



Weigh Smart patient
Imani Ingram with
pediatric gastroenterologist
Ann Scheimann.

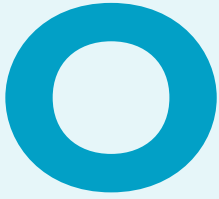


THE
SKINNY
ON CHILDHOOD
OBESITY

Bad lifestyle habits may begin at birth. The key to fighting this growing epidemic? Family involvement.

By Virginia Hughes

Photography by Keith Weller



On October 25, at 7 p.m. sharp, two chubby yet high-energy 8 year olds, Imani and Kyra, bounded into the lobby of the Mt. Washington Pediatric Hospital in Baltimore. The girls had reason to be excited: it was graduation night.

Their moms, only slightly less enthusiastic, followed behind, and chatted while waiting for an elevator up to the third floor. But Imani wouldn't have that. "This is Weigh Smart," she scolded, hands on hips. "We take the stairs!"

The two girls have taken some significant steps against America's fastest growing epidemic – childhood obesity. In 1965, according to data collected by the Centers for Disease Control and Prevention (CDC), 4.2 percent of American kids ages 6 to 11 were overweight. In 2004, the number had more than quadrupled—to 18.8 percent.

The problem persists not for lack of awareness. For more than a decade, pediatricians and policymakers have debated how to treat children who are already overweight, and how to prevent bad eating habits from taking root in the next generation. Some blame America's videogame culture, the alarming growth of fast food, the ubiquity of soda and snack food machines in schools.

Ann Scheimann, a pediatric gastroenterologist at Hopkins Children's, says the problem can be attributed to all of these factors. But the biggest problem is that these lifestyle habits begin at birth. "The key to healthy eating is that it has to be bought into by the family," Scheimann says. "And it has to be incorporated in a stepwise fashion, or else you'll get right back on the same bandwagon."

To this end, in September 2005 Scheimann started Weigh Smart—a "no-fault," family-based group therapy approach to healthy living. During two-hour evening sessions over 10 weeks, small groups of overweight children and their families first meet with a nutritionist to talk about what they eat – and how much – and learn how to choose healthier foods and smaller portions. The therapy session is always paired with 60 minutes of group exercise in the hospital's

gym. Now after two years, hundreds of children have completed the program – and it's working. Weigh Smart kids like Imani have lost pounds and body fat, and kept it off over time.

"I'm here because I'm a healthy girl, but I weigh a lot," Imani says. "I want to make better choices."

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– Ann Scheimann, M.D.

What's Behind the BMIs

Doctors were just beginning to note the rise of obese kids when Scheimann started her residency in 1990. Since coming to Johns Hopkins in 2000, she's seen more and more young patients who are severely obese. The body mass index (BMI) is a ratio of weight to height that physicians use to define what's normal; for children, a healthy BMI usually falls between the 5th to 85th percentile.

Of those who enter Weigh Smart, the average participant is 12 years old, 5'3", and 200 pounds. Most are well above the 95th percentile of BMI-for-age. They spend an average of five hours a day in

front of a computer or television screen, and have terrible eating habits. "Anecdotally, I'd say they're getting 300 to 500 calories a day from soda or juice," says Michelle Demeule, program manager for Weigh Smart.

School lunch programs, especially after the popular 2004 documentary *Super Size Me*, have taken center stage as a primary culprit for the childhood obesity epidemic. Soft drink and snack food machines are plentiful, especially in poor districts. And sadly, in high-crime areas, nutrition is often a low priority.

Even as they're eating more unhealthy food, schoolchildren are getting less physical activity – much less. According to the National Association for Sport and Physical Education, the percentage of students who attended a physical education class every day dropped from 42 percent in 1991 to 28 percent in 2003.

Regardless of what's happening in schools, kids inherit both genes and eating habits from their parents. Because parents are buying and preparing the food, Demeule says, "we really emphasize behavioral modification for the whole family. You don't want the child to feel punished."

Imani's mother, Nicole Ingram, remembers being an overweight child. "I struggled with weight my whole life, and so did my husband," she says. Two years ago, both parents opted for gastric bypass surgery. "And suddenly we lost all of this weight," she says. "But at the same time, Imani was gaining."

When the Ingrams' pediatrician recommended Weigh Smart, they agreed to try it. "I hope she can look back on her childhood," Ingram says, "and say that my mother helped me to feel better about how I eat."

