New intravascular temperature management system for Cardiac Arrest victims

- Pomona Valley Hospital introduces new system to help saves lives -

(Pomona, CA  12-06-10)   Pomona Valley Hospital Medical Center (PVHMC) is the first hospital in Eastern San Gabriel and Western San Bernardino Valleys to offer hypothermia management, better known as Targeted Temperature Management, to save the lives of patients suffering cardiac arrest. This new system will rapidly, safely and effectively manage the core body temperature of critically ill patients following a witnessed cardiac arrest.

Temperature is one of four main vital signs, yet for some patients in specific instances, temperature can be detrimental. Now, thanks to a new medical therapy and a new temperature management system, PVHMC patients are being cooled from the inside out, thereby helping to save lives.

Seventeen-year-old Cesar “Ryan” Tungol of Walnut knows just how valuable a controlled temperature, following a cardiac arrest, can be. He is alive today thanks to quick-thinking minds and the rapid response of a specially trained, emergency response cardiac team – the POLAR ALERT team - at PVHMC.

For Ryan, this past Aug. 27 started out as a fairly normal school day for the high school senior. It ended with Ryan intentionally sedated with a core body temperature of just 33ºC.
Ryan left school mid-morning, per his mother, Heidi’s, instructions, so they could go together to the oral surgeon’s office where Ryan was scheduled to have four wisdom teeth pulled.

Heidi left Ryan in the hands of the oral surgeon and his staff, and settled in to the office’s lobby until the extractions were completed. Twenty minutes later she observed some commotion in the lobby and “first I saw three paramedics, then four, and I started to panic,” said Heidi.

“I turned to a nearby couple to inquire about what was happening and they shared that they ‘had heard of a highly allergic reaction,’” she continued. “I ran to the door of the oral surgeon’s office and began banging on the door.”

Soon the door was answered by a staff person within the surgeon’s office and they pulled her into a room, embraced her, and told her “the only thing we can do now is pray.”

One of the paramedics came to her shortly and confirmed that Ryan had suffered a lethal cardiac arrhythmia (a deviation of the normal rhythm of the heart) leading to a cardiac arrest. When he told her, Heidi collapsed in a nearby chair.

Heidi remembers all the commotion around her as paramedics were moving between their rig and the office. In her panic Heidi asked “is he dead?” to which the paramedic replied “they’re working on him ma’am.” What Heidi didn’t yet know was that the oral surgeon and his team had already performed defibrillation shocks to Ryan, as other staff were calling the paramedics.

Then – as the paramedics rushed into the oral surgery suite - the first thing they saw was what turned out to be young Ryan’s second cardiac arrest of the day. Paramedics then administered a second round of defibrillation to Ryan’s heart.
Minutes later Ryan, unconscious and on a stretcher, emerged from the surgeon’s office. Heidi reached across to Ryan as the stretcher was approaching the ambulance, kissed him arm saying “we’re here for you. Don’t go; don’t leave.”

The young man was then loaded into the ambulance, bound for Pomona Valley Hospital Medical Center and its POLAR ALERT team. “I’m convinced that Ryan fought to not leave us,” says Heidi.

Once at PVHMC Heidi and her husband, Cesar, saw first-hand how the POLAR ALERT program at PVHMC saves lives. Dr. John Lee, a PVHMC Emergency Department physician, sat with Ryan’s parents and explained the new procedure, Intravascular Therapeutic Temperature Management™ (IVTM), for which Ryan was a candidate. Heidi turned to Dr. Lee and implored “please save my son; do what you can.”

Ryan was among the first of several patients where PVHMC’s clinical staff had determined that IVTM had the potential to not only save lives but to minimize the potential side effects and long-term complications of a cardiac arrest.

The choice of the Hospital’s medical staff to begin utilizing IVTM was well researched and painstakingly implemented by staff from the Emergency Department and Cardiac Services, including a team of nine physicians – Cardiologists Drs. Tom Moy, Muthusamy Muthiah, JP Reddy, and Rama Thumati; Intensivists/Pulmonologists Drs. Heather Davis, Nadir Eltahir, Gurbinder Sadana, and Rakesh Sinha; and, PVHMC’s Vice President of Medical Affairs and Emergency Medicine specialist Dr. Kenneth Nakamoto.

Ryan was urgently transported to the Cardiac Intensive Care Unit to begin IVTM. A team of specially-trained physicians, nurses and respiratory therapists worked to save Ryan’s life. “It was the team working together that made this happen,” stated Dr. Thumati, medical director of Cardiac Services at PVHMC. “Our nurses follow strict protocols to assure we provide the highest standard of care for our patients,” says Deborah Keasler, RN, director of Cardiac Services.
IVTM regulates core body temperature by precisely cooling (or warming) critically ill and surgical patients from a variety of medical conditions. As in Ryan’s case, the process of cooling the body limits potential brain injury as a result of the cardiac arrest.

IVTM provides cooling and warming from a central catheter inserted into the patient’s vein. Unlike external cooling methods (i.e. ice packs, cooling blankets, gel pads, etc.) IVTM provides better control of core body temperature by directly cooling (or warming) the patient’s blood as it circulates through the body.

