Ahmanson/UCLA ACHDC Experiences Monumental Growth

The Ahmanson/UCLA Adult Congenital Heart Disease Center has experienced tremendous growth in recent years, and has now cared for over 5,000 patients since its inception in 1980. Center leadership is addressing the challenges of providing enough clinic space, faculty and staff to provide the highest level of care. Our center’s director Dr. Jamil Aboulhosn has a clear vision for ACHD care at UCLA that includes 24/7 hospital resources to care for the most complex patients with congenital heart disease and cardiologists and nurses with the advanced training and expertise to address their comprehensive medical needs. Dr. Jeannette Lin joined our center in 2012, sharing ACHD coverage between UCLA and UC Irvine. Starting in March 2016, she now spends the majority of her time at UCLA, while continuing to maintain an outreach clinic at UCI. This has allowed us to expand to offering clinics every weekday. Dr. Leigh Reardon continues to split his time caring for adults with CHD, children and adolescents with CHD, and adults and children with advanced heart failure who need heart transplant. Dr. Aboulhosn, who is internationally recognized for his expertise and innovation in interventional catheterization procedures, spends two days each week performing complex catheterizations on patients referred from throughout the country.

ACHD Board Examination Nationally Offered

The American Board of Internal Medicine (ABIM) and other certifying organizations approved a board-certification exam for ACHD in 2014, with the first exam being offered in October 2015. Over 400 cardiologists and pediatric cardiologists in the United States took the exam, and 225 passed the test to become board-certified in ACHD. The certification offers patients validation that their cardiologist has advanced training to care for adults with congenital heart disease. Dr. Jamil Aboulhosn is a member of the ABIM committee that created the ACHD board examination.

New ACHD Cardiologist at UCLA

Gentian Lluri, MD, PhD has completed his two-year fellowship in ACHD cardiology at UCLA and began his career as a faculty cardiologist with our team on July 1, 2016. He received his MD and PhD degrees and completed his internal medicine residency at University of Illinois at Chicago. He then completed his adult cardiology fellowship at UCLA, before embarking on his ACHD fellowship. Dr. Lluri has a longstanding interest in molecular biological pathways that guide cardiac development and the disturbances of these pathways that can lead to cardiac malformations. His work at UCLA will focus on advancing his important research and leading our ACHD research efforts. He will also be available to see ACHD patients in our clinics and spend some of his time caring for our hospitalized ACHD patients. Dr. Lluri is fluent in Spanish, Italian and Albanian. We are excited to have Dr. Lluri continue his career at UCLA, and are confident he will help advance the understanding of the substrates for congenital heart disease.
Joseph K. Perloff Endowed Lectureship

2016 Joseph K. Perloff Endowed Lectureship

Dr. Joseph K. Perloff, founder of the Ahmanson/UCLA Adult Congenital Heart Disease Center was honored in 2008 with an endowed lectureship, which enables UCLA to invite prestigious leaders in the field of adult congenital heart disease to visit our program each year and share valuable insights about this evolving field. The Perloff Lectureship now memorializes Dr. Perloff’s vision that adults with congenital heart disease deserve state-of-the-art specialized care based on a foundation of rigorous research, and provided by well-trained adult congenital cardiologists. Dr. Karen Stout has accepted the 2016 Perloff Lectureship, which will take place on August 26, 2016. Dr. Stout is the Director of the University of Washington Adult Congenital Heart Disease Program in Seattle. In addition to leading one of the largest ACHD programs in the nation, she is recognized for her work in spearheading the movement for board certification of ACHD cardiologists, and for operationalizing the accreditation process for ACHD comprehensive care centers. She also played an integral role in updating the ACC/AHA Guidelines for Management of Adults with Congenital Heart Disease, which will be published in 2016.