More Worrisome Than Weight

Perhaps most alarming is that childhood obesity brings with it a host of chronic health problems, from social isolation and acid reflux to the more troublesome fatty liver disease and type 2 diabetes. Though obesity-related health problems have been recognized in adults for years, only recently have researchers noticed them in kids.

The most universal, and perhaps most overlooked, health issue is the psychological

stigma of being overweight. “There aren’t cool clothes that you can wear,” Scheimann says, “and people will say things.” This lowers a child’s self-esteem and only makes them more likely to overeat.

As for severe medical complications, Scheimann is one of the first researchers to study the frightening prevalence of non-alcoholic fatty liver disease (NAFLD) in children – 9.6 percent in all children and adolescents ages 2 to 19 years, and 38 percent in obese children (*Pediatrics*, October 2006). Also, NAFLD is a silent disease, detectable only through blood tests or ultrasounds, and has few early symptoms.

Though NAFLD can take years to develop, and even reverse itself with the right diet and exercise interventions, when left unchecked the potential health consequences are enormous. For 5 percent to 10 percent of patients, NAFLD will progress to liver inflammation with scar tissue, which sometimes then goes on to cirrhosis, and even complete liver failure.

In August 2005, Scheimann joined with

researchers in five other medical centers in an NIH-funded clinical trial to better understand the natural history and the best treatments for NAFLD. For adults, fat in the liver is usually attributable to past alcohol consumption or type 2 diabetes. Since most kids don’t drink alcohol, and few have type 2 diabetes, researchers haven’t figured out yet why fatty liver crops up in them. But one link is clear: Kids with NAFLD are all overweight.

“We’re trying to figure out whether changing your diet and exercise – or medications – is the best option,” Scheimann says.

The study participants were divided into three treatment groups: one control group that was given information about the benefits of a healthy diet and exercise; a second group that was given that information plus the diabetes drug metformin; and a third group that was given dietary information plus vitamin E, an antioxidant that might prevent inflammation. The results are not yet in, but Scheimann suspects diet and lifestyle changes will

most likely have the greatest impact.

Though nobody knows exactly why, excess weight also leads to a high resistance to insulin, the hormone released by the pancreas that regulates metabolism (see sidebar on page 9). Without insulin, sugar (glucose) would never be converted to energy. Someone with high insulin resistance needs more insulin to metabolize a given amount of glucose. And higher levels of insulin can lead to high blood pressure and higher levels of LDL, the “bad” cholesterol. For some, the pancreatic cells slowly lose the ability to produce insulin altogether, causing a rise in the level of glucose in the blood – the hallmark of type 2 diabetes.

Though the rate of type 2 diabetes in children has increased 10-fold in the past 20 years, it’s still pretty rare (less than 0.5 percent prevalence). Insulin resistance, on the other hand, is not uncommon, even in kids of normal weight. In these children, this resistance is not a problem because they can make more insulin to compensate. But obese kids are already insulin

An Epidemic for Homeless Children, Too?

One morning in the fall of 2003, behind the ornately carved front door and stained-glass windows of the 19th-century Presbyterian church on Baltimore’s Calvert Street, Kathy Schwarz stood in a cramped room with a little girl snug on her hip. The girl lived upstairs in the old church, which six decades before had been converted to housing for homeless families. Now called the Salvation Army Booth House, it’s the city’s largest shelter, and always filled. Schwarz, a pediatric gastroenterologist at Hopkins Children’s, and nurse Buffy Garrett, had been collecting data at Booth House for a study about hepatitis vaccine coverage among the city’s 5,000 homeless children. But that morning, the child in Schwarz’s arms took her in a different direction.

“I suddenly realized she was much too thin,” Schwarz says. “It occurred to me that here we had a unique opportunity to do a nutritional study, too.”

