



*Molly McCarthy, here with Dr. Emile Bacha and her mother Mary, has fully recovered after undergoing heart surgery at the age of three days.*

## Change of Heart Treatment for Pediatric Patients

**B**y the time little Molly McCarthy left the hospital two weeks after birth, she had already had open-heart surgery.

Born with the primary arteries of her heart in a switched position, Molly was immediately transferred to the University of Chicago Children's Hospital. She underwent surgery at three days old.

According to her physician, **Emile Bacha, M.D.**, Director of Pediatric Cardiac Surgery at the Hospital, early is the only time to successfully repair this relatively common congenital heart defect. Indeed, the condition is lethal if not corrected within three weeks; when Dr. Bacha operates within this time frame, his success rate is 100 percent.

At the forefront of pediatric cardiac research and treatment, Dr. Bacha used tiny pre-robotic instruments to switch the position of Molly's arteries. During surgery, he stabilized her heart with a solution he helped to develop.

Safer than previous versions, Dr. Bacha's solution has played a significant role in raising the survival rate for all open-heart surgery to 95 percent. It has proven to be not only less detrimen-

tal to the heart, but also capable of promoting the organ's recovery.

"We are giving these babies a normal life," Dr. Bacha says. "They're not impaired in any way...they grow up to play sports."

Though the percentages are relatively low (between 4 and 12 per 1,000 live births), congenital heart defects are one of the greatest threats to the health of infants. According to Dr. Bacha, the heart is the most commonly deformed organ in the body. "It is not any fault whatsoever of the parents," he stresses. "I tell them it is plain bad luck."

But with new advances in technology and treatment, the prospects are good for infants with congenital heart disease. In addition to his work with myocardial preservation (solutions like the one used for Molly that arrest and stabilize the heart during surgery), Dr. Bacha has led promising research in several other areas.

For example, he heads an ongoing study of diet supplements. Dr. Bacha and his team have found that certain amino acids taken orally prior to surgery can strengthen the pulse of the heart when it

is restarted. "This makes surgery even safer for kids," he says.

Another project Dr. Bacha explores is the causes of heart failure. Waged on the molecular level, this investigation tracks a gene that is expressed only in the failing heart. "If we can confirm the gene and then alter it," Dr. Bacha says, "we may one day be able to use it as an aid during surgery."

Pediatric heart transplantation is another area of Dr. Bacha's expertise. He has worked with children of all ages and range of defect, beginning with his first surgery at the University of Chicago Hospitals, a fairly routine transplant for an 11-year-old girl. On the other end of the spectrum, Dr. Bacha performed high-risk heart transplantation on a two year old with heart failure and lung damage. In this case, he kept the child stable on a heart-lung machine for three weeks while waiting for a heart donor. Today, the child is alive and healthy.

Finally, Dr. Bacha is working on new solutions to heart valve replacement. One study explores valve repair as an alternative to replacement. "A prosthetic valve doesn't grow with a baby,"

Dr. Bacha explains. "You have to put in another valve down the road. In some patient populations we can avoid that problem by repairing the valve with the child's own tissue. This repair procedure enables the valve to grow."

In the future Dr. Bacha says he will be able to create an entirely new, normally functioning valve from the child's tissue. "Currently we are successfully growing new valves for sheep," he says. He hopes to begin clinical trials in humans within the next few years.

In the meantime, little Molly McCarthy has a heart as good as new. "Thank God someone had the ability to perform this operation on our baby," says Molly's mother, Mary McCarthy of Palos Park, IL. "She recovered so quickly. Our situation just had a great ending."

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