Introducing our ACHD Fellows

Joanna Ghobrial, MD, MS, joined us for a two-year fellowship in ACHD in July 2015. Her focus is on catheter interventions in the ACHD population under the mentorship of Dr. Aboulhosn. She comes to UCLA with a multi-cultural background, speaking fluent French, Arabic, and Spanish. She attended medical school at Wayne State University in Michigan, and did her residency at Boston Medical Center & VA Medical Center in Boston, MA. She completed her cardiology fellowship at University of Washington Medical Center, Harborview Hospital & VA Medical Center in Seattle, WA. She also obtained a Masters of Science in Epidemiology and Clinical Research at UW in Seattle. After her cardiology fellowship, she moved back to Boston to complete an adult interventional cardiology fellowship at Beth Israel Deaconess Hospital, Harvard University. She is passionate about providing congenital cardiac care in developing areas, and is starting an organization, “Moyo.Life,” in association with “Chain of Hope,” a charitable organization established in the UK by cardiac surgery pioneer Sir Dr. Magdi Yacoub. She is planning a mission to Addis Ababa, Ethiopia in the fall of 2016.

Ian Lindsay, MD, is a pediatric cardiologist began a two-year fellowship at UCLA in ACHD on July 1, 2016. He was born in Salt Lake City, UT and attended medical school and completed residencies in both pediatrics and internal medicine at the University of Utah. He then came to UCLA for his pediatric cardiology fellowship. He first became interested in ACHD as an intern when he cared for a Fontan patient with the flu and was fascinated by this complex physiology in an adult patient. He has spent numerous rotations with our ACHD service over the past three years and is familiar with many of our patients. Dr. Lindsay is married and has an infant daughter named Aurora. He is an accomplished musician, and has a passion for politics and human rights. Please join us in welcoming Dr. Lindsay to our ACHD team.

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**Contributions**

**How You Can Help**

The Ahmanson/UCLA Adult Congenital Heart Disease Center relies on donations in order to pursue many of its goals. This support is vital to the ACHDC’s ability to continue providing high-quality care for adult patients with CHD. Your tax-deductible contributions directly support:

- Patient programs focused on enhancing quality of life, including newsletters, educational websites, support groups, and psychological counseling
- Research programs aimed at extending life expectancy
- Training programs integral to preparing future providers to offer the highest level of care

You can learn more about how to support the ACHDC by visiting heart.ucla.edu/ACHDC and clicking on “ways to give.”

To discuss specific gift options, or for more information, please call (310) 825-2019.

**SAVE THE DATE**

**Adult Congenital Heart Association 8th National Conference**

The theme for this year’s ACHA National Conference is *The Changing Landscape of Congenital Heart Disease*. The Conference offers a unique opportunity for the entire adult congenital heart disease community to come together. Patients, families, healthcare providers and researchers interact, learn, and build hope for the future.

**October 7-8, 2016**

**The DoubleTree by Hilton Universal Orlando, Florida**

To register and to find out more information, visit: www.achaheart.org/get-involved/events/8th-national-conference/
Two UCLA Congenital Heart Disease Patients Share Their Stories

Ken, Age 64, with Dr. Aboulhosn

Tetralogy of Fallot

I have been a patient at the Ahmanson/UCLA Adult Congenital Heart Disease Center since its inception in 1982. Let me tell you a little bit about my journey.

I was born in Youngstown, Ohio in June of 1951. Within days after being born, doctors told my parents that I was born with tetralogy of Fallot (hole in the heart) and that I would have a tough childhood — not be able to do what most kids do, like running around and sports. My family moved to California in 1953 and found a family doctor who advised my parents to go to City of Hope because they had a heart center and could possibly help. Help they did and in 1960 I had my first heart surgery — patching the hole and removing a valve. For the first time, I didn't have blue lips or fingernails after walking or exercise. This surgery allowed me to become a young adult and led what I thought was a pretty healthy life until 1982.

