LIFE STAR LINES

HARTFORD HOSPITAL

A Hartford Hospital publication addressing articles of interest to emergency and critical care personnel

Vol. XVI No. 3, Spring 2007

camts

CASE STUDY: Hypothermia

By Sara Sonstroem, RN, EMT-P

At 6:00 on an extremely cold morning in January, a 53 year-old woman was found lying in a snow bank outside her home. Her husband reported last seeing her at approximately midnight the previous evening. Ambient temperature was approximately 15°F through the night. EMS arrived to find the patient with a GCS of 3, faint carotid pulses and agonal respirations. BVM ventilation and resuscitation with warm IV fluids was initiated during transport to the nearest medical facility, a local walk-in clinic. At the clinic, the patient had a core temperature of <84°F (84 was as low as the temperature probe would register). She was intubated and CPR was started when she deteriorated into pulselessness. LIFE STAR was activated to transport this patient from the clinic to a tertiary care center with cardiac bypass capabilities.

When the helicopter crew arrived, the patient had been in arrest for approximately one hour. She had been defibrillated 8 times and received 7mg of epinephrine and 3 mg of atropine, yet she remained in a slow, wide-complex PEA alternating with asystole. She had no measurable end-tidal C02. She was resuscitated with 3500cc of warm crystalloid via a femoral cordis, was covered with a Baer Hugger warming blanket, and gastric and urinary catheters were inserted and irrigated with warmed fluids. Warm packs were placed in her axillae and groin. Return to a narrow complex rhythm now generated a faint pulse.

Active and passive re-warming efforts were continued in flight. The patient had 3 more episodes of slow, wide-complex PEA arrest during the 15 minute flight. Each time she arrested, CPR was initiated and 1 mg of IV epinephrine was given, with return of pulses within 15 seconds. She was brought directly to the OR where active core re-warming was started.

The patient remained in the OR for over 3 hours and was then was transferred to ICU. Within 48 hours she was extubated and ambulatory, and within a week, she was discharged home with absolutely no discernable neurological deficits. She has since called the clinic, flight crew, and tertiary care hospital to thank them for saving her life and "not giving up on her".

DISCUSSION:

There are three stages of hypothermia, and clinical presentation varies with each stage. Mild hypothermia is defined as body temperature greater than 34 degrees C (93.2 F). Hypertension, shivering, tachycardia, tachypnea, and vasoconstriction are often seen. As fatigue sets in, the patient will become apathetic, ataxic, and judgment will become impaired. Care of the mildly hypothermic patient should concentrate on preventing further heat loss and passive external rewarming with warm blankets. Wet garments should be removed and the patient should be shielded from further environmental exposures.

Moderate hypothermia develops when core temperature falls between 30C and 34C (86 to 93.2 F). The patient can have atrial dysrhythmias, slowing of the heart rate and respiratory rate, decreased reflexes and level of consciousness, dilated pupils, and cessation of shivering. Patients who have maintained a perfusing rhythm should be treated with active external warming such as forced hot air, radiant heat, and warm packs.

Severe hypothermia occurs when core temperature falls below 30 C (86 F). Apnea, coma, non-reactive pupils, oliguria, pulmonary edema, and ventricular dysrhythmias or asystole are common findings. Since circulation is dramatically impaired in cases of severe hypothermia, repeated dosing of vasoactive agents may result in toxic accumulation of the drug peripherally with rapid delivery of the high dose into the cardiovascular system once re-warming begins and spontaneous circulation resumes. For this reason, the AHA recommends that only one round of ACLS drugs (via a central line if possible) and one defibrillation attempt (if indicated) be given until the patient's core temperature reaches 30 degrees C. BLS/CPR should continue until patient is warmed or regains a pulse. Myocardial irritability from hypothermia can be lethal. Careful intubation if needed and gentle patient handling are essential to avoid dysrhythmias.

This case reflects a positive patient outcome for severe hypothermia following the current AHA guidelines for hypothermia care. It also illustrates the need to continue resuscitation until the patient has been adequately re-warmed. Rapid transport to a tertiary care center with cardiac bypass re-warming capabilities should be considered in cases of severe hypothermia. LIFE STAR is an appropriate transport option.

