



Emily's closet



Kevin's closet



Mom's closet



Dad's closet

THE KIDS ARE NOT ALRIGHT

BY CHUCK STARESINIC

# AMERICA XL

**W**hen Caitlin Kelly was 14, her mother took her shopping in the men's section of a popular department store, because women's clothes were shaped all wrong for this very tall, very heavy girl. Caitlin hated shopping there. She wore a 38-inch waist in men's jeans and shorts. Sometimes, even those clothes were tight. She wore extra-large T-shirts. She favored the "layered look," draping a long-sleeve flannel shirt over her frame and leaving her shirrtails swinging about to mask her shape. She weighed approximately 210 pounds when she started eighth grade.

Now our kids are overweight, too. Obesity in children and adolescents is likely to damage self-image and self-esteem; the medical consequences can be even more grave.

ILLUSTRATIONS | JULIETTE BORDA

There are more and more children like Caitlin in America these days. The percentage of American children who are overweight has increased two-and-a-half times in 20 years. It is much more than a cosmetic problem. Overweight children are at risk of developing a host of medical conditions that can reduce the quality and length of their lives. Some reach puberty and quickly learn that they may grow up to be infertile. Others graduate from high school burdened with a physique that puts them at risk of dying younger than their parents, as though the medical advances of the past few decades were all for naught.

Although unique in its particulars, Caitlin's story reveals important details about the effect that weight problems have on children; why parents and doctors have to recognize obesity as a medical problem early on; and how to go about treating the problem if children like Caitlin are to have any hope of experiencing a normal, healthy adulthood.

Caitlin is 18 years old now, entering her sophomore year at a small state university in West Virginia. It's only a 30-minute drive from the semirural outskirts of the town where she lives with her parents. She talks like an adolescent who is a bit uncomfortable being singled out, haltingly and even mumbling at times. She is a thoughtful

young woman who'd been somewhat ostracized and introverted as a child. She was homeschooled for three years before she decided to attend eighth grade at a small Christian school. Being 14 and overweight at a new school is a vivid memory for her. She was painfully aware that she was bigger than everyone else, and she was frequently teased about her weight.

Caitlin had only two friends at that school, and neither was in her grade. Sometimes it was hard just to get through the day. She says she sometimes felt ashamed of the way she

was, even though she "knew it wasn't bad."

Caitlin stood out in other ways. Since age 5, she'd had terrible allergies to food coloring, the preservatives in store-bought meat, and other ingredients commonly found in the American diet. She rarely ate the same things as the other kids. Her mother would chaperone school field trips to make sure Caitlin's diet was accommodated. She ate a lot of bread and pasta and potatoes. She was out sick more than most kids, and she was almost always low on energy. Physical activity was a challenge, and she was more likely to read a book than exercise.

## Some diabetic teenagers are developing the cardiovascular systems of 60-year-olds.

"I didn't do too much in gym class or anything," Caitlin says, "because my ankles were weak back then. I had sprained my ankle just, like, walking down the road or something."

According to Caitlin's mother, Ruth Kelly, even the teachers had a difficult time accepting it when Caitlin didn't feel well or missed class. With little support outside of the home, it was a tough year at school.

"By the end of that year, I had pretty much starved myself and lost about 30 or 40 pounds because of the way I was treated, and the way it made me feel," Caitlin states plainly, betraying no emotion. She dropped down to one meal a day, if that. At the start of the year, she could eat a foot-long sub in one sitting and still be hungry. She could sit down with a large bag of potato chips and eat the whole thing. By the end of the

year, she wouldn't finish a six-inch sub. But Caitlin's crash diet was hardly the solution to her weight problem. Her energy was as low as ever, and when she returned to her normal eating habits that summer, she quickly gained the weight back.

Ruth Kelly knew something was really wrong when Caitlin went five straight months without menstruating, then suddenly had two periods in two weeks. She must have asked half the women she knew to recommend a good gynecologist. She made scores of telephone calls and, finally, an appointment with a specialist in Morgantown, W. Va. She took Caitlin there and, as she recalls it, told the doctor, "I am not here as the mother of a young child to get her put on birth control pills. We don't want that. I do understand that this is one of the treatments. I know that's one of the things they do for irregularity, but I want testing done. I want to know what's going on."

The doctor ordered blood work, and he performed an ultrasound of Caitlin's reproductive organs. There were two highly suggestive findings: Caitlin had high insulin levels in her blood (meaning she was probably becoming resistant to her own insulin) and many large cysts on her ovaries. He referred her to a pediatric endocrinologist at Children's Hospital of Pittsburgh, whom he knew to be working on hormonal abnormalities in adolescent girls.

