part one

The Journey Begins

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Family Genes

Who is to blame for your family's weight struggles? The common perception is that if you or your loved ones are overweight, it's because you're lazy and weak willed, and if you simply got up off the couch and pushed yourself away from the dinner table, you'd lose weight and be fit once and for all. There's no doubt that individual food choices and physical activity habits have a great impact on how much you weigh. But our environment makes it more difficult than ever to maintain a healthy body weight and a high level of physical fitness. First, there is the abundance of readily available, highly palatable, heavily advertised high-calorie and high-fat food to entice us. Second, we move our bodies less and less because technology has given us personal data assistants, cell phones, and remote controls so we don't have to get up to change TV channels. Now there are even vacuum cleaners that work without us pushing them.

The Gene-Body Connection

Although eating more and moving less may contribute to many weight woes, that's only part of the story, especially for families in which being overweight or obese is passed down from generation to generation. Jeffrey Friedman, M.D., Ph.D., director of the Laboratory of Molecular

Genetics at Rockefeller University, in his research on why we become overweight, says that genes play as big a role in determining how much we weigh as they do in determining our height. At least 430 genes—the carriers of heredity—that play a part in obesity have been identified by Friedman and other scientists. In fact, an emerging field, nutrigenomics, studies how genes determine our nutritional requirements and how food components interact with our genes and influence our risks for disease and other outcomes.

Genes have been found to play a part in:

- Individual nutrient needs
- Digestion of certain foods
- Susceptibility to diseases
- Susceptibility to eating disorders (such as anorexia)
- Food preferences
- Metabolism
- Response to certain foods and activities
- Desire to eat and stop eating
- Ability to keep weight off once it's lost

Our bodies are shaped by our genes. I am short and pear shaped, just like my mother. When I was a child and young adult, my mom's mother, my mom, and I used to show off how we were three generations and had the same hands and long rock-hard fingernails. Although pretty hands and nails were certainly desirable traits Nana passed on to my mother and me, that's not all that was passed on to us. My mom's dad passed on to my mother and me big thighs, a trait that plagued many of my grandfather's siblings, even the men (you win some, you lose some). As in my family, having a particular body shape, having excess fat where you don't want it, and being overweight are characteristics that many families pass down, generation after generation, because of a combination of genes and environmental factors.

The good news is that having a genetic predisposition to being overweight does not mean that if you are already overweight, you won't or can't lose at least some weight to improve your health. It does not mean your children will inevitably gain unhealthy amounts of weight as they get older. It does mean, however, that it may be more difficult or more challenging for you and your family to achieve and maintain what you consider to be ideal body weights. Both my mother and I

battled and subsequently beat the bulge, although we did not, by any means, become model-thin. My mother lost more than 100 pounds by eating smaller portions and becoming more active (she loves water aerobics and other classes). She has kept her weight off for more than twenty-five years. Although she would like to be thinner and have less body fat and a more toned appearance, she understands that her body is comfortable at her current weight. She goes up and down about 5 pounds, eats well, stays as active as she can (she suffers from phlebitis, a blood clotting condition that from time to time limits her mobility), and still has the prettiest nails and hands of anyone I've ever known.

As for me, I currently weigh 115 to 117 pounds—what I considered ideal when I was an overweight fifteen-year-old girl. I have lost a total of about 30 pounds since high school, when I topped off at 145 pounds, and have kept off all the weight for about ten years. I achieved my weight loss simply by reducing my portions, eating more healthful foods like vegetables, and increasing my physical activity—power walking and tap dancing are my favorite pursuits. Although I, too, would like to weigh 5 pounds less just to look better in a bathing suit, I know that I'd have to make too many sacrifices to lose any more weight. That nighttime Oreo cookie? Gone. The small handful of Hershey Kisses midday? No more. And forget about that pat of butter on my bread at my favorite restaurant. So although I'd love to weigh less just to look better for myself (my husband loves me just the way I am, so he says!), I know I am unwilling to make any more dietary cutbacks. I try to always remind myself that I was able to lose weight and keep it off and have two kids in the process simply by reducing portion sizes and adding more fitness into my daily routine. My goal now is to maintain my current weight and build more muscle mass through strength training. And what about my other family members? My brother still struggles with obesity, and my father, who is a few pounds overweight, eats well but tends to go overboard on portions, and he seems content to go up and down losing and gaining the same 5 or 10 pounds.

