

The Better to See You With, The Better to Treat You With

In the operating room physicians need to see what they're doing. When the procedure involves the use of a catheter to reach and to examine the inside of the heart, having the technology to provide a distinct image is essential. The imaging procedure must also be satisfactorily safe for the patient and for medical personnel. As a result, advances in imaging consider both accuracy and safety.

The most commonly thought of way to "see" inside the body is by using fluoroscopy, better known as X-rays. Though useful, X-rays can lead to harmful health effects, particularly for children. Instead of using X-rays, imaging tools are available that do not require real-time X-ray use. Imaging today can provide a three-dimensional picture of the heart to a cardiologist. This virtual picture can be rotated 360 degrees to allow the image to guide the cardiologist through the organ to defective heart cells.

Once inside the heart with the catheter, the physician may be required to ablate, or remove, defective heart cells. Ablation must be precise to avoid complications such as heart perforation, coronary artery injury, and blood clot formation. Most importantly, accuracy is needed to prevent the need to repeat the procedure if the initial ablation is unsuccessful. The ablation procedure can use radiofrequency to burn the cells; a procedure requiring X-rays to image the heart. An alternative ablation procedure freezes the abnormal cells. Arkansas Children's Hospital employs this procedure, called cryoablation, and one of its pioneers, Dr. Volkan Tuzcu, is perfecting its use.



ACHRI researcher Dr. Tuzcu is a pediatric cardiologist and Arkansas' only pediatric electrophysiologist. He performs this technique approximately 100 times a year and has a high success rate with cryoablation. He also shares his knowledge and understanding of cryoablation through demonstrations, publications, and presentations with other physicians.

Recently, Dr. Tuzcu had a 20-month-old patient named Faith with tachycardia, an abnormally rapid heart rhythm, which also resulted in significant swelling of the toddler's heart. "Cryoablation is elective for ages 6 or over at our center," says Dr. Tuzcu, "it is used in a few infants and was very useful in this difficult case." He adds, "The results of our and others' research show safety for the use of cryoablation in children."

"Faith was small and he initially did not want to use the procedure on Faith," says her mother Kim, "It got to the point where surgery was the only way to save her life." The surgery was successful, and Faith's heart rate and blood pressure became normal.

Dr. Tuzcu excelled the cryoablation technique, and unlike most other centers, now the outcome of cryoablation procedures is the same as that of radiofrequency ablation. Not requiring X-ray while being able to do that is another significant advantage. Dr. Tuzcu is increasingly using cryoablation for his patients. The main advantage of cryoablation he notes is the reduction of complications that can occur with burning cardiac cells.

Kim reflects, "If there is a diagnosis with no answer, research helps to find it. It saved the life of my child; without it, Faith wouldn't be here." Faith celebrates her second birthday next month. The family has asked that instead of presents, guests bring a donation for electrophysiology at Arkansas Children's Hospital.



Established in 1989, Arkansas Children's Hospital Research Institute provides an on-site research environment for faculty of the University of Arkansas for Medical Sciences working on the Arkansas Children's Hospital campus. Over 120 pediatric researchers with expertise and experience that span the breadth of medical disciplines comprise ACHRI's roster of investigators who work to fulfill its mission to improve children's health, development, and well-being through high quality research. For more information, visit <http://achri.archildrens.org>.