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The Henry Ford of Heart Surgery

In India, a Factory Model for Hospitals Is Cutting Costs and Yielding Profits

By **GEETA ANAND**

BANGALORE -- Hair tucked into a surgical cap, eyes hidden behind thick-framed magnifying glasses, Devi Shetty leans over the sawed open chest of an 11-year-old boy, using bright blue thread to sew an artificial aorta onto his stopped heart.

As Dr. Shetty pulls the thread tight with scissors, an assistant reads aloud a proposed agreement for him to build a new hospital in the Cayman Islands that would primarily serve Americans in search of lower-cost medical care. The agreement is inked a few days later, pending approval of the Cayman parliament.

Tending to India's Health-Care System



Ryan Lobo for The Wall Street Journal

Dr. Shetty prepares for surgery.

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Dr. Shetty, who entered the limelight in the early 1990s as Mother Teresa's cardiac surgeon, offers cutting-edge medical care in India at a fraction of what it costs elsewhere in the world. His flagship heart hospital charges \$2,000, on average, for open-heart surgery, compared with hospitals in the U.S. that are paid between \$20,000 and \$100,000, depending on the complexity of the surgery.

The approach has transformed health care in India through a simple premise that works in other industries: economies of scale. By driving huge volumes, even of procedures as sophisticated, delicate and dangerous as heart surgery, Dr. Shetty has managed to drive down the cost of health care in his nation of one billion.

His model offers insights for countries worldwide that are struggling with soaring medical costs, including the U.S. as it debates major health-care overhaul.

"Japanese companies reinvented the process of making cars. That's what we're doing in health care," Dr. Shetty says. "What health care needs is process innovation, not product innovation."

At his flagship, 1,000-bed Narayana Hrudayalaya Hospital, surgeons operate at a capacity virtually unheard of in the U.S., where the average hospital has 160 beds, according to the

American Hospital Association.

Narayana's 42 cardiac surgeons performed 3,174 cardiac bypass surgeries in 2008, more than double the 1,367 the Cleveland Clinic, a U.S. leader, did in the same year. His surgeons operated on 2,777 pediatric patients, more than double the 1,026 surgeries performed at Children's Hospital Boston.

Next door to Narayana, Dr. Shetty built a 1,400-bed cancer hospital and a 300-bed eye hospital, which share the same laboratories and blood bank as the heart institute. His family-owned business group, Narayana Hrudayalaya Private Ltd., reports a 7.7% profit after taxes, or slightly above the 6.9% average for a U.S. hospital, according to American Hospital Association data.



At the Narayana Hrudayalaya Hospital in Bangalore, Dr. Devi Shetty and his fellow cardiologists perform about 600 operations a week. They're making heart surgery affordable to some of the poorest people in India. WSJ's Geeta Anand reports.

The group is fueling its expansion plans through private equity, having raised \$90 million last year. The money is funding four more "health cities" under construction around India. Over the next five years, Dr. Shetty's company plans to take the number of total hospital beds to 30,000 from about 3,000, which would make it by far the largest private-hospital group in India.

At that volume, he says, he would be able to cut costs significantly more by bypassing medical equipment sellers and buying directly from suppliers.

Then there are the Cayman Islands, where he plans to build and run a 2,000-bed general hospital an hour's plane ride from Miami. Procedures, both elective and necessary, will be priced at least 50% lower than what they cost in the U.S., says Dr. Shetty, who hopes to draw Americans who are uninsured or need surgery their plans don't cover.

By next year, six million Americans are expected to travel to other countries in search of affordable medical care, up from the 750,000 who did so in 2007, according to a report by Deloitte LLP. A handful of U.S. insurance plans now give people the choice to be treated in other countries.

Some in India question whether Dr. Shetty is taking his high volume model too far, risking quality.

"On one level, it's a damn good idea. My only issue with it comes from the fact that if you pursue wholesale volumes, you may give up something -- which is usually quality," says Amit Varma, a physician who serves as president of health-care initiatives for Religare Enterprises Ltd., a publicly listed financial services group in Delhi. Religare is part of a conglomerate that also owns Fortis Healthcare Ltd., a rival hospital chain.

"I think he has reached the point where if you increase volume any more, you could compromise patient care unless backed up by very robust standard operating procedures and processes," Dr. Varma says.