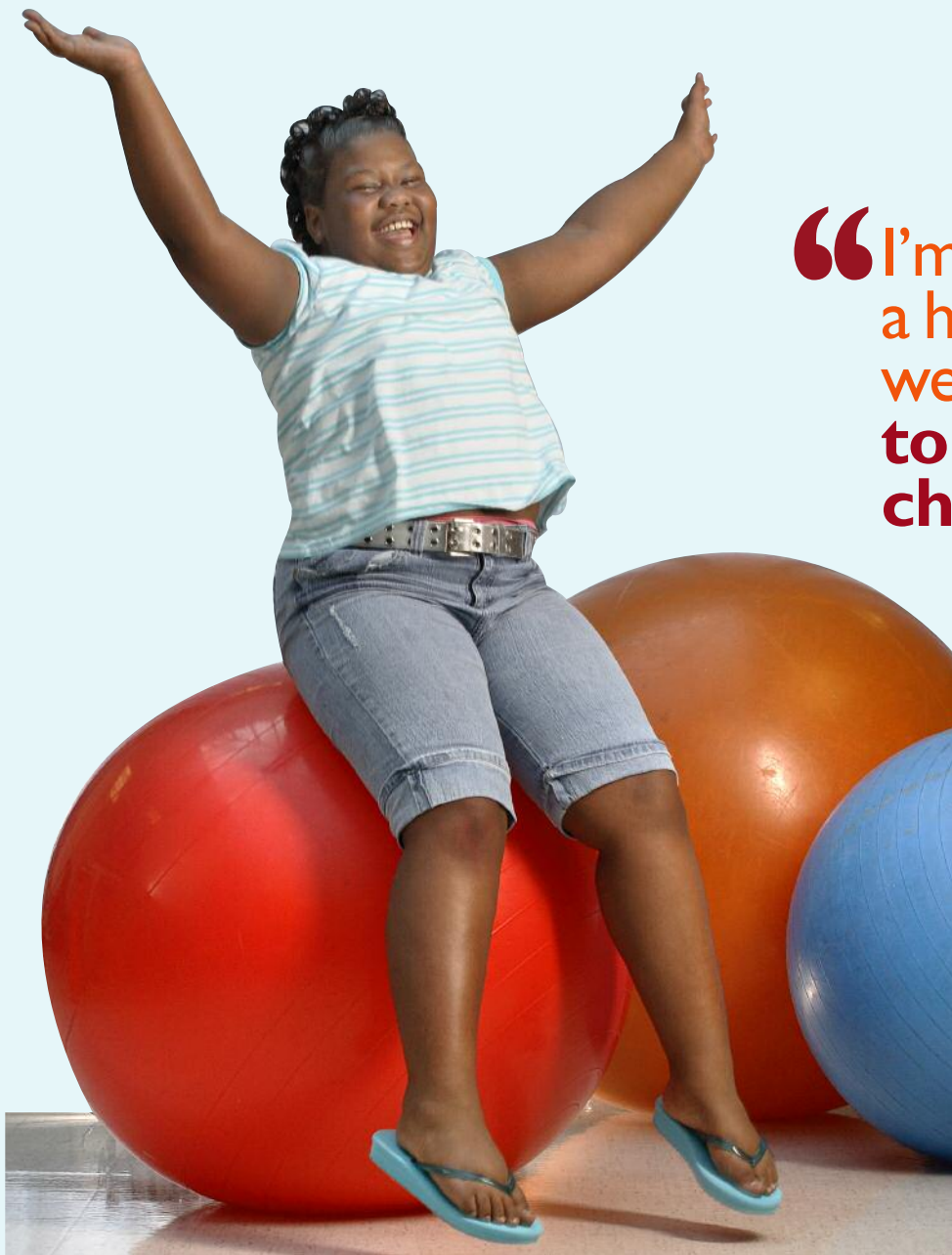
From then on, she took a scale along on her visits to Booth House and seven other homeless shelters in Baltimore. While previous nutritional studies of homeless children reported diets with major caloric, vitamin and mineral deficiencies, Schwarz’s data painted a different picture. Of the 60 children surveyed, none was underweight. Twenty five – or 42 percent – were overweight or at-risk-for-overweight, meaning their weight fell above the 85th percentile of what’s considered normal for their age and height (*Medscape General Medicine*, March 2007). What’s more, Garrett says 73 percent of the children ages 7 to 18 fell above the 95th percentile, making them “obese.” Surprisingly, Schwarz and Garrett found that the children in shelters were even heavier than children of the same income level who were not living in shelters. Likely factors, says Schwarz, include low-cost, calorie-dense meals in the shelters and fear of spending time outdoors in high-crime areas.

