HEALTH

YOUNG KIDS, A GENERATION OF CHILDREN OLD INTO BIOLOGICAL ADULTS, BODIES

RUNAWAY OBESITY IS TURNING AGING THEM BEFORE THEIR TIME

BY ALICE PARK

GLANCE THROUGH KIMBERLY RHODES' MEDICAL RECORDS AND THE diagnoses read like a complete spreadsheet of 21st century American health problems. She's gained 19 lb. (8.6 kg) in the past three years and developed insulin resistance, so she is now considered prediabetic. Her liver is embedded with layers of fat that have scarred the healthy tissue around it and caused cirrhosis. The enzymes it produces, which serve as a marker for how well it is functioning, have plummeted 84%. So far, her blood pressure hovers just within normal range, but she's borderline hypertensive. She is regularly treated by a family doctor, a gastroenterologist and an endocrinologist, but if her blood pressure keeps rising, it would mean another doctor—a nephrologist—to track whether her kidneys are suffering any damage. These measures are fairly typical for the roughly two-thirds of adult Americans who are overweight or obese.

But Kimberly is 13 years old, and if she is unusual, it's only because of the severity of her various conditions, not that she suffers from them. Her liver condition makes her so fatigued, she prefers to be homeschooled these days, distancing her from the world of her peers. Kimberly's mother Stacey says the Ohio teen started gaining

Kimberly Rhodes, 13, is homeschooled because of fatigue caused by poor health

Photograph by Katherine Wolkoff for TIME

weight "out of nowhere" when she was 4. "I am heartbroken. As a parent you never want to hear your daughter or son has any [health] problems, let alone a disease that may be a killer at one point," she says.

This is the American Nightmare—that for the first time ever, a generation of children may have a shorter life expectancy at birth than their parents. Obese children are at higher risk of heart disease, diabetes, stroke and atherosclerosis. They are twice as likely as their normal-weight peers to develop certain cancers and may be less likely to survive others.

In some ways, the premature sickening of a demographic that should be any society's healthiest is even worse than it seems. These kids aren't simply developing the diseases of adults; they are, in many ways, physically becoming adults. By the time they are barely 10, some obese children are pushed into puberty by bodies that are ready to reproduce even if they are not remotely ready to be sexually active. Their chromosomes show signs of wear in the same ways as those of much older people. Their tissues are accumulating the kinds of damage previously seen only in people of their parents' and grandparents' generations. Their very cells, if placed under a microscope, would look like an older person's, showing inflammatory and oxidative damage that is usually the result of a much longer, often indulgent life. Millions of middle schoolers are being prescribed medications that drug developers never intended for anyone under 40.

"I am thinking that we will have people in their 30s, 40s and 50s who should be at their most productive," says Dr. Siripoom McKay, a professor of pediatric endocrinology at Texas Children's Hospital, "who will be on dialysis or have had several heart attacks."

The adult drugs these kids take to battle high cholesterol, hypertension and other conditions present problems in children that they don't in grownups, if only because a 60-year-old may have to take them for 20 years whereas a 10-year-old would take them for 70. It's not just that the drugs haven't been well tested in children; it's also that they often have side effects, including stomach pains, muscle weakness and fatigue.

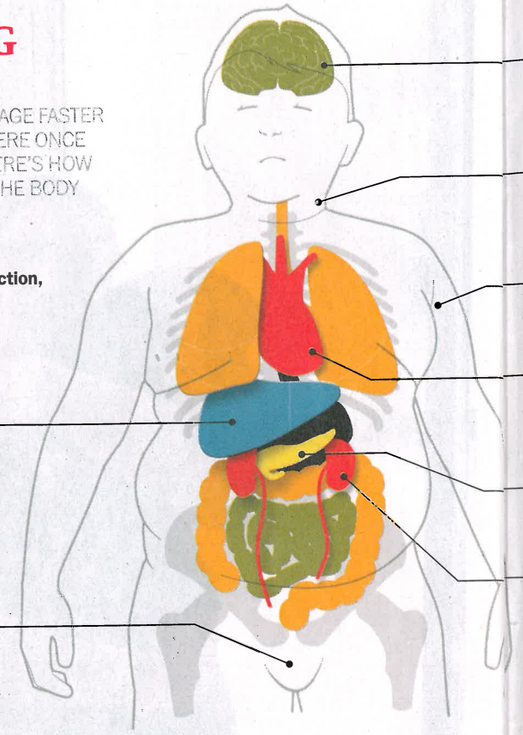
"It is a little controversial when you start to say that a child or adolescent should be on a statin," says Dr. Thomas McInerny, past president of the American Academy of Pediatrics (AAP). "But the alternative of having that child have a heart attack in his 30s or 40s is not a very pretty one."