Fortunately, you and your family can do a lot each day to improve your eating and fitness habits and reap many benefits in terms of your overall health, body weight, and appearance. This chapter will help you take a close look at your personal and family histories as well as family patterns that relate to body weight. It will show you that even though you belong to the same family, each member has a varied genetic makeup and will respond in a unique way to any changes made in food choices or fitness habits. With help from this book, you and

your family will learn how to set realistic food- and fitness-related goals and create personalized lifelong eating and fitness patterns.

Take Paul, for instance, a thirty-four-year-old father of two small girls, ages four and two. He has two overweight parents. Paul's maternal grandparents both lived well into their nineties, despite the fact that his grandmother was overweight and had type 2 diabetes most of her adult life. Paul's mom, in her sixties, is apple shaped (see the box "Apples versus Pears" on page 15) and has been about 20 pounds overweight since her thirties, after having two children. Even though she takes medication to control her blood pressure and cholesterol levels, she puts salt on everything she eats and clears her plate at every meal. She also does little physical activity. Early in life, Paul's paternal grandfather was diagnosed with type 2 diabetes that eventually caused him to become blind. He died of a heart attack in his late seventies. Paul's dad, now in his early seventies, also developed type 2 diabetes as an adult. When he was initially diagnosed more than a decade ago, he lost some weight but subsequently gained most of it back. He's about 20 pounds overweight and takes medication twice daily to control his blood sugar. Like his wife, he clears his plate, avoids sugar like the plague, and is inactive except for some walking.

Is Paul doomed to follow in his family's genetic footsteps? No, because he is aware of his family history and is determined to change his weight and his ways. His weight was 162 pounds on his five foot eight frame just after college, when he worked 100 hours a week, ate mostly takeout, and did very little physical activity. Over the next few years, he took up running and his weight leveled off in the low 150s. He ran three marathons, and during his training his weight dipped to 152 pounds. Over the last six years or so, since he and his wife had two girls, his physical activity has diminished considerably. His weight hit the upper 150s, and after several borderline high cholesterol readings, and given his family history of diabetes and high blood pressure, he decided to be proactive and make some changes. He kept a food record for three days (see page 22) and also filled out a physical activity form (see page 28). He makes sure to choose oatmeal or whole-grain cereal with low-fat milk and fruit for breakfast instead of his usual bagel with cream cheese. Rather than snacking mid-morning on sugary foods like breakfast bars, he usually has low-fat yogurt and nuts. He eats what he likes but limits animal foods with a lot of saturated fat like red meat and cheese. He goes to the gym four or five mornings per week, where he runs and lifts weights. He has maintained

his weight at approximately 150 pounds for about two years. At a recent physical, his internist complimented him on his good physical condition.

What about the Influence of Family Culture?

Marie was a busy young mother with three small children. Although she had always been overweight, she gained even more weight with each successive pregnancy. Her mother, father, and sisters and brothers—there were a lot of them—were all obese. Growing up in a home in which it was expected that all family members would clean their plates, which was not so hard to do because the food their mother cooked was fatty and delicious, no doubt contributed to Marie and her siblings subsequently becoming overweight. As an adult, Marie became a cook just like her mother, and she felt like a failure if her husband and children didn't clean their plates after she slaved, however willingly, over a hot stove. Marie put so much effort into food shopping and meal preparation, not to mention juggling three kids' schedules, that she had little time to exercise. The only real physical activity she got was chasing after her children.

Marie seemed destined to continue to balloon in weight until we worked together. First, we identified her family's genetic and emotional history as well as their cultural tastes. We documented her current eating patterns (see sample food record on page 22) and uncovered situations that prompted her to overeat. She discovered that she would turn to food in response to visual cues such as TV ads and/or aromatic triggers such as the smell of cinnamon muffins at the mall. We discussed her daily schedule for both weekdays and weekends and determined which times of the day were the toughest for her. For example, she often skipped breakfast during the hectic morning frenzy with her kids, and she constantly grazed on food while preparing dinner for her family. We also listed what she perceived to be obstacles that prevented her from preparing more nutritious meals, limiting portion sizes, and increasing daily physical activity.