Ventricular Assist Devices

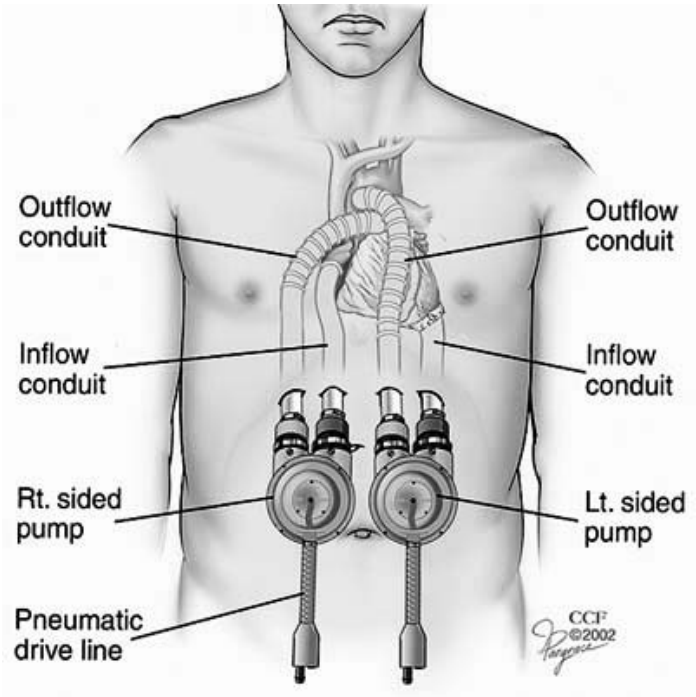
By Jeremy Kriner, RN, EMT-P

Ventricular Assist Device (VAD) technology has become an important and effective bridge to heart transplant for patients with severely compromised ventricular function. Today's VAD technology completely replaces the failing ventricle(s) with a compact, sophisticated pump that can provide adequate cardiac output for weeks or even months if needed. VAD's have become so advanced that patients waiting for a new heart can now be discharged home on this device. Some of these patients are waiting in our community.

Why would a patient need a VAD? Many undergo a VAD placement because of an idiopathic cardiomyopathy or cardiomyopathy due to ischemic heart disease or valvular heart disease among other causes. Some patients receive a VAD after failing medical management of congestive heart failure; others may have placement due to failed attempt to come off a cardiac bypass pump after a CABG.

When you see a patient with a ventricular assist device, you will notice only a few things on the outside. The patient will be carrying a console; several brands exist. He/she will also have a bag with extra batteries and a bulb type device for emergency pumping. Under the clothes you will notice one or two small hoses coming out from the skin, hoses that connect to the console. The actual pneumatic pump is placed in the chest and cannot be seen. This pump consists of a prosthetic ventricle with a smooth pumping chamber enclosed in a rigid case which holds a stroke volume of 65cc of blood. The prosthetic ventricle can function for the right ventricle (RVAD), the left ventricle (LVAD), or both (BIVAD).

Once a patient has a VAD placed, health care providers must remember that this patient is completely dependent on this device to provide a pulse! **NO VAD PUMPING = ASYSTOLE**. Even though VAD pump failure is very rare, VAD patients and their family members go through an extensive training program that includes emergency and routine VAD management procedures. In an emergency, the patient or family is the best resource for health care providers. Basic troubleshooting of the VAD includes evaluating the system to see if there has been a battery malfunction or an entire system shutdown. If the pump is not working, **DO NOT do CPR**. Manually pumping the VAD using a specific bulb device is the only option for generating cardiac output for these patients until a facility capable of providing definitive care can be reached. Defibrillation is acceptable if needed, but remember not to perform CPR. Remember that electrical activity never equals mechanical activity in these patients.



There are very few hospitals in New England that are capable of placing and troubleshooting VAD technology. **Patients experiencing a serious VAD-related problem have an emergent need for rapid critical care transport to the center that originally placed the VAD,** typically in Boston or New York. LIFE STAR can be a valuable direct transport option from the scene or community hospital to the specialty center.

This article was written to provide only a brief overview of the ventricular assist device (VAD), how it functions and simple ways to troubleshoot the system until definitive repair can be accomplished. As more patients are discharged home with VAD technology in place, it is important that all health care workers develop a basic familiarity with this amazing technology.