But Jack Lewin, chief executive of the American College of Cardiology, who visited Dr. Shetty's hospital earlier this year as a guest lecturer, says Dr. Shetty has done just the opposite -- used high volumes to improve quality. For one thing, some studies show quality rises at hospitals that perform more surgeries for the simple reason that doctors are getting more experience. And at

Narayana, says Dr. Lewin, the large number of patients allows individual doctors to focus on one or two specific types of cardiac surgeries.

In smaller U.S. and Indian hospitals, he says, there aren't enough patients for one surgeon to focus exclusively on one type of heart procedure.

Narayana surgeon Colin John, for example, has performed nearly 4,000 complex pediatric procedures known as Tetralogy of Fallot in his 30-year career. The procedure repairs four different heart abnormalities at once. Many surgeons in other countries would never reach that number of any type of cardiac surgery in their lifetimes.

Dr. Shetty's success rates appear to be as good as those of many hospitals abroad. Narayana Hrudayalaya reports a 1.4% mortality rate within 30 days of coronary artery bypass graft surgery, one of the most common procedures, compared with an average of 1.9% in the U.S. in 2008, according to data gathered by the Chicago-based Society of Thoracic Surgeons.

It isn't possible truly to compare the mortality rates, says Dr. Shetty, because he doesn't adjust his mortality rate to reflect patients' ages and other illnesses, in what is known as a risk-adjusted mortality rate. India's National Accreditation Board for Hospitals & Healthcare Providers asks hospitals to provide their mortality rates for surgery, without risk adjustment.

Dr. Lewin believes Dr. Shetty's success rates would look even better if he adjusted for risk, because his patients often lack access to even basic health care and suffer from more advanced cardiac disease when they finally come in for surgery.

Dr. Shetty, 54 years old, is a lanky and chatty man. He grew up in Mangalore, another south Indian city, the eighth of nine children. Doctors were gods in the Shetty household, swooping in to save his restaurateur father who suffered from chronic diabetes and fell into diabetic comas several times in the young boy's life.

He had already resolved to be a doctor when his fifth-grade teacher told the class that a South African surgeon had just performed the world's first heart transplant. In that moment, Dr. Shetty says he decided to become a heart surgeon.

After graduating from medical college in India, Dr. Shetty trained in cardiac surgery at Guy's Hospital in London, one of Europe's top medical facilities. He had been operating there for six years when the Birla family, leading industrialists in India, decided to start a heart hospital in Calcutta. Dr. Shetty was brought in as the first director.

On returning to India in 1989, Dr. Shetty performed the first neonatal heart surgery in the country on a 9-day-old baby. He also confronted the reality that almost none of the patients who came to him could pay the \$2,400 cost of open-heart surgery.

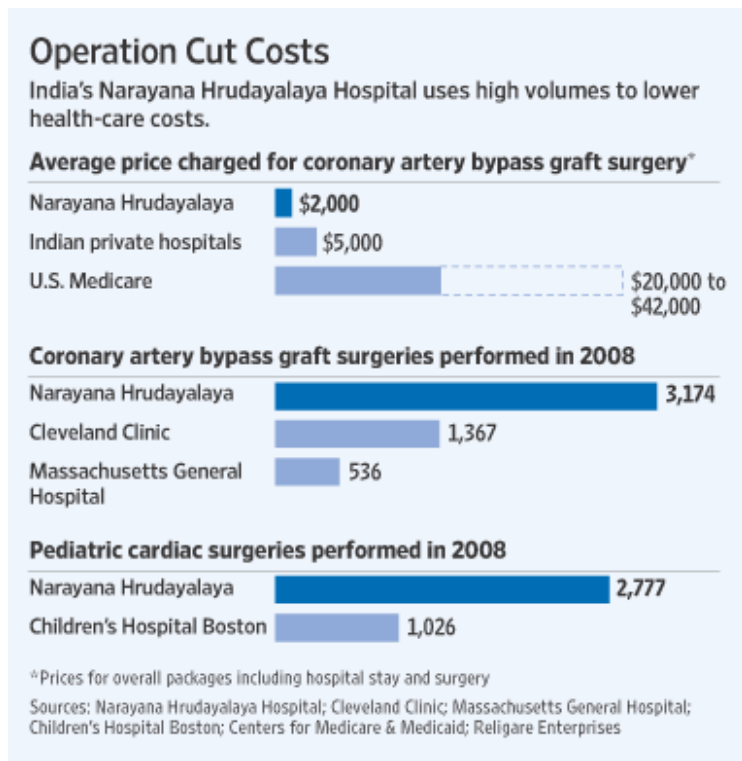
"When I told patients the cost, they would disappear. They literally didn't even ask about lowering the price," he says.