We came up with several simple solutions that she then incorporated into her life—she woke up twenty minutes earlier than she usually did to prepare breakfast for her kids and herself, and she snacked on cut-up vegetables with a low-fat yogurt dip or hummus while

making dinner. We also discussed how important it was for her promote healthful patterns such as eating until you're comfortable and not pressuring her children and husband to finish everything on their plates. She has slowly but surely realized that even if her family does not eat all the food on their plates, it does not mean they don't enjoy the food she makes or that they love her less. Marie has also learned how to take a few minutes to stop and identify how she feels before she eats, and to eat because she's hungry, not because she feels bored, tired, happy, or upset, or because she sees tempting food.

Even though Marie will likely never be slim—she inherited a stocky, muscular build from her mother—she has lost 40 pounds, and has a pleasing, full figure. She takes pride in her looks, has more energy, and is healthy. She feels empowered to make more mindful decisions about food, nutrition, and physical activity, and she has a positive influence on her family.

How Much Do Lifestyle and Environment Combat Genetic Tendencies?

Amy's entire family—mother, father, and two sisters—were all thin. Amy had also been thin most of her life until she began pursuing a high-powered career in the financial industry. She got little sleep because she had to wake up at five each morning to check overseas markets on her computer. She always skipped breakfast. For lunch, she either went out to fancy restaurants with clients or ordered takeout and dined at her desk. She also mindlessly snacked all day on candy from other people's desks and from her own desk drawer. She worked long hours and never found time to exercise. Adding to her caloric intake, she would stop at a local bar after work to socialize and have a few drinks and many peanuts to unwind from the stress of the day.

First, I encouraged Amy to keep a three-day record of how she spent her time. Taking an objective look at how much time she spent on all her daily activities was a real wake-up call for Amy. We came up with some realistic, sensible steps she could take to increase her physical activity. She also kept a food record (see page 22) to give her a glimpse of her eating habits (she skipped breakfast often), what she was overdoing (candy at her colleagues' desks), and where she was falling short in terms of food groups. Amy now prepares a quick breakfast, and she brings nuts or some high-fiber cereal and a low-fat yogurt

packed on ice to have as a mid-morning snack at her desk. Instead of taking the elevator to her fifth-floor office, she takes the stairs. She gets up from her desk to talk to colleagues instead of communicating via e-mail. She also takes two or three ten- or fifteen-minute walk breaks at work. And three days a week, she packs a healthy desktop lunch that includes lean protein such as turkey, chicken breast, or tuna, grains such as whole-wheat crackers or multigrain bread, fresh fruit or cut-up vegetables with a low-fat yogurt dip, and skim milk or low-fat cheese. She even keeps preportioned snacks in her desk drawer—nuts, seeds, whole-grain crackers, and tubes of peanut butter. When she dines out with clients, she skips the bread and the drinks. She finds many of her dining companions are happy to do the same because they had felt obligated to join in the routine bread and drink even though they too were watching their caloric intake. Amy always orders some kind of vegetable or salad for an appetizer and eats half of her fish, lean beef, or chicken entrée.

Now, instead of spending time at the bar after work, Amy unwinds at a health club. She has found that socializing at the club is just as rewarding as it had been at the bar. Amy lost 25 pounds in six months. Her coworkers think it is just because she gave up eating their candy and don't realize the other changes Amy has made to achieve her weight loss.

So for Paul, Marie, and Amy, it was possible to make relatively small changes to get on the road to healthy eating and a healthy lifestyle despite their genetics and their past and present family food and activity habits. Like them, you too will learn how to create and maintain a weight management plan for yourself and your entire family that takes into account each family member's unique food and activity preferences and overall lifestyle.

A Reality Check for Your Family

Before you and your family make any changes at all in your eating or fitness habits, take a look at your entire family and where each of you is starting from in terms of your own body weight, shape, and size, and medical history. This will give you some insight about the impact of your genetic family history and what's realistic for you and family members in terms of your own body weight and shape goals.

You can use several simple tools to assess and evaluate your current body weight and shape that will help you set your weight-related goals

(see chapter 2): body mass index and measurements including waist circumference and frame size.

Body Mass Index and Frame Size

To see how your weight measures up, you can determine your body mass index (BMI) in appendix B and record your BMI on the form in appendix A. BMI measures your weight in relation to your height and is a reliable indicator for determining how much body fat you have. But even though BMI is useful, it is not foolproof. It may overestimate body fat in those who are very muscular and it may underestimate body fat levels in older people who lose muscle mass with age.

