

Promoting Homeostasis To Avoid Rebound Weight Gain In Yo-Yo Dieters

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Abstract

Rebound weight gain is more often the rule than the exception and the reason may not be lack of willpower. Recent findings in the study of weight homeostasis have uncovered a host of orexigenic and anorexigenic hormones working to keep a stable healthy weight. When energy stores are depleted through dieting, overcompensation to replenish them often occurs. Overeating is one of the homeostatic responses. However, there are other involuntary responses to hunger that lower metabolism, reduce thyroid hormones, and produce fat cells. Traditional weight control advice to cut down on caloric intake may inadvertently trigger the compensatory mechanism that lead to rebound weight and yo-yo dieting. Tuning into homeostatic cues to prevent excessive hunger without getting too full is the hallmark of intuitive eating. Tips are given on how to eat intuitively in order to promote homeostasis. Supporting homeostasis will help keep weight stable and prevent weight cycling and rebound weight gain that often accompanies dieting.

WEIGHT CYCLING THE RESULT OF DIETING

Cyclic weight gain and loss (yo-yo dieting) is a common problem with potentially more negative health effects than overt obesity.^{1, 2, 3,4} The phenomenon of weight gain after weight loss is more common than keeping the weight off after a weight loss plan.^{5,6} The weight regain that often occurs may in part be responsible for the excess weight plaguing much of the developed and developing world.^{7,8} The dual existence of record numbers of dieters, and overweight individuals may not be the paradox it appears.^{9,10,11,12} Physiologic research is now uncovering reasons why the more most of these individuals diet the heavier they become. As health care providers concerned with the health of patients, advanced practice nurses (APN) might want to examine the standard for patient education around weight control.¹³ In light of two decades of discoveries in the field of weight homeostasis, the upshot appears to be that cutting down and eating less may be at the root of much yo-yo dieting and the excess weight seen in chronic dieters.¹⁴ This paper will examine the wisdom of this advice in light of the effects hunger has on the complex system of weight homeostasis. Finally, a step-by-step alternative that providers can give patients will be provided.

PATIENT

A 42-year female patient presented to the clinic for a routine

physical. After her blood pressure and weight were taken, before beginning the history, the APN noted that the patient's weight had increased 43 pounds since her last appointment 2 years ago, putting her at a body mass index (BMI) of 30. In the 8 years that this patient had been coming to the clinic, she had gained and lost the same 40–50 pounds three times, and in fact, she was almost 20 pounds heavier than she was before her first appointment. The provider was unsure how to proceed. This patient always vowed to lose weight, often succeeded, only to gain the weight back again months or years later.

WEIGHT HOMEOSTASIS RESISTS WEIGHT LOSS

Not Willpower

When patients present appointment after appointment with excess weight despite health care advice, both patients and providers can be frustrated. This frustration is often intensified when the patient has other comorbid disorders like diabetes and hypertension. However, for patients who are becoming yo-yo dieters, it may not be a “loss of will power” that is keeping them heavy. Recent physiologic studies indicate that rebound weight gain may have little to do with weak resolve and more to do with homeostasis of energy (weight homeostasis).^{15, 16, 17, 18} This rebound weight gain what happens with energy homeostasis and

diating. The human body is confronted with a loss of energy (diating). That loss of energy is perceived by homeostatic processes as a disturbance which is then responded to as a threat. Perhaps because loss of weight can be deadly faster than weight gain, homeostasis tends to err on the side of resisting “starvation” over the promotion of weight loss.¹⁹

Weight Homeostasis 101

Homeostasis is a well-known topic for health care providers. When pH balance rises, respirations automatically increase to rid the body of bicarbonate ions. However, the restoration to a normal level could also occur voluntarily. For example, in the critical care unit when pH drops, a patient is sometimes given bicarbonate. If a patient is cold, shivering may ensue involuntarily. At the same time, warmed blankets can be provided. In each of these cases automatic and voluntary ways are available to restore homeostasis. As an example of energy homeostasis, when calories are withheld to the point of hunger, the body becomes flooded with hunger hormones.²⁰ The hungry individual is spurred to eat, and thus eats a lot.²¹ Eating in response to hunger is a voluntary way to replenish lost energy stores. However, the body has a built-in way to involuntarily stop further loss of energy. The complex cascade of homeostatic biochemicals produces fat cells²², decreases resting energy metabolism²³, decreases thermogenesis, and decreases thyroid secretion.²⁴ These processes are all automatic ways to restore lost energy.