And no matter the long-term effects of drugs, there's some question as to whether a child who has already started down the early-aging road can ever be fully healthy. Scarred tissue in the liver may never entirely recover, damaged chromosomes in the cells may be beyond repair, and obesity may trigger lasting changes in metabolism so that even when weight is taken off and kept off, food will never be processed in the same way again.

Obesity is not the only thing responsible for superannuated kids. Researchers are learning more every day about the downstream impact of stress on biochemistry, as well as about the potentially harmful effects of environmental agents, from pollutants to naturally occurring chemicals like hormones. The medical literature may, in a paradoxical way, benefit from all this, since it is accumulating knowledge about premature aging that would not have been available otherwise. But it comes at the cost of a perverse kind of longitudinal experiment—one that would violate every imaginable canon of ethics—in which healthy kids are placed under stress, immersed in a chemically toxic environment, fed a diet that causes them to gain more and more weight and then left to suffer the consequences.

A GROWING PROBLEM

OVERWEIGHT CHILDREN MAY AGE FASTER AND FACE ILLNESSES THAT WERE ONCE COMMON ONLY IN ADULTS. HERE'S HOW EXTRA POUNDS CAN AFFECT THE BODY



LIVER
Accumulated fat **impairs liver function,** just as heavy drinking does

FATTY LIVER
Obesity leads to **abnormally large organs**

CIRRHOSIS
Damaged cells are replaced by **scar tissue**

HORMONES
More adipose tissue causes **sex** organs to **mature earlier,** so puberty occurs around age 10

BRAIN
Obese children have higher rates of **depression, negative body image** and **low self-esteem**

THROAT
Excess tissue **restricts airways,** which can cause **sleep apnea,** in which breathing stops periodically

SKIN
Dark, velvety patches on the neck or armpits can be a sign of obesity-related health problems like diabetes

HEART
Cholesterol buildup can **thicken artery walls, restrict blood flow** and **increase the risk of heart disease and stroke**

PANCREAS
Excess fat can **impair the pancreas's ability to use insulin** to control blood sugar, leading to Type 2 diabetes

KIDNEYS
Sustained high blood pressure, or hypertension, can **damage the kidneys** and lead to **kidney failure**

AMERICAN EPIDEMIC
Since 1980 obesity prevalence among children ages 2 to 19 has tripled

32% ARE OVERWEIGHT OR OBESE

17% ARE OBESE

Boys: **16%** WHITE, **17%** BLACK, **24%** HISPANIC
Girls: **15%** WHITE, **23%** BLACK, **17%** HISPANIC

Sources: American Academy of Pediatrics; Centers for Disease Control and Prevention; American Heart Association; National Institutes of Health; American Medical Association

TIME graphic by Emily Maltby and Lon Tweeten

Paying the Price

"HE'S SO YOUNG, WE NEVER THOUGHT ANYthing would happen to him." That's what Eva Amador of Houston thought when she brought her 10-year-old son Eric in for his annual checkup last year. Eric's pediatrician had mentioned the boy's weight during previous visits: at 106 lb. (48 kg) and 4 ft. 8 in. (142 cm), he was on the heavy side for his age and height. But he either rode his bike or walked the four blocks to and from school and didn't spend much time in front of the television or computer. Amador and her husband figured he would start losing weight as he got a little older and the girls started paying attention. "My husband thought it was funny," she says.

A blood test changed their view. Eric's total cholesterol had soared to an alarming 266, and the doctor was concerned enough to order an ultrasound of his liver. That scan revealed real trouble. Eric's liver was larger than it should have been, and a biopsy confirmed that he had what's straightforwardly known as a fatty liver—a condition that's often the result of alcoholism and, regardless of the cause, is not usually seen in patients under 50.

