link between obesity and the type of microflora that inhabit the intestines. The difference in the structure of the microbial ecology of our digestive tract may create greater susceptibility to obesity. Our western diet, rich in fat and sugar, packs a double whammy to people's expanding girth. As well as providing more calories than we can burn through exercise, junk food encourages the growth of the gut bacteria that process food more efficiently, adding further to this energy excess.

Scientists took mice raised in a germ-free environment—mice which had no native gut bacteria of their own—and transplanted human intestinal bacteria into their digestive tracts. When these "humanised" mice were placed on a high-fat, high-sugar diet designed to mimic those common in western societies, the contents of their gut bacteria changed drastically, literally overnight. Switching from a low-fat, plant polysaccharide-rich diet to a high-fat, high-sugar, "western" diet shifted the structure of the gut microflora within a single day. The mice showed an increase in types of bacteria linked to obesity and also increased their body fat. The researchers then transplanted microbes from the intestines of these mice into other germ-free mice. These animals also put on weight, even when fed a low-fat diet.<sup>28</sup>

Another intriguing revelation has been the obesity-gut connection. When an organism is out of balance, the imbalance is reflected everywhere. Obese people have altered intestinal flora which predispose them to being obese. Junk food diets alter healthy gut flora, resulting in more obese tendencies.

Your food choices have an instantaneous effect on the balance of gut flora. Feed your digestive system healthy, nutritious food and you will be adding yet another successful piece to your weight loss puzzle. You can also add probiotic supplements to help support and enhance healthy intestinal flora.

### Solving the Puzzle

With more than one billion overweight adults who are part of the global community and at least 300 million obese adults, the world is facing an unparalleled obesity epidemic. To help rescue a world drowning in fat, it is necessary to embrace new paradigms. It is a problem that requires many new perspectives and an integrated approach.

Maintaining a healthy brain, ensuring optimal vitamin

D levels, committing to regenerative sleep and supporting the growth of healthy intestinal flora are some of the new pieces that are helping to solve the weight loss puzzle. ∞

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