Silva Arslanian (Fel '84) became a pediatrician when the obesity epidemic

## WHAT EVERY PEDIATRICIAN CAN DO

At Children's Hospital of Pittsburgh, there is a team of nutritionists, exercise physiologists, counselors, and physicians available to work with the families of overweight children. But what about the doctors who don't have such extensive resources? Silva Arslanian, director of the Center for Pediatric Weight Management and Wellness, advises family physicians and pediatricians how to address weight problems among kids:

- Always calculate body mass index. Only height, weight, and age are required to tell whether a child is overweight or at risk.
- If a child has a weight problem, then spend at least 10 or 15 minutes with the child and parent discussing healthy nutrition and physical activity.
- Explain that this is a problem connected to the environment in which the child lives. To fix it, parents must be committed, and they must be role models. In other words, the person who shops for and prepares food for the family is as responsible as the child who eats it.
- Schedule a follow-up visit.

—CS

was barely a blip on the horizon. She attended medical school and completed her pediatric residency at the American University of Beirut in Lebanon. In 1980, she came to the University of Pittsburgh and Children's Hospital of Pittsburgh for a fellowship in pediatric endocrinology. Today, she's a Pitt professor of pediatrics.

Arslanian found that Caitlin was suffering from more than insulin resistance and excess weight. She sat down with the mother and daughter and described how many of Caitlin's seemingly unrelated symptoms were linked under a condition known as PCOS—polycystic ovarian syndrome.

PCOS is the most common endocrine disorder in women of reproductive age. According to the National Institutes of Health, it affects 5 to 10 percent of American women. Many women's health researchers believe that is a conservative estimate and that lots of women go undiagnosed. In addition to Caitlin's symptoms of insulin resistance, obesity, and irregular menstruation, PCOS is marked by acne and excessive facial or body hair. The ovaries of women with PCOS produce more testosterone than needed and are filled with benign cysts that interfere with ovulation and make it difficult to conceive.

The link between obesity and PCOS is well documented, says Arslanian. The majority of adolescents and adults with PCOS are obese. There are genetic risk factors, but she suggests that obesity is often responsible for bringing the symptoms to the surface and intensifying them. PCOS is characterized by high levels of insulin, which is a potent growth factor that causes multiple cell systems, including fat cells, to accelerate growth—so women with high insulin are predisposed to weight gain. Excess weight promotes insulin resistance, and the cycle feeds itself.

It was a sobering diagnosis for a 210-pound, 14-year-old girl to hear. Caitlin said very little in the doctor's office that day, but she appreciated the fact that Arslanian was frank and open. The doctor talked directly to her instead of just speaking to her mother. She told Caitlin that she was at risk of losing the ability to conceive a child unless she changed her lifestyle and worked to correct the hormonal imbalance. She would be given metformin, an oral drug that would alleviate her insulin resistance and lower her blood sugar, but if she did not make changes in her

diet and physical activity, her insulin resistance and ovarian cysts would probably not go away. She might develop type 2 diabetes. She had to begin by drastically reducing the carbohydrates in her diet, including bread, potatoes, pasta, and sugary sodas and juices.

Arslanian says that PCOS is not directly related to diet, but if an adolescent like Caitlin loses 20 to 30 pounds, depending on how overweight she is, there is a good chance the hormonal abnormality will get better and the menstrual cycle will become more normal.

In the car on the way back to West Virginia, Caitlin cried over changing her diet again. *What was left for her to eat?* she asked her mother. Ruth Kelly chokes up when she tells this story. "A child that age is picky," she says now, laughing away her tears, adding that Caitlin always did love potatoes.

"For me it was a relief," Ruth Kelly says of her daughter's diagnosis, "because I had an answer. Now I just had a new direction to go in."

In time, Caitlin came to realize that things would never be the same for her. She struggled to adjust to the medication, which upset her stomach terribly at first, and struggled to

find a diet that was both healthy and palatable. Whatever worked for her would have to be a permanent lifestyle change, or she would slip right back to where she started.

Since first coming to Pitt in 1980, Arslanian has studied insulin resistance—then a relatively uncommon phenomenon in children. In treating children with insulin resistance, she has become an expert on childhood obesity and type 2 diabetes, and she has met many young people like Caitlin.