Photo courtesy of B. Meehan

On the Scene ...

LIFE STAR responds with Washington Ambulance to aid an injured motorist.

News Briefs

Landing Zone Review

When establishing a LIFE STAR landing zone, please note that the LZ size requirement has been changed to 85ft x 75ft, slightly larger than the previous 60ft x 60ft dimensions.

New Chief

After two years of service as the Chief Flight Nurse, Jim Marcelynas has resigned from this role to pursue a career as a nurse anesthetist. Lisa Duquette, RN has been selected as the new LIFE STAR Chief Flight Nurse. She has been with the program for 8 years.

New Chief Respiratory Therapist

LIFE STAR is pleased to announce Tricia Lohan, RRT, EMT, as the new Chief Flight Respiratory Therapist. She has been with our program since 2001. She is responsible for coordinating LIFE STAR respiratory care duties and serves as the performance improvement workgroup administrative liaison.

Contact Info

Feel free to email us at LIFESTAR@harthosp.org, to ask general questions about the program or to provide feedback on our operation. We look forward to hearing from you!

For questions about merchandise or catalog, please contact the:

LIFESTAR Communications Center
(860) 545-4369 or
Barker Specialty directly
1-800-BARKERS (227-5377)

www.harthosp.org/lifestar

Please visit the LIFE STAR website at www.harthosp.org/lifestar. The site contains up-to-date general LIFE STAR information, a listing of job opportunities within the program, and several easy links to scheduling an event or ride-along time.

Promotional Events

Are you interested in doing a drill or having a LIFE STAR safety presentation? Please call (860) 545-4369 to schedule your event. Please give us three possible dates at least ONE MONTH in advance. Our crew needs ample time to accommodate your requests! Training is the key to safety.

LIFE STAR Alumni

We would like to keep in touch with you. Please email Patricia Lohan at plohan@harthosp.org with your current mailing address and email. If you know anyone who has not received this current issue of LIFE STAR LINES, please pass this information to them.

Industry Honor

Dawn Filippa RRT, EMT-P was recently inducted by the American Association of Respiratory Care as the AARC's Surface and Air Transport Section Chair. Pictured is Steve Sittig, outgoing Section Chair, presenting Ms. Filippa with a golden laryngoscope at the 52nd International Respiratory Congress. Ms. Filippa is currently a Senior Flight Respiratory Therapist at LIFE STAR and has been with the program since 1992.

Industry Honor

Flight Nurse Michael Frakes has been elected as a Director-at-Large to the Board of directors of the Air and Surface Transport Nurses Association (ASTNA). His term will run until October 2008. In this role, Michael represents member interests to the Board of Directors and acts as a liaison to the ASTNA Research Committee.

LIFE STAR Lines Staff:

Editor: Lisa Duquette, RN
Nicole Wilson, Communications Specialist

Medical Director: Kenneth Robinson, MD, FACEP

Advisory Board: Jim Marcelynas, RN, Chief Flight Nurse
Lee Monroe, Director of Public Relations

Printing Advisors: Reginald Leonard, Director of Printing Services
Sal DiNino, Graphic Designer

Aviation services provided by Air Methods Corporation QMLA253U

New Crew Members

Flight Respiratory Therapist

Matt Branconnier, RRT, EMT

Matt brings 10 years of experience as a respiratory therapist to the LIFE STAR team, including several years experience at Massachusetts General Hospital. He holds an Associate Degree from Springfield Technical Community College and joined LIFE STAR in December 2006.

Communications Specialist

Michelle DellaGuistina

Michelle has 9 years of EMS experience including 2 years as a dispatcher at AMR. She joined the LIFE STAR team in December 2006.

Communications Specialist

Theresa Collins

Theresa joined LIFE STAR in December 2006. She has a degree in Criminal Justice and has been a security officer at Hartford Hospital for 18 years.

ADDRESS SERVICE REQUESTED

80 Seymour Street
PO Box 5037
Hartford, CT 06102-5037

HARTFORD HOSPITAL
LIFE STAR

NON-PROFIT ORG
U.S. POSTAGE
PAID
PERMIT #4361
HARTFORD, CT