



Young Survivors. What science can learn from the first generation of kids to beat childhood cancer

BY ALICE PARK

TO MOST PEOPLE, AUG. 27 IS A DAY just like any other. Tucked in between the carefree yawn of summer and the impending rigors of fall, it straddles a bittersweet block of the calendar, but to Karen Dyer, it is much more than that. Aug. 27, 1994, marked her arduous transition from typical teen to cancer patient. That was the day doctors removed what they thought was a benign cyst above her left hip. Then 15, Dyer learned that her life had changed forever. "It's funny," she says. "My main worry then was losing my hair, of looking different from everyone else. I never thought about dying. It really didn't occur to me that that was even a possibility."

It may have sounded naive then, but Dyer was on the right track. Along with some 300,000 other young adults in the U.S., she belongs to the first wave of childhood-cancer survivors to benefit from several decades' worth of research in treating cancer in the young. Now a graduate student at the University of South Florida, Dyer, 28, unlike so many young cancer patients before her, has every expectation of reaching the ordinary milestones in life—graduation, first job, marriage—that most of us take for granted.

And these young adults are doing much more than merely surviving. Their medical histories are rich textbooks for teaching doctors and future patients about how to overcome cancer—not just the initial dangers of the disease but also the late-stage complications of the surgery, chemotherapy and radiation that saved those young lives. "We know that we will see more and more long-term survivors," says Dr. Melissa Hudson of St. Jude Children's Research Hospital in

Memphis, Tenn. "Now we need to monitor them as they age, to understand how we can best help them to preserve and maintain their health."

It's a good challenge to face. Until recently doctors did not pay much attention to the long-term complications that might arise from the powerful poisons they were throwing at their young patients. They simply didn't have to; at best, only half of those children were expected to see their teens. But today, 1 in 1,000 young adults in the U.S. is a childhood-cancer survivor. Since the 1970s, the chance that a child would live for five years after a diagnosis of leukemia or lymphoma, the most common childhood cancers, has risen steadily, from an average of 25% to more than 80% today, outpacing recovery rates for most adult cancers.

Surprisingly, that success owes very lit-

tle to the development of new cancer drugs. Until 2003, there was no law enabling the U.S. Food and Drug Administration to require drug companies to test new medicines in children, in part because of concerns that this would endanger the rights and health of youngsters. Even today anticancer drugs are approved first in adults, leaving children to make do with older classes of medications. So most of the gains have come from wiser use of existing chemotherapy drugs in innovative combinations that are more potent as packages than as individual compounds.

Fortunately for these young patients, however, the strategy turns out to be extremely effective. Simply increasing the dose of certain agents, for instance, gives kids an advantage over some rapidly growing cancers. Young hearts, lungs and kidneys, it seems, are fairly resilient and can be bombarded with higher doses of toxic drugs than most adults can tolerate. And better medications for handling the side effects and consequences of chemotherapy and radiation—severe nausea, vomiting, anemia and infections—help children respond better to intensive treatment.

Yet, like any victims of trauma or shock, these youngsters never quite shake the mental and medical legacy of their early illness. They know their victory comes at a price, and science won't let them forget. With every new study of childhood-cancer survivors, evidence of the lingering health dangers from their treatments—heart disease, secondary cancers, cognitive deficits—continues to mount. "Sometimes I feel like a walking time bomb," says Dyer.

And so doctors are broadening their focus to include the health of not just the child they are treating



Enduring smile Dyer in 1995, after her chemo and radiation



today but also the adult they could be treating tomorrow. The most extensive study of pediatric-cancer survivors, an ongoing survey by the U.S. National Cancer Institute (NCI) that began in 1994, has found they are three times as likely as their cancer-free siblings to have a chronic health condition.

The most common problem involves the heart. Higher rates of atherosclerosis, heart attacks and strokes can stem from early exposure to chemotherapy agents, specifically anthracyclines like Adriamycin. Although powerful against tumors, these drugs can weaken the heart muscle and stiffen the blood vessels, promoting hardening of the arteries at a much earlier age than normal.

Serious heart disease, however, can be prevented with the right screening and follow-up care, and the same is true for many of the other severe health problems that can emerge years after cancer treatments. In previous decades, for instance, girls with Hodgkin's lymphoma were frequently treated with radiation to the chest, putting them at increased risk of developing breast cancer as young women. Screening them at age 25 instead of 40, as usually recommended, can pick up the disease sooner and, it is hoped, give doctors the chance to remove small lesions before they grow or spread. (Radiation is now rarely used for children.) Similarly, to stave off heart disease in graduates of chemotherapy, doctors can be more aggressive in prescribing cholesterol-lowering drugs or blood-pressure medications.

A yearly checkup by an internist or a general practitioner is crucial to maintain such vigilance. But despite the advice of their cancer doctors, only 20% of childhood-cancer survivors take advantage of this simple precaution, according to the latest figures from the NCI study. That's why these doctors are aggressively seeking out survivors, many of whom are now reaching their 30s and 40s, when many chronic conditions tend to strike. "We need to stop cataloging what happens to these patients and start introducing therapies that will either combat or prevent any long-term health effects of their cancer treatment," says Dr. Eugenie Kleinerman, professor of pediatrics at M.D. Anderson Cancer Center in Houston.