In the spring of 1982, the doctors at City of Hope changed their focus from cardiology to cancer, leaving me to find a new institution. I was referred to Dr. Joseph Perloff at UCLA, who had just started an adult congenital clinic, the first of its kind in the USA. Soon after, I had my first appointment at the UCLA Adult Congenital Clinic — my life would change forever and the UCLA team has been a part of my life ever since. Dr. Perloff was the first doctor who really told me what I had, what had been done before, and that I was going to need another heart surgery to replace the valve that was removed. The last thing on my mind at the time was another surgery. I was scared to death! He sent me to Dr. Hillel Laks for the surgery. In early 1983, I had my second surgery and it was a great success. Dr. Perloff and Dr. Laks later told me that the pig valve that was put in would last for only 10 to 15 years and I would need another surgery in the future. In 1994, married to the most beautiful woman in the world, my wife Laurie, and with two fantastic kids, Dustin and Haley, I again underwent a successful surgery with Dr. Laks to replace my pulmonary valve.

Starting in 2010, I began having more issues with my heart, and was in and out of the hospital many times for multiple reasons. This took a real toll on me and my family. In the spring of 2014, I ended up in the ER with major heart issues. That's when Dr. Aboulhosn suggested that I should consider a heart transplant. I said “WHAT?” That was the furthest thing from my mind, but my heart was failing fast - the wall was stiff and not pumping to its full potential, so I had to start looking at a transplant if I wanted to keep on living. In August, I again ended up in the ER at UCLA and barely made it. Dr. Aboulhosn and Pam Miner told me that I was not going home and that I needed to try to get on the list to qualify for a heart transplant. That Monday, the battery of tests began and on Friday I was lucky enough to get on the list. My family and I waited in the hospital until October 29th. After nearly three months in the hospital, I was frail, weak and depressed; and I had lost 100 pounds. On that day, Dr. Laks, gave me the gift of life, a new heart. Now when people ask me every day how I feel, I say I have never felt so good; I never had a normal heart before. What I do feel is that I am the luckiest man alive and every day is special.

If it were not for the UCLA ACHDC team, I would not be writing this story. These are special and dedicated people who have devoted their lives to saving thousands of others like me. Along with the doctors, there is a team of nurses headed up by Pam Miner, who in addition to being a nurse is the most compassionate person that I have ever met. I have been blessed to have them watch over me these last 30-plus years. The ACHDC team no longer follows me, the cardiomyopathy team just across the hall does — but I still get to see all of my extended family. In the spring of 2014, I ended up in the ER with major heart issues. That's when Dr. Aboulhosn suggested that I should consider a heart transplant. I said “WHAT?” That was the furthest thing from my mind, but my heart was failing fast - the wall was stiff and not pumping to its full potential, so I had to start looking at a transplant if I wanted to keep on living. In August, I again ended up in the ER at UCLA and barely made it. Dr. Aboulhosn and Pam Miner told me that I was not going home and that I needed to try to get on the list to qualify for a heart transplant. That Monday, the battery of tests began and on Friday I was lucky enough to get on the list. My family and I waited in the hospital until October 29th. After nearly three months in the hospital, I was frail, weak and depressed; and I had lost 100 pounds. On that day, Dr. Laks, gave me the gift of life, a new heart. Now when people ask me every day how I feel, I say I have never felt so good; I never had a normal heart before. What I do feel is that I am the luckiest man alive and every day is special.

Matt, Age 51

Transposition of Great Arteries

I was born in 1964 and was one of the first infants to survive a Mustard procedure for Transposition of the Great Arteries. All of my earliest memories are from Children's Hospital where I spent most of my first four years. My parents made great sacrifices to ensure that I made every doctor appointment and was given prompt medical attention at the slightest cold. They also made sure I never felt sorry for myself because of my medical condition.

In those days, there was not the extensive range of lifestyle education and training for young heart-surgery survivors. I want to say “we were on our own” but really “I was on my own,” save for the occasional checkup. I was the kid who could not play sports and would quickly tire out on long walks and during calisthenics. This led to some social alienation and my retreat was the library. I was the kid with the wisdom of mortality that usually comes much later in life and this gave me an appreciation for the absurd. When TV’s “The Six Million Dollar Man” was popular in the mid-1970s, I would pull up my shirt to show the other kids my scars from open-heart surgery and insist I was “Bionic.” At the beach I would show one particularly gnarly scar and explain that I had stopped swimming ever since I had gotten this shark bite.