Many biochemicals are involved in energy homeostasis. Some are secreted when hunger arises and are termed orexigenic, and some work to create a feeling of fullness and are thus termed anorexigenic. The most common orexigenic hormones are the gut hormone ghrelin²⁵ and neuropeptide Y²⁶. Peptide YY (PYY), a gut hormone, and leptin, a hormone produced by fat cells are anorexigenic hormones.^{17, 27} These substances are just some of the peptides, proteins, and hormones that will reduce the loss of energy automatically, despite the desire of the dieting individual.

Weight Homeostasis Errs on the Side of Preventing Weight Loss

To understand the uniqueness of weight homeostasis, it is important to note that unlike pH and temperature, where either too high or too low levels are equally dangerous, sudden or rapid weight loss is more immediately dangerous than weight gain. Throughout human history, survival

depended on maintaining adequate weight, which sometimes meant the body adapted to changing conditions through erring on the side of preventing weight loss when extreme energy loss is threatened²⁸.

Simply starting an infusion of an anorexigenic agent like PYY to create a feeling of satiety and avoid overeating is not an option. Due to the principles of weight homeostasis that prioritize preventing starvation, an infusion of PYY (the peptide that turns off the desire to eat) only has a short-term effect. To prevent weight loss, the body develops a tolerance to the peptide over time.²⁷ Likewise, leptin, the long-term satiety hormone might cause a decrease in appetite in the beginning of weight gain, but resistance soon develops and appetite returns to pre-weight gain levels.^{29, 30}

Supporting the bias in favor of maintaining weight for survival, no such tolerance is found with the hunger hormones.^{31, 32} As a result, high levels of neuropeptide Y and ghrelin continue to stimulate feelings of hunger indefinitely.²⁶ To further reduce the loss of energy, high ghrelin levels not only create fat, increase appetite and food intake, as mentioned previously, they prevent the loss of energy by decreasing thyroid function and decreasing thermogenesis.^{33,34,35}

A POSSIBLE SOLUTION

Both providers and patients who are yo-yo dieters would do well to focus on promoting homeostasis rather than trying to overcome it. Despite the human body being hardwired to resist starvation, it is also programmed to keep body weight within a healthy range. Evidence can be found in the fact that anorexigenic gut hormones outnumber orexigenic hormones 5 to 1.³⁶ Eating 3 meals a day in response to metabolic hunger, supports homeostasis.^{37, 38} Skipping a meal and not eating for a long period of time increases ghrelin levels and leads to extra weight.³⁹ The other extreme eating behavior, regular overeating, will also increase weight and create the same tolerance that a constant infusion of peptide YY would have.⁴⁰ Eventually, despite extra weight, the individual will eat as much as before the weight was put on.⁴¹ The key is to prevent threatening the homeostatic system by getting too hungry or depleting energy stores. As long as homeostasis is not profoundly or constantly disturbed, by either ignoring fullness and overeating, or ignoring hunger and under-eating, an even, healthy weight will be the result. The way to achieve a healthy weight is to eat when hungry and stop eating when full.

How to Tune into Metabolic Hunger and Fullness

One of the problems facing chronic dieters is that they do not know when they are ideally hungry. Hunger has been the enemy for so long that they have “turned off” the hunger signal. If a chronic dieter has this problem they may be helped by following tips in Table 1.