During that time, Mother Teresa had a heart attack, and Dr. Shetty was called to operate on her. From then on, he served as her personal physician. Two pictures of Mother Teresa still adorn the white walls of Dr. Shetty's office, one with white type saying, "Hands that serve are more sacred than lips that pray."

Dr. Shetty set about pursuing a heart hospital big enough to make a difference in a country where most of the people needing heart surgery can't afford it. His father-in-law, the owner of a

large construction company, agreed to build and finance a heart hospital in his wife's hometown of Bangalore.

In 2001, the white-washed, red-roofed Narayana Hrudayalaya Hospital opened on 25 acres that had been a marshland around a cement factory.



A lobby with seating for hundreds is encircled by dozens of offices for surgeons to consult with patients. A giant statue of a many-headed deity -- representing gods in the Hindu pantheon -- stands in the center of the lobby.

In a second-floor operating room one October morning, Dr. Shetty finished sewing a new aorta onto the heart of his 11-year-old patient. The process provided an example of how he slashes costs. Four years ago, the sutures would have been bought from a Johnson & Johnson subsidiary. Today they are made by a Mumbai company, Centennial Surgical Suture Ltd.

Four years ago, Dr. Shetty scrutinized his annual bill for sutures -- then

\$100,000 and rising by about 5% each year. He made the switch to cheaper sutures by Centennial, cutting his expenditures in half to \$50,000.

"In health care you can't do one big thing and reduce the price," Dr. Shetty says. "We have to do 1,000 small things."

He says he would also like to find lower-cost versions of his priciest medical equipment. But the Chinese makers that have brought good quality, cheaper machines to market don't yet have enough local service centers to ensure regular maintenance.

So he is still buying equipment from General Electric Co. He pays \$60,000 for echocardiography machines, which use sound waves to create a moving image of the heart, and \$750,000 for cardiac catheterization labs, which produce images of blood flow in the arteries and allow surgeons to clear some blockages using stents and other devices.

V. Raja, head of GE's health-care business in India, declined to comment on specific pricing, but says Dr. Shetty drives a hard bargain and wrestles some savings because he is such a big customer. Between Narayana Hrudayalaya and another hospital he runs in Calcutta, Dr. Shetty's group performs 12% of India's cardiac surgeries, Mr. Raja says.

Dr. Shetty also gets more use out of each machine by using some of them 15 to 20 times a day, at least five times more than the typical U.S. hospital.

Cardiac surgeons at Dr. Shetty's hospitals are paid the going rate in India, between \$110,000 and

\$240,000 annually, depending on experience, says Viren Shetty, a director of the hospital group and one of Dr. Shetty's sons.

Dr. Shetty was paid almost \$500,000 last year, according to the group's audited financial statements.

Here, too, Dr. Shetty finds additional savings on the per-patient cost. His surgeons perform two or three procedures a day, six days a week. They typically work 60 to 70 hours a week, they say. Residents work the same number of hours.

In comparison, surgeons in the U.S. typically perform one or two surgeries a day, five days a week, operating fewer than 60 hours.

Dr. Shetty says doctor fatigue isn't an issue at his hospital, and in general, his surgeons take breaks after three or four hours in surgery. The morning after Dr. Shetty operated on 11-year-old Mahesh Parashivappa, the boy sat in bed in the pediatric intensive care unit, a white bandage on his bare chest.

Virtually all of the 80 beds in the unit were full. K. Parashivappa, the boy's father, a sugarcane worker from a village eight hours away, held a cup of water to his son's lips. He says he's known his son needed surgery since he was born with a congenital heart defect. The boy has never been able to run and play cricket like other children, hobbled by chronic shortness of breath and weakness.

Mr. Parashivappa says he can't himself pay for the surgery, but it is covered by a farmers' insurance plan that Dr. Shetty began several years ago in partnership with the state of Karnataka, which includes Bangalore.

Nearly one third of the hospital's patients are enrolled in this insurance plan, which costs \$3 a year per person and reimburses the hospital \$1,200 for each cardiac surgery.

That is about \$300 below the hospital's break-even cost of \$1,500 per surgery.

The hospital makes up the difference by charging \$2,400 to the 40% of its patients in the general ward who aren't enrolled in the plan. An additional 30% who opt for private or semi-private rooms pay as much as \$5,000.

The father, in an untucked brown shirt, raised both hands to offer the traditional Indian greeting, "Namaste," to Dr. Shetty as the hospital head stopped by his son's bed. "Thank you for giving my son his life back."

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