“Unfortunately, the obesity problem that’s now so prevalent in the rest of U.S. children is also mirrored in the homeless children – and even more so,” says Schwarz. “If what we saw in Baltimore’s homeless turns out to be a national trend, we’re headed for a crisis that would cost us hundreds of millions of dollars. That’s before we even try to measure the toll in terms of human suffering and loss of life.”

—VH

Pediatric
gastroenterologist
Kathy Schwarz





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resistant when they hit puberty, “and if you couple that with a sedentary lifestyle and a high carbohydrate diet,” Scheimann says, “you’re fueling the fire.”

Thus, as more and more children become overweight, pediatricians are seeing an increasing number of pre-diabetes cases, and a measurable reduction in glucose tolerance. The increase in LDL cholesterol that can accompany pre-diabetes has led to an increase in prescriptions of statins – cholesterol-lowering drugs – for kids at high risk of developing coronary heart disease. Outcomes studies have showed that statins are generally safe and effective for children, says Peter Kwiterovich, director of lipid research and atherosclerosis at Hopkins Children’s, though they can lead to serious liver complications. For children with high LDL levels, he

adds, statin drug treatment is “the best we have at the moment.”

What Works?

Family-based weight-loss therapy started in the 1970s, when clinical psychologist Leonard Epstein began one of the first such programs at SUNY Buffalo. His long-term follow-up data greatly impressed Scheimann: 10 years after completion of his program, about 35 percent of the kids maintained their weight loss. “You don’t really see that in other therapies,” Scheimann says.

When Scheimann came to Hopkins in 2000, she decided to model the existing obesity clinic, which was based on individual counseling sessions, on the Epstein group counseling program. Overweight children do especially well in a group set-

ting, Scheimann explains, because they’ve been socially isolated: “There’s already that element of needing to belong. If they learn healthy habits together, they do much better.”

Scheimann spent the next couple of years researching the few group therapy programs across the country and gradually came up with Weigh Smart. A collaborative venture funded by Hopkins Children’s, Mt. Washington Pediatric Hospital and the University of Maryland, the program has received over 1,400 referrals from local physicians. For 10 weeks, Weigh Smart kids – and their caregivers – meet at Mt. Washington for group classes covering everything from how to order a relatively healthy meal from McDonald’s to how to cope with teasing. The children also participate in 60-minute group exercise sessions, complete with so-called screen technology to encourage healthy living. In “Dance Dance Revolution,” for example, kids watch dance moves on the screen and try to mimic them on a twister-like floor mat.

Scheimann says in the future she’d like programs like Weigh Smart to branch out into telemedicine. She recently applied for a grant through the Robert Wood Johnson Foundation – which plans to spend more than \$500 million over the next five years to fight childhood obesity – for the use of things like video phone presentations or Web-based lectures to deliver nutritional information to rural areas.

Eating Healthy Early

Ingram says she has seen dramatic changes in her daughter’s behavior since she started Weigh Smart.

In one Weigh Smart session, the kids

are given menus from fast food chains and asked to design a meal with fewer than 500 calories. At McDonald's, Imani's favorite meal used to be the #2: two cheeseburgers, a large-size fries, and a Coke. "Now I just get one small cheeseburger and apple dippers instead of the fries."

These kind of small lifestyle changes and flexible, common-sense eating patterns are the pillars of Weigh Smart philosophy. "It's not punitive, it's not a diet, it's not about what the scale says," explains Nicole Ingram. "It's about how you look and feel and how you move and how you eat."