Table 1a
Tips to Help Your Patients Eat Healthier

<ul style="list-style-type: none">• <i>Say YES to giving your body the amount and type of food to be healthy</i> The benefit of eating intuitively allows people to eat with a positive attitude. Instead of musing, “Oh no, I shouldn’t eat because I’m so fat”, the approach is positive, “I’m hungry, I should eat until I’m satisfied”. When full tell yourself “I have had enough”. Intuitive or homeostatic eating entails several key practices.• <i>Key practices of ideal/intuitive eating</i><ol style="list-style-type: none">1. Begin a meal or snack when IDEALLY hungry. Ideally meaning nice and hungry without hunger pangs or a rumblings.2. Eat until IDEALLY satisfied. Ideally satisfied means you will not be hungry again for 4-6 hours, and have not gotten too full, or “stuffed”.3. Choosing what your body is craving from your favorite foods that are both delicious and healthy• <i>How to know when you are hungry</i> <u>The cold water test</u><ul style="list-style-type: none">➢ 4.5 to 5 hours after eating a meal drink a cold glass of water➢ If you feel it coat the bottom of your stomach you are ideally hungry

Table 1b
Tips to Help Your Patients Eat Healthier

<ul style="list-style-type: none">• <i>How to know when you are full</i> <u>Taste experiment</u><ul style="list-style-type: none">➢ When you become ideally hungry, provide yourself with a fist sized portion of delicious, healthy food➢ Close your eyes and notice flavors as you eat your portion➢ Stop and wait 10 minutes➢ Put another bite of the same food in your mouth. Notice the flavors again - if the food does not taste as good this time as it did when you began, you are probably full• <i>Get some help</i><ul style="list-style-type: none">➢ There are many books and programs out there to help people eat intuitively, from Geneen Roth⁴² to the Gabriel Method⁴³ reference, to the new iPhone App, ‘Leat’ (IWC, for Intuitive Weight Control). These resources explain the reasons to eat intuitively, what to expect when you go from dieting to eating intuitively, and give you tools to help you nail every meal eating exactly what your body needs; no more, no less.➢ Instead of counting calories or keeping a food journal, keep a hunger/ fullness log, noting how hungry you are when you begin each meal or snack and how full you get when you stop.➢ Find a group to support you in your life style change and an activity you enjoy doing

HOW INTUITIVE EATING HELPED THE PATIENT

Finding Out What She Was Doing Wrong

After several months of attempting to eat intuitively and keeping a log, the patient realized she ate all of her daytime meals extremely hungry and without getting full enough. She would eat a very small breakfast and lunch, then nothing until dinner. The sparse eating pattern put her body into starvation mode and resulted in such fierce hunger signals that she was famished by dinner. Her hunger level impelled her to eat too much at dinner and continue eating throughout the evening. In reviewing her food log with a nutritional consultant, the patient saw her issue was not a lack of willpower that led to over eating, but was her body’s cascade of chemicals helping her not starve to death. In her very empty stomach throughout the day, the hunger hormone ghrelin was being pumped out by gastric cells and causing levels to soar. The desire to eat was chemical⁴⁴, something she could not control but could prevent.

Resetting the Body’s Signals

Once the patient started eating a healthy breakfast when she got hungry, and doing the same at lunch, over eating at dinner and throughout the evening started to be less of a problem. Because she now responds to her hunger hormones and eats proportionately, her total food

consumption is less.

CONCLUSION - SIMPLE BUT NOT EASY

Intuitive eating is simpler than counting calories but may be difficult for the chronic dieter.⁴⁴ A person who starts practicing intuitive eating is encouraged to tune in to hunger feelings instead of tuning them out.⁴⁵ Intuitive eating helps chronic dieters change their tuning out behavior and notice when they are ideally hungry. It is healthy to eat when hungry.⁴⁶ The complex mechanism of weight homeostasis is preprogrammed to ensure our bodies have a certain amount of weight.²⁸ Eating just enough to be satisfied is the antidote to hunger and excess weight. The key is to stop eating when ideally full. The exact amount of food and the frequency and timing of meals will vary from person to person. Giving patients permission to eat when hungry and stop eating when full will not only break the cycle of yo-yo dieting, but will help patients make peace with themselves, and help providers make peace with their patients.⁴⁷

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