Life went on … I learned which bad lifestyle choices to avoid, would always attack a cold immediately, never pushed it and knew to not physically
Patient Stories (continued)

overexert myself. Other than that, I had almost no symptoms. Later on I would discover what a gift this few-decades-long “vacation from reality” was.

My girlfriend (now my wife) prevailed upon me to get a checkup at UCLA’s ACHD clinic in 2006. I was wearing a Social Distortion t-shirt. Dr. Jamil Aboulhosn smiled and told me he had seen them live in concert back in 1989. I told him that I had seen them play a backyard party in 1979 and immediately felt like everything was going to be all right. For my condition, he told me I was in great health and would need only mild blood-pressure medicine, Lotensin, although I might one day need a pacemaker. The results of the Lotensin were great; life was never better.

However, in 2012, a week shy of my 48th birthday, I had a tachycardia episode that went on for over an hour. At a nearby ER my heart rate was found to be 196 beats per minute. The vacation from the reality of my condition was over; Linda Houser and Dr. Aboulhosn told me I would need a pacemaker.

The true miracle beyond the care that UCLA provided was that this tachycardia episode, which could have struck at any time, happened just three months after the Supreme Court had upheld the Affordable Health Care Act. As a self-employed writer and art curator, I would have been financially devastated and subject to inferior care if this serious episode had occurred at almost any other point in my life.

With my health insurance in order, I got that pacemaker implanted at UCLA on the day after Christmas. Dr. Aboulhosn and Dr. Kevin Shannon also performed an ablation after a transesophageal echo. After surgery, I was prescribed the blood thinner Pradaxa, from which I have suffered no side effects. My annual checkups have been great so far, and visiting UCLA is always a pleasant experience.

Life with a pacemaker is fine. I feel its little zap now and again but really only think about it when traveling thru airport security. I got a big break in the summer of 2015 when I auditioned for a TV show. The pilot for “Skin Wars Fresh Paint” had a successful airing and was picked up for an eight-episode first season. It premieres on the Game Show Network (GSN) this spring. Look for me as a judge in this body-painting art contest. The producers had my hair dyed blue for the role. Born as a blue baby, I feel I have come full circle.

Faculty Profile: Dr. Kevin Shannon

Kevin Shannon, MD, is a familiar face to many patients at UCLA. He has been the director of our pediatric and adult congenital electrophysiology program since 1993. He is a native of Cook County, Illinois, and attended medical school at Columbia University in New York. He completed his pediatric residency and pediatric cardiology fellowship at UCLA, providing the foundation for a long career at UCLA as a pediatric cardiologist, specializing in heart rhythm problems (electrophysiology). He has held multiple academic leadership positions at UCLA, and has served as the medical director for an annual mission to Arequipa, Peru to provide arrhythmia treatment to children in this underserved region. He has received a number of teaching awards and is widely published in peer-reviewed journals. In 1995, Dr. Shannon co-founded Camp Del Corazon, a residential summer camp for children with congenital heart disease. He has worked as the medical director of Camp Del Corazon for the past 21 years, spending two weeks every summer on Catalina Island with an incredible group of doctors, nurses, camp counselors and 300 lucky kids.

Jennifer’s FYI

This year, Covered California options for UCLA have expanded. There are now four Covered California plans (on the Exchange) that provide full coverage for care from UCLA Health and our physicians. You can also purchase these policies directly if you don’t want use the Covered California Exchange. If you have questions about insurance enrollment and options for coverage at UCLA, call (310) 794-5636.