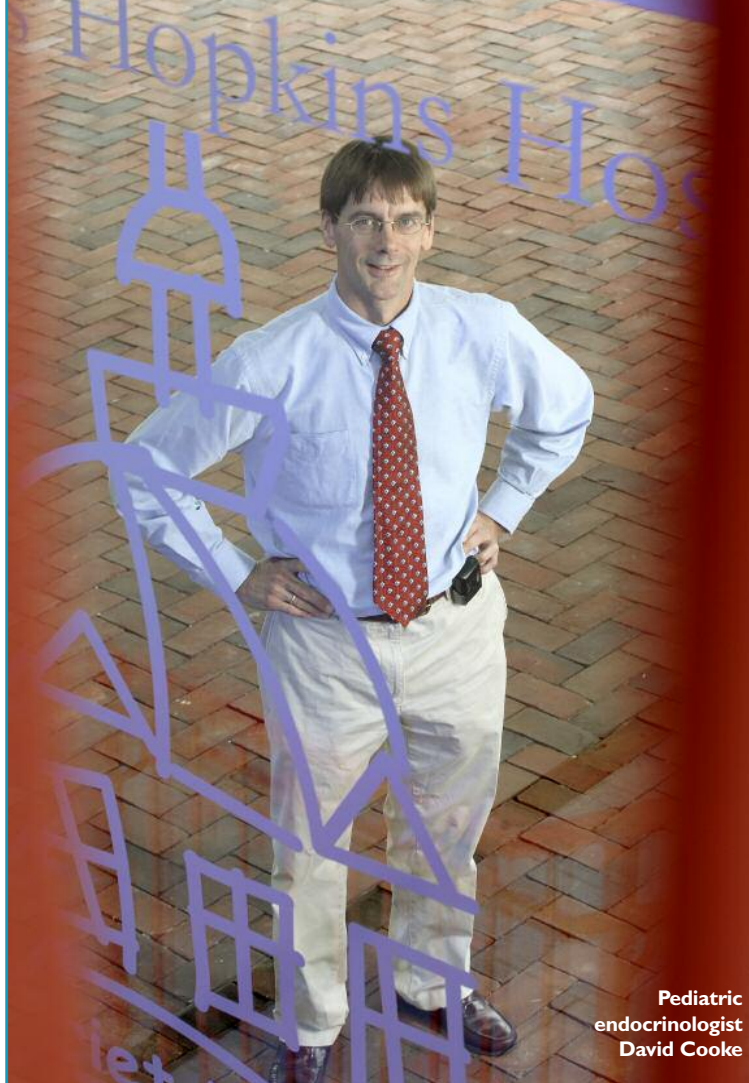
Imani's mental and physical health has improved as well. She no longer has tantrums over food, and now is physically active – enrolling in dance classes, and taking her Bichon, Snowblizz, for evening walks – in ways that she wasn't before. Prior to starting Weigh Smart, Imani was going to the hospital at least once a month because of complications from chronic breathing problems. Since starting the program, she's been to the hospital only once.

The medical benefits of the program aren't unique to Imani. The preliminary Weigh Smart data, which Scheimann presented at the North American Association for the Study of Obesity meeting in October, shows that children who completed the 10-week program saw statistically significant drops in their weight, BMI and body fat percentages. But because of the small sample size, it is too soon to draw conclusions about long-term outcomes.

"These are children who would typically gain 2 to 3 pounds in a 10-week period, so achieving weight loss in this population is significant," says Demeule.

Scheimann hopes that these positive results will spur more hospitals to offer more family-based group therapy programs. Moreover, she would like to see such programs brought into Head Start and other government-sponsored health education programs that target even younger kids. "The earlier the better," she says. "Because once you get to adolescence, you have more access [to bad foods], the behaviors are much more ingrained, and it's much harder to make changes." ■

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Fat Cells: Making Connections

Why does obesity lead to insulin resistance? "That's the \$60 million question," says pediatric endocrinologist David Cooke, who studies insulin resistance on the molecular level. The answer isn't yet known, but Cooke says that several factors, notably fat cells, are likely to contribute.

"If you asked a biologist 30 years ago, 'What's a fat cell?' they'd tell you it's a warehouse where the body stored fat," Cooke explains. But over the last few decades, medical research has shown that fat cell dynamics are actually much more complex. Fat cells secrete free fatty acids, which themselves can increase insulin resistance.

Fat cells also secrete hormones, like leptin, that play an important role in metabolism. Cooke cites several recent studies where mice were genetically altered so that they could no longer produce leptin. "When the mice can't make leptin they become extremely obese. Then, if you give it back to them, they'll shrink back down to a normal size."

Another oft-studied hormone is adiponectin, which has been shown to increase insulin sensitivity. "But fat cells in obese individuals make less adiponectin than normal," he says.

But it's not just fat cells. Cooke says that connections between insulin-sensitive tissues of the body, like liver, muscle and fat, might also help explain why obesity leads to insulin resistance. "Somehow," he notes, "insulin resistance in one tissue can affect insulin resistance in another."

Or course, curing the obesity epidemic, Cooke concludes, will cure the problem of insulin resistance. But that likely means attacking obesity on multiple fronts with behavioral and societal changes and combinations of medical therapies. Cooke says, "Waiting for the magic pill that will cure obesity is a dangerous approach."

—VH