For individuals with sudden loss of oxygenated blood flow, especially those subsequently resuscitated from cardiac arrest, return of circulation can actually exacerbate injury to the brain. But advanced emergency departments have begun to use therapeutic hypothermia to prevent or minimize this permanent or fatal neurological damage that resembles the sequelae of stroke. To lessen the degree of brain injury in patients who have suffered severe brain hypoxia followed by reperfusion, Lourdes put successful hypothermia protocols in place in 2007.

“This therapy increases survivorship and improves outcomes,” says Alfred Sacchetti, MD, FACEP, chief of emergency services at Our Lady of Lourdes Medical Center in Camden.

Even with the best CPR, the brain becomes hypoxic within a few minutes of cardiac arrest or similar event. But return of blood flow often brings added insult to brain tissue, as a function of free radical production, excitatory amino acid release and calcium shifts. Mild hypothermia slows metabolism and suppresses many of these chemical reactions.

Survival and favorable neurologic outcome increase significantly for extended cardiac-arrest patients treated with therapeutic hypothermia.

The team places the individual under sedation and cools the patient to lower the body temperature several degrees below normal for up to 24 hours. Then, the staff permits the patient’s body temperature to gradually return to normal, during which time the patient typically regains full consciousness (see case study, page 3.)

Emergency departments may employ a number of approaches to reducing a patient’s core temperature. Newer programmable systems for monitoring and controlling body temperature (see figure) are easily applied, and are mobile from the emergency room or cardiac-care unit.

After initial tentative use in the last century, hypothermia received increased attention in recent decades, including in studies in 2002 from Europe and Australia that found cooling dramatically reduced death and disability in patients who suffered cardiac arrest outside hospitals. Centers in the U.S. have reported similar results, with survival and favorable neurologic outcome significantly increased for cardiac arrest patients treated with the therapy. The findings prompted the American Heart Association in 2005 to include therapeutic hypothermia in its guidelines for treating cardiac arrest patients. The strategy also finds application in other types of acute events causing prolonged anoxia in the brain.

For more information, or to refer a patient, call 1-888-LOURDES
Constant Inv. Card. Improvement
Daily audits with inpatients. A no-fail system of phone (and visit) follow-up after discharge, including for same-day-procedure patients. One-on-one, group and staff meetings after care aberrations. Training videos and timely in-services aimed at prevention. All of these steps—as part of a highly structured performance improvement program in interventional cardiology—have contributed significantly to recognition that Lourdes has attracted in recent years for these services.

Says improvement coordinator Asuncion (Sony) Teung, RN, MA, “Our team process is proactive, practitioner and staff driven, concurrent and data based, with real-time feedback and adjustments.”

Using nationally established goals, benchmarks and metrics, the program seeks outcomes that define a top-quality program. For all procedures in the catheterization and electrophysiology labs, the program creates care maps—pathways from entry to exit with standardization that is evidence based.

Working with the nurse manager and care manager—as well as physicians, nurse practitioners, fellows and other staff—Teung examines and shares any adverse events and corrective actions, as well as positive news, with the staff as soon as possible. Accolades that the service has garnered (see “More Honors,” right) demonstrate the difference that such a robust quality-control process can make.

More Honors for Cardiac and Stroke Services
Adding to its Excellence Award in coronary intervention, Lourdes has also now received this same award for its overall cardiac services and for its stroke services. HealthGrades®, the leading independent healthcare ratings organization, recently released its 2011 results, which also include these Lourdes distinctions:

CARDIAC SERVICES
• top 5 in New Jersey and top 10 percent in the nation
Cardiology Services
• five-star rated and top 4 in New Jersey, including for interventional procedures
Heart Attack
• five-star rated
Cardiac Surgery
• top 10 in New Jersey
• five-star rated for coronary bypass surgery
Heart Failure
• five-star rated

STROKE SERVICES
• five-star rated

VASCULAR SERVICES
• top 2 in New Jersey
• five-star rated for aortic artery aneurysm

BARIATRICS
• five-star rated and top 5 in New Jersey

Also in the news:
• Last spring, Lourdes Health System opened the Lourdes Emergency Department at DEBORAH®, at Deborah Heart and Lung Center, in Brown Mills, NJ.
• In August, the State of New Jersey named Lourdes Medical Center of Burlington County a Primary Stroke Center. Our Lady of Lourdes Medical Center enjoys the same distinction, and this year also received the Get With The Guidelines® Stroke Gold Plus Performance-Achievement Award from the AHA/ASA.
Robert Ball arrived home late from his part-time work as a paramedic in the early morning of January 9, 2008. Feeling tired, Ball, 48, failed to apply the continuous positive airway pressure (CPAP) system that he uses as treatment for his sleep apnea. His snoring became so loud that his wife left the bed. When she returned, she was, at first, pleased to hear that his snoring had ceased but then horrified when she realized he was unresponsive. She called 911 at 3:20 a.m.

A nearby police officer and an off-duty EMT responded first. They initiated CPR and then applied an AED, but the device did not detect correct conditions for administering a shock. Ambulances with basic and advanced life support crews arrived at 3:23 a.m. to find the patient warm but cyanotic and unresponsive, with no pulse. The heart monitor showed atrial fibrillation.

Anoxic for at least seven minutes, the patient recovered his faculties almost fully.

The team intubated the patient, administered 1 mg of I.V. epinephrine and continued CPR. By 3:30, the patient had achieved spontaneous circulation again, with strong radial pulses and agonal breaths. The crew rapidly transported the patient to the emergency department at Our Lady of Lourdes Medical Center.

The staff in the ED recognized that even though Ball had a return of his vital signs, he was still very much at risk for long-term, permanent brain damage. The return of oxygen to a deprived brain can cause as many problems as the lack of oxygen. To prevent this, the ED instituted a hypothermia protocol that cooled Mr. Ball’s body temperature to 94 degrees. The staff continued this post-resuscitation hypothermia in the CICU.

The specialists medicated the patient to prevent shivering. They maintained the low body temperature for eight hours and then slowly returned it to normal. Attended by neurologists, pulmonologists and cardiologists, Ball began to partially and intermittently regain consciousness during this time.

The Lourdes team monitored the patient over the next three days. When he fully regained consciousness, Ball could recall only hallucinations and dreams with regards his hospital stay to that point. He began to reorient more fully and interact more normally with his wife and visitors.

Testing confirmed that a severe episode of sleep apnea alone had caused his cardiac arrest. The incident did not appear to compromise his cardiac function, and the team discharged him on January 18.

Ultimately, Ball lost memory only of the month preceding his hospital care. He has otherwise made a strong recovery, experiencing only minor problems with balance and isolated cognitive tasks. He has made a complete return to his full-time job in the bio-chemical field and has since retired from his part-time work on the EMT squad. Ball credits expeditious emergency care and prompt hypothermic treatment with saving his life and accounting for his near-complete recovery.

Today, Ball—whose father suffered from sleep apnea and passed away at age 62—never fails to use his CPAP system at nighttime. The mobile intensive-care units with which he formerly worked, and which supply advanced life support in Camden County, are now working to institute a hypothermia protocol for patients, in the field and in transport, who have suffered extended brain hypoxia.

For more information, or to refer a patient, call 1-888-LOURDES.
WITH THE DIFFERENT TYPES OF CARDIAC STRESS TESTS, HOW CAN I KNOW WHICH IS THE RIGHT ONE TO ORDER FOR MY PATIENT?

Not uncommonly, patients arrive referred for one type of stress test when another is better indicated for their condition. