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## You'll be a Woman Sooner than Expected

by Susan Brink

(Los Angeles Times) At 8 or 9 years old, the typical American schoolgirl is perfecting her cursive handwriting style. She's picking out nouns, verbs, adjectives and adverbs in sentences, memorizing multiplication tables and learning to read a thermometer.

She's a little girl with a lot to learn.

And yet, in increasing numbers, when girls this age run across the playground in T-shirts, there is undeniable evidence that their bodies are blossoming. The first visible sign of puberty, breast budding, is arriving ever earlier in American girls.

Some parents and activists suspect environmental chemicals. Most pediatricians and endocrinologists say that, though they have suspicions about the environment, the only scientific evidence points to the obesity epidemic. What's clear, however, is that the elements of female maturity increasingly are spacing themselves out over months, even years -- and no one quite knows why.

While early menstruation is a known risk factor for breast cancer, no one knows what earlier breast development means for the future of girls' health. "We're not backing up all events in puberty," says Sandra Streingraber, biologist and visiting scholar at Ithaca College. "We're backing up the starting point." She has examined the research on female puberty and compiled a summary in an August 2007 report called "The Falling Age of Puberty in U.S. Girls." The report was financed by the Breast Cancer Fund, an advocacy group interested in exploring environmental causes of that disease.

Earlier breast development is now so typical that the Lawson Wilkins Pediatric Endocrine Society urged changing the definition of "normal" development. Until 10 years ago, breast development at age 8 was considered an abnormal event that should be investigated by an endocrinologist. Then a landmark study in the April 1997 journal *Pediatrics* written by Marcia Herman-Giddens, adjunct professor at the School of Public Health at the University of North Carolina, Chapel Hill, found that among 17,000 girls in North Carolina, almost half of African Americans and 15% of whites had begun breast development by age 8. Two years later, the society suggested changing what it considered medically normal.

The new "8" -- the medically suggested definition for abnormally early breast development -- is, the society says, 7 for white girls and 6 for African American girls.

### Through the ages

Puberty involves three stages: breast development, pubic hair growth and, finally, menstruation. Because the final event is typically the most memorable for women, it has been the one most scientifically documented in studies based on self-reported memories. The first 100 years that medical records were kept on the age of onset of menstruation saw continuous drops. Between about 1850 and 1950 in Europe, the average age of a girl's first period dropped from about 17 to about 13. (The U.S. doesn't have good data earlier than the 20th century, though trends were probably similar, says Steingraber, who prepared the August 2007 report after examining hundreds of studies on potential dietary, lifestyle and environmental causes of early puberty.)

Much of that decline probably has to do with better nutrition and public health improvements that reduced



the spread of infectious diseases. "Better diet, closed sewer systems, deep burial of the dead," Steingraber says. "By the beginning of the 20th century, those things were in place."

Adequate food and good health signal the brain that it's safe to reproduce, according to theories of evolutionary biology. "We're healthier and we weigh more," says Dr. Francine Kaufman, head of the center for diabetes and endocrinology at Childrens Hospital. "In some ways, puberty is a luxury."

With the brain picking up these signals, the hormonal parade can begin, first with the release from the hypothalamus of gonadotropin-releasing hormone, which sends other hormones from the pituitary gland through the bloodstream to the ovaries. The ovaries gear up production of a form of estrogen called estradiol, which initiates breast development -- the first step in puberty.

A second signaling pathway stimulates the adrenal gland to begin androgen production, which results in pubic hair. The final stage of puberty is the beginning of monthly periods.

But the first two events are happening significantly earlier in the lives of today's girls than they did in the lives of their mothers and grandmothers. The age of first menstruation has dropped too, at a rate of about one month per decade for the last 30 years, according to a January 2003 study in Pediatrics. Today, the U.S. average for first period is 12.5 for white girls, 12.06 for black girls and 12.09 for Latinas.

The gap between the first appearance of breast buds and menstruation grew wider by as much as a year and a half between the 1960s and the 1990s, according to research published in the October 2006 journal Current Opinion in Obstetrics and Gynecology. The time from breast buds to bleeding, according to Herman-Giddens, is now close to three years.

In short, that finely tuned biological process may have reached a tipping point. Since the 1960s, Herman-Giddens says, the decline in the age of maturity has crossed the line from positive reasons, such as better diet, to negative ones, such as eating too much, exercising too little and the vast unknowns of chemical pollution.

The lack of adequate explanation has some experts worried. "Over the course of a few decades, the childhoods of U.S. girls have been significantly shortened," Steingraber says.

### **Redefining 'average'**

The new average age of puberty, some fear, may be like the new average weight -- typical, but terrible.

"My fear," Herman-Giddens says, "is that medical groups could take the data and say 'This is normal. We don't have to worry about it.' My feeling is that it is not normal. It's a response to an abnormal environment."