In addition to BMI, knowing where excess body fat is located on the body also provides a window for potential health risks. If you carry fat mainly around your waist, you are more likely to develop health problems than if you carry fat mainly in your hips and thighs. This is true even if your BMI falls within the normal range.

Take Out Your Tape Measure

Another tool you can use is an old-fashioned tape measure. With it, you can easily measure your waist circumference. This is useful for both adults and children. The wider the waist (the more fat you have around your middle), the higher the risk for many diet-related ills including cardiovascular disease, high blood pressure, type 2 diabetes, and other obesity-related conditions. See the box "Apples versus Pears" on page 15 to see what shape you are.

To measure your waist circumference, place a tape measure around your bare abdomen just above the hip bone. Be sure the tape is snug but does not compress the skin and is parallel to the floor. Relax and exhale, and then measure the waist (record this measurement in inches in the chart in appendix A). If you would feel more comfortable, ask your doctor or another health professional to help you take this measurement. Women with a waist measurement of more than 35 inches or men with a waist measurement of more than 40 inches may have a higher disease risk than people with smaller waist measurements because of where their fat is located.

Using a tape measure periodically to keep track of your waist size is a great way to determine how you're doing in terms of body fat level and body fat distribution. Even in young children and adolescents,

Apples versus Pears: What Shape Are You?

Did you know that not all body fat is created equal? Even if, like me, you're plagued with hips and thighs you wish were smaller—your body is pear shaped (it's smaller on top and bigger on the bottom)—that extra bit of padding may actually be a blessing in disguise and is associated with reduced health risks compared with those with an apple shape. Recent studies suggest that excess hip and thigh fat may actually protect against cardiovascular disease and death, as well as metabolic syndrome. Why the benefits? One theory is the fat that accumulates in the lower body may act as a reservoir for harmful fats that would otherwise accumulate in the body. Or perhaps it could be that those who are genetically pear shaped are less likely to gain extra fat around their middles than those who are genetically shaped like an apple.

Having an apple shape (you have relatively thin arms and legs and when you gain weight, it tends to go straight to your gut) increases your risks for several diet-related diseases including heart disease, diabetes, hypertension, and metabolic syndrome as well as breathing problems, disability, some cancers, and a higher death rate. That's because belly fat, also known as visceral fat, surrounds internal organs and secretes powerful chemicals that can increase the risks for disease. The more belly fat, the greater the health risks. Many women tend to have a pear shape (but may develop more of an apple shape when they experience menopause), whereas men tend to be more apple shaped.

No matter what shape you are, you can improve your overall health by staying active and engaging in regular exercise such as walking or cycling, as well as weight training, making better food choices, and achieving and maintaining a healthier body weight.

Sources: B. H. Goodpaster et al., "Obesity, Regional Body Fat Distribution, and the Metabolic Syndrome in Older Men and Women," Archive of Internal Medicine *165, no. 7 (2005): 777–83; "Are you an Apple or a Pear?"* myDNA News*, reviewed by Rick Nauert Ph.D., American College of Cardiology, September 16, 2005.*

research suggests that increased upper body fat is associated with higher levels of blood fat, triglycerides, and lower high-density lipoprotein (HDL), the good cholesterol. Although there are no set standards that establish safe or healthy norms for waist circumference measurements in children, your pediatrician can certainly measure your child's

waist at yearly check-ups to see how it changes over time, and compare the measurements with values observed in children by researchers and published in the *Journal of Pediatrics* in 2004. If your child's waist circumference (measured at the end of the lowest most rib at the end of a normal expiration) falls above the ninetieth percentile for age and gender (see the table below), they are at significant risk for obesity-related diseases and conditions.

Frame Size: The Bones Your Ancestors Gave You

A tape measure can also help you determine your genetic bone structure and frame size. If you naturally have a larger frame—if you're big boned like Marie's entire family, including her parents and grandparents

Waist Circumference at the Ninetieth Percentile (in centimeters)

Age	Boys	Girls
2	50.8	52.2
3	54.2	55.3
4	57.6	58.3
5	61.0	61.4
6	64.4	64.4
7	67.8	67.5
8	71.2	70.5
9	74.6	73.6
10	78.0	76.6
11	81.4	79.7
12	84.8	82.7
13	88.2	85.8
14	91.6	88.8
15	95.0	91.9
16	98.4	94.9
17	101.8	98.0
18	105.2	101.0

