



Pitt pediatric surgeons Henri Ford (right) and Edward Barksdale Jr. have blazed new ground with basic science research and innovative procedures, all the while taking motherly admonishments to heart.

MOM WAS RIGHT | BY DOTTIE HORN

# CAREFULLY TENDED

**T**hirteen-year-old Henri Ford thought he was going to Brooklyn just for the summer. That's what his parents told him and his siblings when they left Haiti. As autumn approached, Ford learned the family wasn't going back. His father, a preacher who'd been outspoken against socioeconomic inequities in Haiti, had removed his family from the country because he feared reprisals. Ford missed his friends. He realized he was stuck forever.

But real culture shock didn't hit until Ford left the Haitian community in Brooklyn to start as an undergraduate at Princeton. Ford's family couldn't afford a car in New York; he had always used the bus and subway. Now, teens who owned late-model Benzes and BMWs surrounded him.

Shock hit again when Ford got back the first exam he took at Princeton. The class was chemistry. "Tragic" is the word Ford uses to describe the C he made on that exam. *This is where the game is being played*, he thought. *You've got to get up there*. Never did he

PHOTOGRAPHY | C. E. MITCHELL



entertain self-doubt or accept mediocrity. Instead, he adjusted his study habits and went on to graduate with honors.

As a member of a men's group at an East Liberty church, Ford now tries to inspire youth. His message: *The only issue is how badly you want something. I am here to teach you the rules of the game.* He invites teens to shadow him for a day or work in his lab. Sitting in his office, his degrees and licenses neatly arrayed on one wall, Ford talks about the importance of being a role model, envisioning two plants—one that has been carefully tended for a long time, another that has been ignored: "If you provide the same nurturing to the neglected plant, it may not catch up, but it will be almost as beautiful."



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**Before they cut the umbilical cord, Pitt pediatric surgeons, working with doctors at Magee-Womens Hospital, intubate newborns who have neck masses that would otherwise obstruct breathing.**

As chief of the Division of Pediatric Surgery in the University of Pittsburgh School of Medicine, Ford can talk for hours about his division—the minimally invasive initiatives, the surgical oncology program, the intestinal care center, the trauma program, the National Institutes of Health grants. But his list doesn't end with the standard parameters of academic success: "If they were the sole measure of my pride, then I'd have seriously screwed-up judgment." He boasts about associate professor Edward Barksdale Jr.'s involvement with a program to help critically ill children and their families (see p. 32). He can't leave out the division's extensive injury prevention initiatives—funded in part by the Robert Wood Johnson Foundation—which take surgeons and staff into the community for education and advocacy. "I don't know of too many other divisions where people are as engaged," he says.

**A**n ultrasound showed the fetus had a large, noncancerous tumor visibly bulging from the neck. The mass

would obstruct breathing at birth. Inserting a tube to supply the newborn with oxygen would not be easy. Ninety percent of babies born with such neck masses die. Even with special equipment, intubation is often too tricky to accomplish within the few minutes the baby can survive without breathing.

So Barksdale and colleagues took another approach. They intubated the baby after he was partially removed from the uterus by cesarean and *before* the umbilical cord was cut. This gave them a 45-minute window before the placenta would separate on its own from the uterus—buying them precious time while the child still received oxygen from his mother. "You get 45 minutes to get the breathing tube in, or if you can't, to do a tracheotomy," says Barksdale.

The surgeons likely saved the baby's life by performing this rare EXIT (Ex-Utero Interpartum Therapy) procedure. EXIT is now standard procedure at Magee-Womens Hospital for treating neck anomalies that obstruct breathing at birth. And Pitt pediatric surgeons believe they can help expecting families by treating disorders even sooner. At a few American medical centers, surgeons are operating on fetuses to treat spina bifida, holes in the diaphragm, and other serious conditions. Ford is betting fetal techniques will become more widely accepted and wants Pitt to be at the forefront of fetal surgery if that happens. Drawing on the school and medical center's strengths in obstetrics, maternal and fetal medicine, among other areas, he plans to create a center for fetal surgery.

**T**he boy growing up in Lynchburg, Virginia, imagined himself as D'Artagnan, the sword-fighting adventurer in *The Three Musketeers*. Barksdale admired the esprit de corps of the band of four. "I was inspired by that camaraderie, that ability to have a group of close-knit friends working together for good things," he says.