After a period of therapeutic hypothermia, typically 12-24 hours, the system slowly and accurately rewarms the patient back to normal body temperature. Since the saline flows only within the catheter, no fluid is infused directly into the patient and no blood leaves the body via the catheter. The patient is heavily sedated and closely monitored.

For Ryan, the induced IVTM catheter was in place for approximately 36 hours when his body was rewarmed, slowly at 0.25ºC per hour. “Dr. Muthiah began calling his name “Ryan, Ryan, Ryan” and he began to move his eyelids. Heidi claims she thought “…my heart would stop” at this time. In response nearby PVHMC staff began doing the thumbs up gesture and “high 5s” overhead.

Today, Ryan has resumed most of his previously active lifestyle. The high school senior is back in school, enjoys his time playing golf, and the time he spends with his girlfriend. However, he is still restricted from any contact sports. Ryan is also dealing with the emotional roller-coaster of facing the fact that he experienced a near-death experience and BEAT IT - something no 17-year-old should ever have to face.

Heidi Tungol has indicated that the entire situation is baffling yet Ryan has survived against incredible odds. She credits Ryan’s will to live and the prompt responsiveness of the PVHMC POLAR ALERT team, the availability of the Intravascular Temperature Management system and the staff at PVHMC, especially the Cardiac Services department.
As for the future, the Tungols monitor Ryan carefully and make certain he has his medications, regularly consults with his doctors and adheres to their advice.

In discussing Ryan’s future there is no certainty if this cardiac condition will reoccur. Doctors have said that perhaps in the future Ryan will need a pacemaker. “Maybe when he’s older if there’s evidence of the need for that surgery,” says Heidi. “The process could be detrimental. We have to rely on the results and further testing.”

One question lingers in Heidi’s mind. “Why don’t other hospitals have this (equipment?),” asks Heidi. “I don’t want to think about it.”

In late Sept. Heidi wrote a letter to the Hospital’s Cardiac Intensive Care Unit and the ER staffs saying “…Words cannot fully express our sincere gratitude to all of you for caring and nursing our son Cesar Ryan back to our lives. We don’t know if we will ever be able to thank you enough for the care he received from the doctors and nurses during this traumatic and difficult time. Though Ryan is still undergoing several follow-up tests, he is recovering well…”

In the meantime, PVHMC and its Stead Heart and Vascular Center are proud to be the region’s first to provide this life-saving medical therapy and technology, and continue as a trusted source for heart and stroke care.

About Pomona Valley Hospital Medical Center –
Pomona Valley Hospital Medical Center is a 453-bed, acute care, nationally accredited hospital serving the greater Pomona Valley. It is one of only 227 hospitals in the country to be named a recipient of the HealthGrades 2010 Outstanding Patient Experience Award. PVHMC has also been recognized nationally as a Benchmark Hospital by Thomson-Reuters for earning the 100 Top Hospital designation four times in the list’s thirteen-year history; PVHMC is one of only two California hospitals given this Benchmark distinction. For more information please visit our Web site at www.pvhmc.org.

New Medical Code Mirrors Initial Alert
- POLAR ALERT functions much like STEMI Alert Team -
The new POLAR ALERT process at Pomona Valley Hospital functions much like the STEMI Alert team which was implemented in 2006 at PVHMC. When a STEMI Alert code is announced overhead in the hospital a pre-identified team jumps into action. Staff immediately report to the Emergency Department (ED) to begin preparations for an incoming patient who has been identified in the field as suffering from a specific type of heart attack, an ST-elevated myocardial infarction (STEMI).

The patient is first assessed by paramedics, transported to a STEMI Receiving Center hospital — as determined by that county’s Department of Public Health — and met by the waiting team of doctors, nurses and other clinical specialists in the hospital’s ED.

With STEMI patients, they are immediately prepped in ED and taken to the Cardiac Cath Lab where cardiologists are waiting to begin the process of balloon angioplasty. A catheter inserted within the patient identifies blockages within the heart’s blood vessels. A stent is then inserted to hold the walls of the vessel in place to prevent future blockages. Patients treated within the “golden window”, or 90 minutes between their entry into the ED and completion of the angioplasty, are less likely to experience any cardiac complications.

The clinical STEMI team is assisted by many others in the hospital, from behind-the-scenes, that are minutely trained in their specific roles. From the hospital’s telecommunications operator, who first initiates the overhead STEMI Alert code, to a member of the hospital’s security team who has a prearranged elevator ready and empty, with the door open, to rapidly transport the patient from the ED to the Cath Lab upstairs, everything is done to expedite the patient’s emergency care.

The POLAR ALERT team mirrors the STEMI team’s precision, speed and clinical expertise. As medical technologies continue to develop, hospitals acquire the newest proven equipment, and physicians and other medical specialists are educated and trained for the cutting-edge procedures, more patients' lives will be saved with no untoward long-term complications.
The IVTM process and the POLAR ALERT team are Pomona Valley Hospital's newest technology and procedure in their commitment to saving lives and meeting the medical needs of the community.