Source: Adapted with permission from J.R. Fernandez et al., "Waist circumference percentiles in nationally representative samples of African-American, European-American, and Mexican-American children and adolescents," Journal of Pediatrics *145 (2004): 439–44.*

who emigrated from the same town in Italy—it's likely that you cannot weigh the same as a person with a smaller bone structure who is the same height as you. Knowing your frame size can help you and your family members set realistic weight-related goals (see chapter 2). Helping your children measure their frame size is a great way to teach them that we all come in different sizes and no matter what size we are, we can certainly take action to make our bodies stronger and more fit. To determine your frame size, see appendix C and record it on the chart in appendix A. Frame size measurements apply only to adults, though you can help your children measure their own wrists to show them how bone sizes vary from person to person, even within the same family.

Whether you have a small, medium, or large frame depends on bone structure and density. Men and women differ in frame size and people of the same gender may also differ. Genes determine about 40 to 80 percent of bone length and structure according to Stefan Judex, Ph.D., a researcher in the Department of Biomedical Research at the State University of New York at Stony Brook. The remaining fraction—20 to 60 percent—is determined by environmental factors including diet and exercise.

Although you can't do much to change the actual shape of your body, you can change the appearance of your body, muscle, and skin. Overweight or not, making simple dietary changes and increasing the frequency and types of physical activity in which you and your family engage can result in tremendous payoffs in terms of how you look and feel. Because excess abdominal fat increases health risks, it's especially important for those who accumulate weight in their abdominal area to be diligent to maintain a healthy body weight and prevent future weight gain. For example, Paul, who had a little extra weight in his midsection, started to run, which burns calories and helps shed body fat, and he began to weight train with a daily focus on his abdominal area. And although it was not one specific activity (for example, abdominal crunches) that led to the weight loss he achieved around his midsection, the combination of exercises, paired with eating more high-fiber carbohydrate-rich foods, lean protein, and fewer refined carbohydrates, is what helped get him into the good shape he is in today.

Take a look at some old pictures of your parents, grandparents, and great-grandparents, if possible. Chances are you can see your shape in an ancestor or two. For example, I am pear shaped like my mom; her mother was apple shaped. She was slim until her forties and fifties and then gained weight in her middle. In contrast, my mother's father, was

more pear shaped. He was always at a healthy weight, but his brothers and sisters were all quite bottom heavy and all had large thighs that, to some extent, were passed on to my mother and me, much to our chagrin. If you take a good look at all the body shapes in your family, you'll likely see some patterns. My husband and I have many friends with children who resemble them markedly. In our own family, our eight-year-old son, Spencer, is a virtual clone of my husband. He has the same exact body shape as his dad—from his lean arms and legs to his ears and his round bottom. Our four-year-old son, Eli, is more lean than his brother was at the same age, but he shares my hair color at the same age, eye color, and pinky toes.

Inherited Metabolism

Metabolism is the rate at which the body uses energy, or burns calories. The scientist Eric Ravussin of Pennington Biomedical Research Center, in Baton Rouge, Louisiana, has found that the basal metabolic rate—the number of calories we burn just to keep all our basic systems running—varies among us by as much as 500 calories a day. A low or high metabolism can run in families, which suggests genetic involvement in weight control. So yes, you inherit your basic metabolism, but many environmental and nutritional factors affect it, a number of which you can control.

Your hormones, the products of your endocrine glands, are major players in your metabolism. They are the chemical messengers that regulate your body processes and bone structure. Hormones are also important contributors to the shape you are in—inside and out. Excesses or deficits of hormones can lead to obesity. The endocrine system has a basis in heredity, but family eating habits and emotions affect hormonal secretions. If there are conflicts and other stresses in a family, for example, members' adrenal glands can secrete hormones that lead to fluid retention. Women are particularly susceptible to this phenomenon because of their naturally fluctuating hormone levels (see chapter 7 for more about the nutrition needs of women).

No matter what genes you inherited, the ideas and information in this book can benefit both you and your family. Although genetics certainly contribute to your family's various body shapes, many environmental factors influence your body weight and overall lifestyle. It may not be possible for you to change your inherited body structure, but

once you take a good look at your own body weight, shape, frame, and medical history and how it relates to members of your entire family, you'll be in a better position to set realistic food and fitness goals (see chapters 2 and 3), make changes in your daily eating and fitness habits, and encourage your family members to do the same in ways that work within their own unique lives.