But nonalcoholic fatty-liver disease is now the most common liver ailment worldwide among children, and the percentage of youngsters in the U.S. who may be affected by it more than doubled, going from 4% from 1988 to 1994 to nearly 11% from 2007 to 2010. "Their livers look exactly like someone who has been drinking for years," says Dr. Naim Alkhouri, director of the pediatric preventive cardiology and metabolic clinic at the Cleveland Clinic. And just like those heavy drinkers, the kids can go on to develop cirrhosis, with the fat damaging liver cells, preventing them from filtering toxins and waste from the body the way they're supposed to.

Eric's doctor told his parents the hard truth—that he had to lose weight and keep it off and that more than just his liver was on the line. "When the doctor said that he could have high blood pressure and then have sugar in his blood and that he could also have a heart attack and have cancer, I thought, Oh, my God, that cannot happen to my kid," Amador says. "I said, 'Can you give him medicine right away?' But he said, 'No, no, there is no medicine for him that will really work.'"

The reason for that has to do with the intimate and previously unappreciated connection between obesity and the aging process, something that begins in the cells—in this case, cells within fat tissue. Like other cells in the body, some fat cells have ways of protecting themselves from bacteria, viruses and other assaults by pumping out defensive chemicals and protein-shredding enzymes. But that same chemical warfare can be toxic to other cells in the vicinity. When too much of this collateral damage occurs, the result can be inflammation and a bodywide type of cellular damage that resembles changes seen in aging.

"It's looking more and more like obesity does some things that might just be tied to the fundamental aging processes," says Dr. James Kirkland, director of the Kogod Center on Aging at the Mayo Clinic. Worse, Kirkland says, the damage fat cells do to surrounding cells seems to be contagious, with other, otherwise unaffected cells effectively aging along with the damaged ones. That, at least, is the theory, and it gets a lot of support from studies of animals and elderly people—as well as kids in an entirely different population: childhood cancer survivors.

One of the terrible ironies of winning such a mortal battle so early in life is that in adulthood, cancer survivors tend to develop a number of diseases several decades earlier than average: they suffer heart attacks in their 40s rather than in their 60s or 70s and show signs of cognitive decline in middle age rather than in their 70s or 80s. The reason is not clear, but the research suggests that it's an as-yet-undefined result of the cancer, as well as the toxic consequences of radiation and chemotherapy. Whatever the cause, these patients show the same signs of accelerated cellular aging at the molecular level that researchers are starting to see in obese children.

In Eric's case, the first step to solving the problem was to change his diet. Amador removed candy from the house and switched Eric's favorite fruit punch to water and low-fat milk. She restructured her grocery list to include more fruits and vegetables and healthy snacks like sunflower seeds. She even had a talk with Eric's friends since she knew they often stopped by a corner store on the way home from school for candy, chips and soda. "I told them, 'If you love my Eric, do not take him to the store and do not use your money to feed him,'" she says.

In the past, Eric, like most other kids, would see a doctor once a year. Now he and his mother visit the hospital to see a gastroenterologist for his fatty liver once a month, and that's likely to continue for the foreseeable future. Dr. Sanjiv Harpavat, a pediatric gastroenterologist at Texas Children's Hospital and one of the people managing Eric's case, plans to put him on a trial that's testing whether cystamine, a drug used to treat a rare amino-acid disorder, can improve the symptoms of fatty liver. If it can, the boy might be spared the even greater problem of cirrhosis—to say nothing of the liver transplant that could be required later if his condition doesn't change. So far, however, Eric is drinking more water and becoming more physically active, and Amador is hoping for the best. "We are doing everything so he can change his life and his future," she says.

The Meds Dilemma

HOW LONG ERIC MAY NEED TO BE ON THE liver-protecting drug isn't clear, but for some children taking various medications, the answer could be as simple as it is terrible: forever. When Crystal Aguilar

Physical activity can help Eric Amador avoid complications from his fatty-liver disease

of Houston was diagnosed with diabetes at age 16, she sat in the car with her parents and cried. Having witnessed the bruises on the arms of her diabetic mother as a result of her daily insulin injections, she says, "I was terrified. I didn't want to spend the rest of my life like that."