Below are current options on the exchange that contract with UCLA:

- **Anthem Blue Cross PPO (Pathway X PPO)** – Individual plans: Bronze PPO, Silver PPO, Gold PPO and Platinum PPO
- **Blue Shield PPO** – Individual plans: Bronze PPO, Silver PPO, Gold PPO and Platinum PPO
- **Health Net PPO** – Small group plans: Bronze PPO, Silver PPO, Gold PPO and Platinum PPO
- **Oscar EPO** – Individual plans: Bronze EPO, Silver EPO, Gold EPO and Platinum EPO

Go to [coveredca.com](http://coveredca.com) or call 1-800-300-1506 to get more information on the Covered California plans.

ACHD Center Accreditation: Next steps for UCLA

The Adult Congenital Heart Association (ACHA) created an ambitious plan in 2010 to improve the quality of ACHD care in the U.S. with an accreditation program for ACHD centers. Six years later, the plan has become a reality. Starting in 2016 ACHA will award the designation of “Comprehensive Care Center” to the largest ACHD programs in the U.S. that satisfy a rigorous list of qualifications. This will afford patients, referring physicians and insurers crucial information in deciding where ACHD patients should be receiving their care. UCLA has submitted its application for accreditation and when approved, UCLA will be the first program in Southern California with this designation.
Focus on Supplements

Nutritional and Naturopathic Supplements: A Brief Overview

The supplement industry is a booming business in the United States and throughout the world. Approximately five years ago, total sales of herbal and dietary supplements in the U.S. were estimated to be 5.6 billion dollars, and this figure has likely grown. Whether used to ensure intake of essential dietary nutrients, improve energy, help with sleep, relieve pain, lose weight, improve memory, relieve symptoms of a cold or enhance sexual performance, supplements are used regularly or occasionally by a large number of Americans. Today’s dietary supplements include vitamins, minerals, botanicals, herals, amino acids, enzymes and many other substances. They are marketed in many forms, including pills, powders, gels, beverages and energy bars.

Plants have been used for medicinal purposes for thousands of years in all cultures. During the early 1800’s, nearly two-thirds of all entries in U.S. drug reference manuals were botanical substances. The use of herbal medicine declined in the early 1900’s, but experienced a resurgence in the 1960’s as part of a larger movement toward alternative medicine practices. In 1994, Congress passed the Dietary Supplement Health and Education Act (DSHEA), which allowed manufacturers to market their herbal products without requiring proof of safety or effectiveness. This allowed a further influx of herbal medications to the U.S. market. DSHEA placed dietary supplements in a distinct category from drugs. Labels of dietary supplements are required to state: “this product is not intended to diagnose, treat, cure, or prevent any disease.” However, product labels are allowed to make health claims, such as “promotes prostate health” or “supports the circulatory system.” Importantly, manufacturers of dietary supplements are not required to prove the effectiveness, quality or safety of their product prior to marketing them, nor are they required to report any adverse effects of the product once it has been placed on the market.

Evidence has shown that some supplements (such as vitamin D, calcium, iron, and omega fatty acids) can be beneficial for overall health. However, the majority of supplements are less studied and their effectiveness less certain. While the U.S. Food and Drug Administration (FDA) oversees the dietary supplement industry and has established standards for safe manufacturing, it is the responsibility of supplement manufacturers to ensure that their products are safe before they are marketed to the public. This includes making sure that products do not contain contaminants or impurities and are accurately labeled. Although the FDA is responsible for taking action against any modified or misbranded supplement product after it reaches the market, it does not review supplements for effectiveness as it does for prescription and over-the-counter medications. Because of this, the adverse effects and drug interactions associated with many supplements are unknown. Several independent organizations that offer quality testing allow products that pass these tests to display their seal of approval, though this seal of approval does not guarantee that a product is safe or effective. These organizations include U.S. Pharmacopeia, ConsumerLab.com, and NSF International.