Another is Deborah Hays, who, like Caitlin, is 18 years old. She became a patient of Arslanian's about two years ago. Deborah had been uncomfortable with her weight for even longer, going all the way back to the fifth grade. From then until 10th grade, she says, she gained about 30 pounds each year. When she was 16, she went for a routine physical in order to apply for a Pennsylvania driver's license. She weighed about 300 pounds. Her urine sample contained excess sugar, so her doctor ordered some blood work and asked her to schedule a return visit.

When Deborah came in the second time,





she was advised to go to Children's Hospital of Pittsburgh right away. Her insulin and blood sugar were dangerously high. At Children's, she was admitted and given a diagnosis of type 2 diabetes. Like Caitlin, Deborah was put on metformin to lower her blood sugar and decrease her insulin resistance. She was also put on a low-sugar (including low carbs) and low-fat diet.

Diabetic children are typically associated with type 1 diabetes, a condition in which they suddenly cease to produce the insulin that regulates the cellular uptake of sugar. As a result, they immediately become dependent upon insulin therapy. The disease is not linked to obesity. Although the Centers for Disease Control and Prevention says that nationally representative data on type 2 diabetes in children are not available, it's clear that more children now develop type 2—what used to be called “adult onset” diabetes. Type 2 develops gradually from increased insulin resistance. As the body becomes resistant to the effects of its own insulin, the levels of the hormone rise. Blood sugar rises, too. In children, as in adults, the condition is linked to obesity. Not only is the incidence of type 2 diabetes increasing in children, but there are signs that its comorbidities—heart disease, cardiovascular disease, hypertension, high cholesterol, even blindness and loss of limbs—are more aggressive in children. Arslanian notes that some diabetic teenagers are developing the cardiovascular systems of 60-year-olds.

The solution for young people who are obese with type 2 diabetes? Arslanian is blunt: There is no question that they need to change their lifestyles, because their eating and exercise habits are unhealthy. Consuming 64 ounces of sugary soda every day and whiling away hours on screen-related activities is a recipe for trouble. There is a genetic component to type 2 diabetes—Deborah, for example, has a family history of the disease—but by and large, children develop it because of their routines. In the long run, Arslanian says, many such kids will become dependent upon insulin therapy, because the disease progresses fast.

Cultural shifts throughout the past few decades that contribute to the obesity epidemic went almost unnoticed at first. Fewer

children walk to school, and more children live in neighborhoods where there are no sidewalks and driving is the regular mode of transportation. And of course, there's the popularity of sedentary activities like video games and television. Further, more people eat at restaurants now, where portions are large. High-calorie foods are ubiquitous, even in the vending machines in schools.

There's evidence that we learn to overconsume. It's been demonstrated that young children have a natural ability to regulate caloric intake. In one Pennsylvania State University study, children younger than 6 ate a cup of pudding before lunch. Some ate a high-calorie pudding, and some ate an otherwise identical, low-calorie pudding. Twenty minutes later, the children had an all-you-can-eat lunch of sandwiches, fruits, and vegetables. The kids who

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ate the high-calorie pudding reduced the amount of lunch they ate, as if their bodies knew they required fewer calories. But when the experiment was repeated with adults, those who ate the high-calorie pudding ate the same amount of lunch as the others. Did the adults lack the ability to physiologically register calories consumed? Probably not. It's more likely that adults cognitively override that ability. Adults have learned to follow other cues: We're full when the plate (no matter how large) is empty. We're satisfied when we've gotten our money's worth from the all-you-can-eat buffet.

Lewis Kuller, professor and former chair of epidemiology in Pitt's Graduate School of Public Health, cautions that physicians who work with obese children have to be certain that they provide the tools necessary for these children to change. That means involving the entire family in the lifestyle adjustment. Imagine, he says, a family physician who examines an overweight child with two overweight parents and says to the child, “You need to lose weight.” It's exactly the same problem with smoking cessation, he says: “Getting kids to quit smoking when both parents are smokers—that's a tough row to hoe.” If children and families are not given the tools they need, then a doctor might do little more than label and further

stigmatize the child as overweight.

Arslanian agrees wholeheartedly. As director of the new Pediatric Wellness and Weight Management Center at Children's, she is overseeing the creation of an organization that includes not only physicians, but also nutritionists, behavioral psychologists, and exercise physiologists. All of these people are available to work with children and families to facilitate behavioral lifestyle changes, including diet, activity levels, and habits.

The center is participating in two large-scale NIH grants to address the increase in insulin resistance and obesity. One will treat youth with established type 2 diabetes under one of three treatment protocols that involve various levels of medication, education, and lifestyle coaching. The trial will help establish the most effective comprehensive treatment for diabetic children.