At this point, researchers have a good picture of what young patients can expect in the first decade after cancer treatment. But "what we don't know is what happens to people as they age further out, 20 to 30 years beyond that," says Dr. Charles Sklar of Memorial Sloan-Kettering Cancer Center in New York City. To fill that gap, Hudson and

St. Jude epidemiologist Les Robison are launching one of the most ambitious follow-up programs yet. They plan to contact 5,000 patients who have celebrated their 10-year survival anniversary and invite them to come back for free checkups for the rest of their lives. The program, like the hospital, is mainly supported by private donations. The first 650 volunteers are expected to inaugurate the St. Jude Life Project this month. They will undergo blood tests to evaluate kidney, liver, thyroid and immune function; MRI scans to look for abnormal growths; and, depending on the type of treatments they received, consultations with fertility and other specialists.

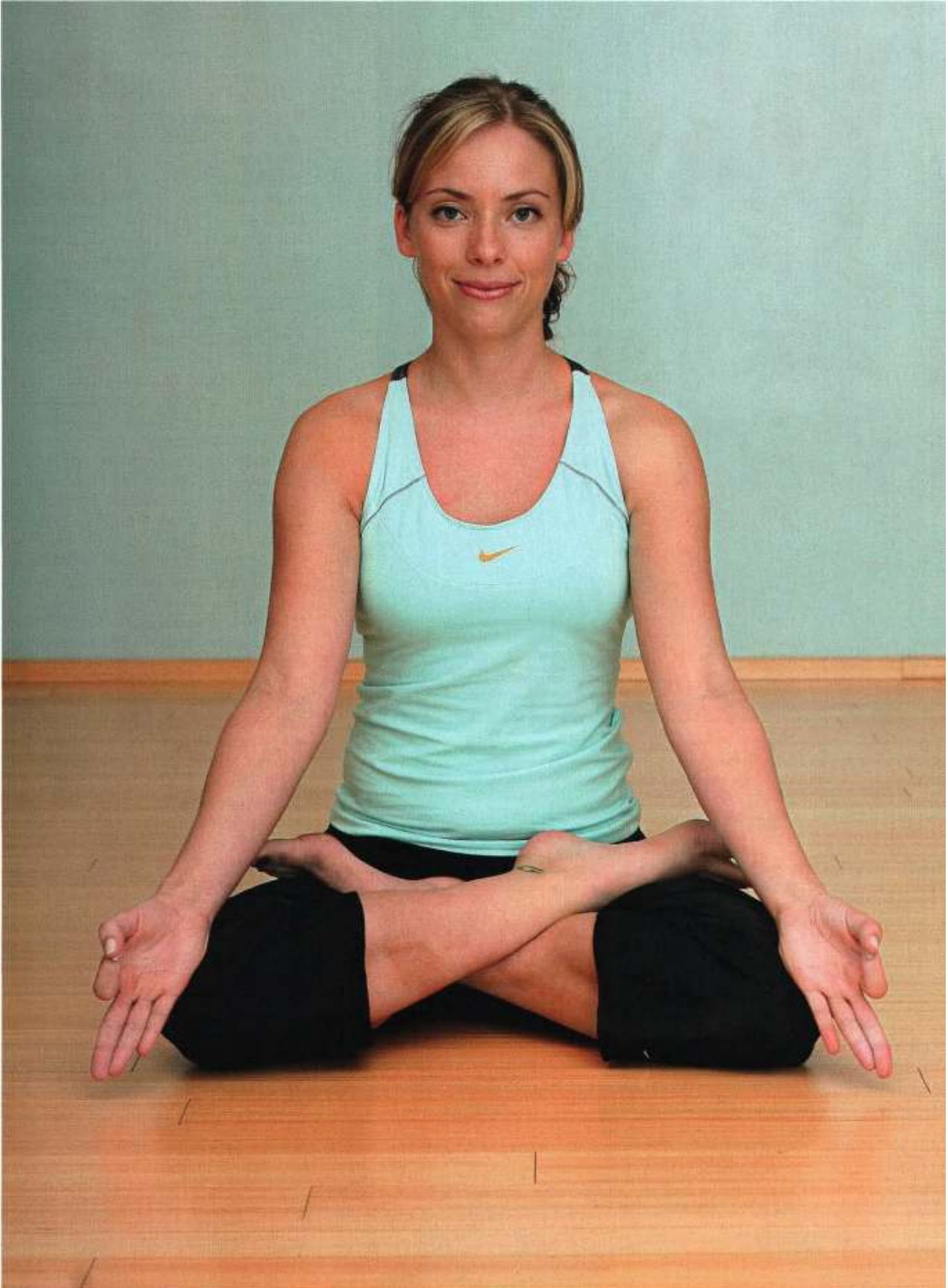
The push for more thorough aftercare screening is already helping survivors who are wrestling with a lot of unknowns about their health. "In my head, I had been expecting to have all the problems you read about—the heart problems, secondary cancers—all that stuff," says Dyer. But a recent evaluation at Sloan-Kettering indicated that Dyer so far shows no signs of the complications she had dreaded. "It was a huge relief," she says. So this Aug. 27, she will celebrate another year of being not only cancer-free but also healthy. Three years ago, to honor a decade of cancer liberation, Dyer went skydiving. "I just felt a sense of exhilaration, of really living life and not wasting moments by being afraid or questioning myself," she says. By helping scientists learn from her cancer, Dyer may inspire more survivors in coming years to do the same. ■

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—DR. CHARLES SKLAR, MEMORIAL SLOAN-KETTERING CANCER CENTER



Waiting room Evan Thomason, 6, at St. Jude Children's Hospital in Memphis, Tenn., to get chemotherapy for his nerve cancer



Living lotus Dyer, 28, was diagnosed at 15, recovered and now gets yearly checkups to avoid some of the health problems linked to cancer treatments