When considering whether to take a supplement, you should investigate it carefully, particularly if you are taking prescription medications. Certain supplements may increase the effect of prescription medications and others may decrease it. Some can alter the way a drug is metabolized, absorbed or eliminated from the body and therefore affect its potency. For example:

- Agents such as garlic, ginseng, ginkgo biloba, cranberry, vitamin E and fish oils can affect blood clotting. Patients taking prescription blood thinners such as aspirin and Coumadin should use caution, as should patients who have active bleeding or upcoming surgery.

- St. John’s wort, popular for its antidepressant properties, can decrease the effectiveness of prescription drugs used to treat HIV/AIDS, high cholesterol, heart disease and depression. It can also alter the properties of oral contraceptives and Coumadin.

- Vitamin K, and products containing vitamin K, can decrease the effectiveness of Coumadin.

- Black cohosh, kava-kava, green tea extracts and mistletoe have properties that may be toxic to the liver.

- Valerian, kava and melatonin have sedative properties and should not be combined with prescription sedatives or alcohol.

- Medical marijuana is increasingly used for potential health benefits, such as relief from pain and nausea, reducing the suffering from migraines, and preventing progression of glaucoma. However, marijuana can also be associated with abnormal heart rhythms and in some cases heart attacks, so caution is warranted in cardiac patients.

- Grapefruit has potential health-related benefits, including the treatment of high cholesterol, however there are multiple drug interactions with grapefruit that can impact medication potency, including warfarin, losartan, statins, carvedilol, sildenafil, and quinidine.

Because of lax labeling laws, many supplements can make exaggerated or even false claims of efficacy. Beware of promises of a quick fix (lose 10 lbs. in a week!), use of the words “guaranteed” or “scientific breakthrough” or products that are marketed as herbal alternatives to an FDA-approved drug or as having effects similar to prescription drugs.

You should inform your healthcare practitioners about supplements you are taking — or want to start taking — to determine whether it is safe to do so in the context of specific medical conditions and/or prescription medications. Shared information and mutual decision making on adding a supplement provides the best chance of achieving maximal benefit with minimal risk.
Focus on Advance Directives

In Sickness and in Health: Advance Directives

As a patient, you have the right to take an active role in your own healthcare. Unfortunately, there are circumstances, such as an acute illness or accident, when such control may not be possible. In order to ensure that your healthcare wishes are honored in the event you cannot communicate them yourself, it is essential that you complete an advance directive. Contrary to the common belief that advance care directives are only needed by the elderly or terminally ill, all people, young and old and in all stages of health should consider completing this important document.

Advance directives are written instructions that you prepare to help guide your medical care. They take effect when a doctor determines that you are no longer capable of making your own decisions regarding your care. One common directive is a living will, in which you define what medical treatments you do or do not want. This can include your wishes on such treatments as cardiopulmonary resuscitation (CPR), whether to be placed on a breathing machine (mechanical ventilator), kidney dialysis, medications, tube feedings and intravenous fluids. Another common directive is to name a medical power of attorney, also known as a health care proxy or agent to make decisions on your behalf.

Advance care directives vary from state to state. The California Advance Health Care Directive is a legal document designed to protect your right to refuse medical treatment that you do not want and to specify the treatment or treatments that you do want. There are five parts to the document. First, there is a Power of Attorney for Health Care, in which you may designate someone to make decisions about your health care when you cannot. This person, or agent, may be a spouse, family member, or close friend, but should be someone who knows you well, clearly understands your wishes and is willing to accept the responsibility of making medical decisions for you. You can appoint a second and third person as your alternative agent(s) if you wish. The second part includes your individual instructions. This is your living will, in which you state your wishes about the type of health care you want in the event you can no longer speak for yourself if (1) you are terminally ill, (2) you are permanently unconscious and/or (3) the likely risks and burdens of continuing medical care outweigh the expected benefits. Part three allows you to express your wishes regarding organ donation. Part four allows you to designate a physician to have primary responsibility for your healthcare if you so desire. Part five requires your signature and the signature of two witnesses or a notary public. You may fill out any or all of parts one through four, but you must complete part five.