At the time, Aguilar, who is Hispanic and concedes that her family was eating plenty of dense, high-calorie foods like tortillas and greasy meats, weighed 230 lb (104 kg). "I did not consider myself as big as I was," she says. Within a week of her diagnosis, she was giving herself two insulin injections every day. Although pills like metformin can help the body's insulin break down glucose more efficiently, for patients like Aguilar, whose blood sugars are so high, injectable insulin is often the quickest way to bring those levels back to within the normal range.

"When we start children on medications, we are entering a new phase of the disease," says Harpavat. "That's the point where we have to put our idealism that the kids will change their behaviors voluntarily aside. We almost have to save their bodies from themselves."

Beyond drugs, there aren't a whole lot of choices. The best the AAP can recommend as an alternative to the prescription pad are the familiar lifestyle strategies: a healthier diet and more exercise. A recent advisory panel added cognitive behavioral therapy to the mix to help kids learn self-management skills. As a guideline, it makes sense. In practice? Not so much. "The parents get excited for a day or two and listen to everything you say, and within days, it's done, and they revert back to their old habits," says Harpavat.

Recognizing this, the AAP also changed the guidelines it offers practitioners, recommending that they include advice about drugs like statins for children as young as 8 if they have elevated cholesterol levels and show signs of heading toward heart disease. The fact that we've arrived at a place where the AAP and AARP are starting to offer similar medical advice is something parents and pediatricians are struggling to accept.

It Takes a Village

THE PARADOX OF TREATING PREMATURELY aging kids is that varied as their problems are, there tends to be a one-stop-shopping strategy to address them all—with everything starting in the pediatrician's office. But doctors are learning to stress physical activity and healthy eating and measure a child's body mass index, or BMI, during checkups. In New York State, doctors are urged to document BMI in children as young as 2 or 3. "It helps pediatricians to point out that a child's weight may be trending in an unhealthy direction," says McInerny of the AAP.

Growing numbers of pediatricians are also starting to expand their skill set by learning about adult diseases such as fatty liver and hypertension. "We were trained in [them] but not in as much detail as family physicians," says Dr. Wendy Slusser, medical director of the Fit for Healthy Weight program at Mattel Children's Hospital at UCLA. "We're all having to learn more."

In her program, Slusser relies heavily on a team approach. Doctors, nurses, dietitians, psychologists and exercise specialists, as well as family members, are all recruited as part of treatment. The core of her program, however, involves communicating with kids in a style known as motivational interviewing. Instead of dictating advice, doctors try to get patients to articulate by themselves how they can change their behavior. A statement like "You could ride your bike for an hour instead of sitting at the computer" will never have as much impact as asking the child what activities they like to do and figuring out how to help them do those activities more often. It's more time-consuming, but the payoff is worth it.

"I always have to sit on my hands. And it takes a little bit of patience to wait an extra minute for someone to answer your question," says Slusser. So far, in a pilot group of 115 patients, she and her colleagues have brought down blood pressure enough to help those with high blood pressure avoid taking antihypertensive drugs. Overall, those in the treatment group have either lost weight or at least stayed stable over three months.

A number of schools have begun to measure students' BMI and send the data home to parents. Not all parents support the move, but the AAP stands by it. In some school districts in Texas, nurses are also alerting parents to what's known as acanthosis nigricans, a darkening and thickening of the skin in the back of the neck that can signal prediabetes. Children with this symptom are sent home with a letter, just as they would be if they had lice.

Still, nearly everyone who currently treats obese children knows that these programs are only a temporary solution. "The money lies in prevention," says Dr. Seema Kumar, a pediatrician at Mayo Clinic's Children's Research Center. And that push has to start early so that healthy eating, physical activity and effective strategies for coping with stress are second nature. Getting old, as any senior will tell you, is not easy. It's hard, it's painful, it's dispiriting—and it's 100% fatal. One of the great gifts of childhood is that the final act is—or at least is supposed to be—a long way in the future. Recognizing how obesity accelerates that time frame is the first step toward slowing things down and keeping old age where it's supposed to be—among the old. ■

KATHERINE WOLKOFF FOR TIME