Dr. Paul Kaplowitz, chief of endocrinology at Children's National Medical Center in Washington, D.C., and lead author of a special article Oct. 4, 1999, in the journal Pediatrics suggesting a redefinition of early puberty, isn't so sure. Too many girls are being labeled abnormal, he contends.

"Maybe we shouldn't be worrying so much about those girls," he says. "The chance of finding a serious condition in a 7-year-old with pubic hair is very, very small."

There have always been rare cases of extremely early puberty, called precocious puberty. One report, going back to 1834 in Butler County, Ky., was of a baby girl whose hips and breasts began to grow soon after she was born. By the age of 1, she was menstruating and at age 10, she gave birth to a 7-pound baby. Such extreme cases today would be examined and treated.

But the beginnings of breasts, and the first pubic hair, at ages 8, 7 or even 6 for African Americans falls at the low end of today's new normal range.

With statisticians proving that "average" is younger than recently thought, environmental activists are asking whether hormones in food, pesticides in produce or phthalates in plastics and cosmetics could be contributing to breast buds in third-graders. Social scientists have lifestyle suspicions. Does the stress of fatherless households, or the stimulating effects of sexually suggestive television shows, have anything to do with earlier signs of puberty? The suspicions remain difficult to prove.

Despite the reassurance of pediatric endocrinologists that younger development is normal, a lot of parents are still nervous, Kaplowitz says.

"If somebody calls in and says, 'I've got an 8-year-old with breast buds,' there's nothing I need to do," he says. "I discourage referrals. But they show up anyway."

Kaplowitz examined evidence for all suspected environmental and lifestyle factors in his book, "Early Puberty in Girls: The Essential Guide to Coping With This Common Problem."

"The explanation for which there's the most evidence is that it's related to the trend in increasing obesity," he says. "There are other factors, such as if your mother matured early. Sometimes we simply don't know. But overall, the biggest single factor is the trend toward obesity." Fatty tissue is a source of estrogen, so chubbier girls are exposed to more estrogen.

"With environmental influences, there has been a lot of speculation, but little hard data. I'm not suggesting there's no connection, but it's very hard to say there's a proven connection. I think it's environmental mainly in the sense that overeating and lack of exercise is environmental," Kaplowitz says. "I've tried to take the view that we shouldn't be alarmed about this."

Herman-Giddens is not so convinced, but concedes that evidence for environmental causes is close to impossible to obtain. "I myself am shocked sometimes to see very thin girls, 8 and 9 years old, with breast development," she says. "But with all the estrogen-like elements in the environment, it's virtually impossible to study. There's no place to find an unexposed population."

The biggest concern, she says, is that earlier puberty means longer lifetime exposure to estrogen, and early puberty, along with late menopause, is known to increase the risk of breast cancer.

But to design a study in which some girls are deliberately exposed to higher doses of such chemicals would be unethical, she says. Some animal studies provide cause for concern about endocrine-disrupting chemicals, but little hard evidence for humans. And a handful of industrial accidents have provided some data. In 1973, for example, estrogenic chemicals were inadvertently mixed in cattle feed in a Michigan community. The daughters of pregnant and nursing women who ate meat and dairy products from the cows were studied and were found to have begun their periods up to a year earlier than girls not exposed to the chemical, according to a 2000 study in the journal *Epidemiology*.

### **Time for a talk**

What's clear is that physical appearance is getting ahead of other aspects of girls' maturity. They might be perceived as far older than they are, even when they're still rummaging through their mothers' closets to clomp around in oversized high heels.

"My daughter started developing breasts maybe around age 8," says Rhonda Sykes of Inglewood. "She was still into her doll phase and dressing up to play." So Sykes began having frank mother-daughter conversations about curves and changing bodies a bit earlier than she expected.

"Whatever they look like, they know nothing," says Diana Zuckerman, president of the National Research Center for Women and Families. "Eight- and 9-year olds are learning to make change for a dollar. These are children who are learning the most fundamental facts in school. Imagine trying to teach that child the fundamentals of sex. They're not even playing Monopoly yet. They're still playing Candyland."

The medical community calls earlier puberty normal, the trend goes hand in hand with the obesity epidemic, and science has not yet pinpointed the reasons. And yet, when girls who are still children in the minds of their parents start developing breasts, many of their mothers remember that it happened later in their own lives -- and wonder why.

Theorists and advocates continue to search for definitive evidence, and little girls continue to look like young women at earlier ages. "My biologist brain says, 'There's not a lot you can conclude from the [environmental] evidence,'" Steingraber says. "But I've got a 9-year-old girl. And as a mother, I say, 'They've introduced all these chemicals into the environment, and they have no idea what it's doing. What are they, nuts?' I want

data demonstrating safety, not data demonstrating ignorance."