After you have completed and signed the form, photocopy and give it to the person you have appointed to make decisions on your behalf, your family, friends, healthcare providers and/or spiritual leaders so the form is available in the event of an emergency. You may also wish to consider saving a copy of the document in an online personal health records program that allows you to share your medical documents with your physicians, family, and others who you want to take an active role in your advance care planning. If you want to make changes after the document has been witnessed and signed, you must complete a new document. The document can be revoked by you at any time.

For some, preparing an advance directive may not be easy, since the process inevitably involves giving thought to difficult issues including envisioning oneself in a medically vulnerable or helpless state and ultimately considering one’s own death. However, careful planning and discussions with loved ones and your medical team while you are feeling and doing well can ultimately provide all parties with peace of mind that your voice will be clearly heard should an emergency or sudden change in your health occur. The Adult Congenital Heart Association recommends that all ACHD patients, regardless of their state of health, engage in conversations with their medical team regarding completing an advance directive. In fact, several studies have demonstrated that many ACHD patients favor having this discussion earlier in their care rather than later.

Remy, the anthropomorphic rat in Disney’s Ratatouille notes, “The only thing predictable about life is its unpredictability.” Regarding our health, all of us must therefore do our part to be as prepared as possible for the unexpected turns in the road.
The Ahmanson/UCLA ACHD Center continues to propel the field of congenital valve replacement via both surgical and newer, less invasive, transcatheter techniques. We have previously reported on use of the Melody® valve with the first implants at UCLA in October of 2010. Since that time the UCLA congenital catheterization laboratory has become one of the busiest transcatheter valve implantation program in the United States with over 160 successful implants of all four cardiac valves (tricuspid, pulmonary, mitral and aortic). In addition to the Melody® valve we have utilized the Edwards Sapien® valves in all four positions. The Sapien XT® valve has recently been FDA-approved for treatment of dysfunctional pulmonary conduits. Due to their larger size, the Edwards Sapien® valves allow patients who would previously have required open-heart surgery to undergo a less invasive form of heart valve replacement. Drs. Aboulhosn and Levi have developed novel valve deployment techniques that facilitate valve replacement procedures in the most difficult cases (Figure A). In addition to replacing heart valves, UCLA physicians are now also repairing leaky valves by using a mechanical clip deployed using a catheter that is threaded from a vein in the leg. The Mitraclip® system has been successfully used to repair leaky mitral valves by clipping two of the leaflets together (Figure B). Patients at the Ahmanson/UCLA ACHD Center are benefiting from minimally invasive valve repair and replacement technologies that help them avoid open heart surgery, recover more quickly and return home within 24 hours of the procedure.

Figure 1 - A) 3-D printed model of the right ventricular outflow tract and pulmonary artery of a patient with repaired tetralogy of Fallot. A wire and has been placed across the pulmonary valve and a Sapien transcatheter valve is being advanced over the wire. B) Balloon dilation of a Sapien transcatheter pulmonary valve.

Figure 2 - Use of the Mitraclip for repair of leaky mitral valve.

Figure 3 - Advanced MRI imaging techniques using iron infusion to better visualize anatomy in 3-dimensions.

Advanced Imaging and 3-D Printing Technology

Many patients with CHD undergo magnetic resonance imaging (MRI) of the heart to help doctors better visualize their anatomy and quantify their heart function. UCLA physicians are now employing a new technique that uses infusions of small amounts of iron into an arm vein to allow startlingly clear 3-D digital models (Figure 3). These digital 3-D images can then be printed as 3-D models. Drs. Aboulhosn and Levi have used these models to plan interventions and such as valve replacement or stent placement procedures before performing the actual procedure on patients.

The link below demonstrates how 3-D printing was recently used to successfully facilitate a tricky valve implantation: [www.uclahealth.org/news/ucla-doctors-use-3-d-printed-model-to-guide-tricky-heart-valve-replacement](http://www.uclahealth.org/news/ucla-doctors-use-3-d-printed-model-to-guide-tricky-heart-valve-replacement)