The would-be D'Artagnan took up fencing while a sophomore at Yale. He was lousy. Every day, his hard-nosed coach would yell at him: *You're a big, strong guy, but you're just a sissy.* In his junior year, one of the leaders of the team quit, and Barksdale took his place. Afterward, he overheard his coach say, *Gee, we're going to do poorly this year. We've got Ed.*

"I was convinced that he had underestimated my ability," says Barksdale. He practiced four to six hours a day. His junior year, he did well; his senior year, he finished fourth in the country. In Barksdale's office, along with many

photographs of children he has treated over the years, is a shot of him, taken just after winning one of several medals he amassed his senior year.

When the year was over, he gave up fencing. But his affinity for D'Artagnan has not abated, perhaps because those old movies resonate with messages he has received since his earliest days. As he's advanced in his career, acquiring funding for his basic science research on the childhood cancer called neuroblastoma and becoming codirector of the intestinal care center at Children's Hospital of Pittsburgh, his mother continues to tell him: *Make sure that you're doing things to help those in the community who are less fortunate. There are things that are more important than where you end up in your career.*

**W**hen he was brought to the emergency department, the 6-year-old was awake and talking. He wasn't supposed to drive the family all-terrain vehicle, but while his parents were at work, he decided to go for a ride. He hit a tree. The boy's abdomen was only a little bruised, but his CT scan revealed a split liver. Barksdale and Ford operated together, trying to save the liver. The boy died in the operating room. "I always remember him smiling and being awake before we took him back and the devastation of telling his parents," Barksdale says.

More than 50 percent of deaths in children are caused by trauma—falls, motor vehicle and pedestrian accidents, abuse, and other such injuries. Children's Hospital has the busiest pediatric trauma center in the country, according to Ford. Its 10 pediatric surgeons will treat about 1,700 trauma cases this year. About 20 percent of those cases will be potentially life threatening.

The greatest gains in saving the lives of injured children can be made through prevention, says Ford. He codirects the Benedum Trauma Program with Barbara Gaines. Last year, its outreach program held nearly 200 events, including sessions in schools to teach head-injury prevention. At 45 car-seat checks, offered at fire stations and other neighborhood centers, trained staff members helped parents determine if they had age-appropriate safety restraint devices and how to properly position their children within them. Sometimes the approach to prevention is less hands-on. In 1999, a Pittsburgh 2-year-old watching *Teletubbies* tried to hug the television. The TV fell off its stand, onto the boy, killing him. In response, Barksdale held a press conference, resulting in national media coverage of the incident. He also wrote to the US Consumer Product Safety Commission. Soon after, that TV stand design was taken off the market.

**“If [academic successes] were the sole measure of my pride, then I’d have seriously screwed-up judgment.”**

**N**ew York City, 1976—Ford and Barksdale met for the first time. The two 17-year-olds were attending a summer program for underprivileged minority students interested in medicine who would be starting at Ivy League schools in the fall. At first glance, Barksdale was not particularly impressed with Ford, with his booming voice and “persona”: “I’m being polite when I say ‘persona’ because there’s a three-letter word that begins with ‘e’ and ends with ‘o’— I’ll just say, he has such a booming persona, I was a little taken aback initially.” To Ford, Barksdale seemed like a country boy from Hicksville—quiet and provincial. Yet, the two became friends that summer.

Harvard Medical School, 1980—Ford and Barksdale enrolled. If a friend was in danger of failing a medical school exam, Ford would stay up late and sacrifice getting an honors grade in order to make sure that his friend passed. “That selflessness was attractive,” says Barksdale. The two learned that they were so much alike, it was sometimes uncanny. Several times, when Barksdale was walking around Boston, Haitians would come up to him and start speaking Creole. He *looked* Haitian, Ford’s family thought when they met him.

Eighteen years have passed since they graduated from Harvard. Every year, the Fords go to the Barksdales for Christmas dinner. Barksdale’s parents are there, up from Lynchburg. Ford calls Barksdale’s mother “Mom.” “There is a bond between me and Ed that is really stronger than anything we could have even envisioned,” says Ford. “We’re always striving for the same goal.” Both surgeons have received teaching awards and both were named Healthcare Heroes by the *Pittsburgh Business Times*.

**T**he premature infant began vomiting after her feedings. She suffered from necrotizing enterocolitis (NEC), a disease that affects 7 to 10 percent of premature infants born in the United States each year. The disease is fatal in 10 percent of those who develop it.

An x ray showed a hole in the baby’s bowel. During an emergency operation, Ford found that feces had leaked out of the bowel into the abdominal cavity. He washed out the contamination and removed the perforated section of the bowel as well as the surrounding damaged tissue. He gave the baby a temporary ileostomy, redirecting the feces so the intestine would have time to heal.