The second is a prevention trial in which the staff of the center will implement one of several lifestyle changes, such as nutrition education and increased physical activity,

in various public schools. They will measure body mass index and insulin sensitivity over the course of several years to discover the most effective ways to prevent insulin resistance and diabetes in children.

It's been four years since Caitlin Kelly was diagnosed with PCOS as an eighth-grader. Her story has borne out much of the received wisdom on treating adolescent obesity—the entire family has been involved in her successes.

Caitlin's family has had some experience with these sorts of adjustments. When she was found to be allergic to preservatives in store-bought meat as a little girl, her mother began raising chickens in the backyard. Her father built a house in which to raise them from 2-day-old peeps to adults. The family raised and slaughtered them 50 at a time and filled freezers with chicken. Caitlin's father, a former farmer, used his connections to buy local, preservative-free beef.

After much struggling to find other foods that she could eat and enjoy, Caitlin and her parents now eat fewer of the carbohydrates that once caused her so much trouble. Her mother and father have been a part of her treatment for so long that even when she is away at college, they habitually eat the foods



that she can eat and go to restaurants that have healthy options. “I got to the point where I can just eat something and know it’s got something in it we’re not supposed to have. I can just taste it,” says Ruth Kelly.

Caitlin is now a healthy weight for her 5-foot, 10-inch frame—160 pounds. Just before dinnertime recently she described what she had eaten that day: a low-carb shake for breakfast (she usually has cereal, but she was in a hurry to get to class) and chicken salad for lunch with some crackers. On a day like this, she’ll splurge on a baked potato with dinner. She’s even had days, during finals week, for example, when she’s eaten pizza for breakfast, lunch, and dinner, but those days are few and far between. Ruth Kelly marvels at how her once-introverted daughter has come out of her shell in her first year in college.

Deborah Hays’ progress in the two years she’s been under Arslanian’s care has not been as concrete. At age 16, she

stopped gaining weight each year, but her weight remains around 300 pounds. Her insulin resistance is somewhat controlled with the help of medication. But she has found it difficult to increase her level of physical activity while working a full-time job at a home for mentally retarded youth and finishing high school. Arslanian worries

about the effects of her weight on the progression of her diabetes.

Arslanian and her staff have enrolled the Hayses in a pilot study in which they provide the family with intensive education and support for developing a healthy lifestyle. A counselor visits with Deborah and her mother weekly to discuss healthy eating and living. A few weeks into the study, Arslanian’s team already had a finding: It was a challenge to bring everyone together for the regularly scheduled appointment. The same busy schedules that cause so many Americans to eat readily available, unhealthy food and neglect physical activity also complicate the process of finding alternatives.

Martha Hays, Deborah’s mother, who struggles with her own weight, roots for her daughter, saying, “I hope that, at the end of the 20 weeks, Debbie has a complete understanding that this is going to be a lifestyle change for her. ... Maybe she can be 30 pounds lighter and have the understanding that it’s hard, but it’s not something she can’t do.”

Deborah, who will be a full-time student at a local community college this year, says, “I just hope that I have the will to continue what I do for the rest of my life, because that’s what it’s going to take to continue being healthy, or being okay. I think it’s kind of hard because I’m young, and I can’t go out and just eat everything like everyone else does and drink whatever I want.”

*Names have been changed in this story to protect patient privacy.* ■

**FAMILIES CAN JOIN A NATIONAL STUDY ON TYPE 2 DIABETES AT CHILDREN’S: CALL 412-692-5928 OR VISIT [WWW.TODAYSTUDY.ORG](http://WWW.TODAYSTUDY.ORG)**

## A SURGICAL SOLUTION?

**Bariatric surgeries—abdominal procedures to treat obesity—can lead to loss of excess weight and improved overall health in obese adults. (See “Ghost Body,” p. 18.) The most common of these procedures is gastric bypass, in which the upper portion of the stomach is stitched off, reducing the capacity of the stomach by two-thirds. The small intestine is rerouted to connect to this smaller stomach. According to the American Society for Bariatric Surgery, the number of gastric bypasses performed increased 500 percent between 1993 and 2003.**

**But is gastric bypass appropriate for an adolescent? Only a few hundred such procedures have been performed on adolescents nationally, and evidence-based reports with long-term follow-up are lacking for both adolescent and adult populations. As of 2002, four adolescents had gastric bypass at UPMC; all showed significant weight loss, with the maximum follow-up being 22 months.**

**The National Institutes of Health recommends the procedure only for children who have not responded to conventional weight management programs and who have significant complications related to their obesity, such as sleep apnea, hypertension, fatty liver, arthritis, and respiratory problems. —CS**