Ford also is familiar with NEC at the cellular and molecular levels. In adults, he explains, the cells that line the inside of the intestines—the enterocytes—are stuck together as if with crazy glue, forming an impenetrable barrier. In infants, the gut barrier is immature—the glue doesn’t work, which permits “antigen sampling.” In other words, a few foreign particles need to enter the gut during a newborn’s early days so that the immune system can become primed to recognize invaders.

In premature infants, however, because the lung is immature, some enterocytes may die from insufficient oxygen. Just one of those dead cells can create a gap in the gut barrier, allowing too many antigens and bacteria to enter. What was supposed to be limited antigen sampling turns into overstimulation of the immune system. The toxins released as part of the immune response eventually attack the enterocytes themselves. As cells die, a hole may form in the intestine large enough to spill out stool or fluid.

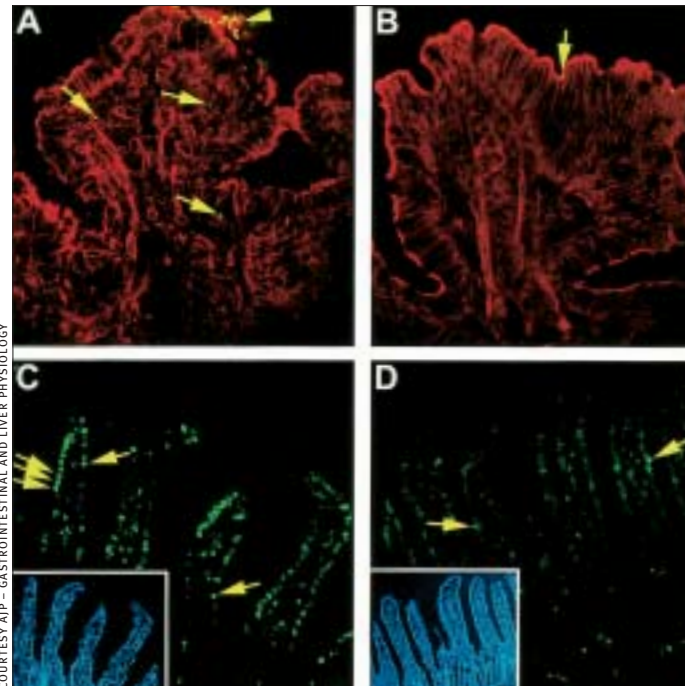
Ford’s research has shown that nitric oxide (NO) plays a key role in the escalation of the immune response. His main findings: NO is overproduced in infants with acute NEC. By inhibiting NO production, you get a more effective gut barrier. That work has helped to reveal possible therapeutic strategies for NEC, says Gail Besner, of Children’s Hospital in Columbus, Ohio. “I would say only five pediatric surgeons in the country can do what Dr. Ford can do,” says Besner. “He can go to the research lab and compete with the most highly trained of scientists, in terms of his skills and productivity and success in basic science.”

In all, four of the 10 surgeons in Pitt’s division pursue basic science research—in addition to Barksdale’s work on neuroblastoma, assistant professors Jeffrey Upperman and David Hackam study NEC. “The concept of pediatric surgeons doing research is relatively novel,” says Ford. “In most institutions, this is not feasible, mostly because the clinical work load is so immense.” Pitt’s is among the top pediatric surgery divisions in the country in terms of research funding.

**C**ulture shock hit again when Ford returned to Haiti in 1997. It was his first time visiting since he left at the age of 13, and he witnessed a level of poverty

he hadn’t imagined while growing up there. “When you see a tiny little room with no toilet, just one single room, and 12 people have to live in it—and six or eight of them may be under 7—it’s just horrific,” he says. During a week of operating at the Hôpital Albert Schweitzer, he saw other moving realities: a lack of resources, malnutrition, despair.

“The toughest part, after you come back from Haiti, you ask yourself, ‘How can you



**Ford found that inhibiting nitric oxide production (B and D) can thwart destruction of gut barrier cells and prevent bacterial invasion (indicated by yellow arrows) seen in necrotizing enterocolitis.**

seriously focus on doing basic science research, getting millions of dollars from the NIH to kill rats and mice, when you know there are people out there dying from malnutrition?” says Ford. At the same time, he realizes his research could have important applications in places like Haiti—for example, better understanding how the gut barrier fails in NEC might lead to new ways of treating gut origin sepsis, a serious problem in developing countries.

In the meantime, Ford supports fund-raising activities for the hospital in Haiti and hopes to return. And he keeps competing priorities in check by asking himself: *Where am I going to make the biggest difference?*

“Applying my skills in a place like Haiti brings a tremendous amount of good,” he says. “Being involved with disadvantaged kids, letting them know they can achieve or surpass what I’ve achieved, that’s where the satisfaction comes. That’s big.” ■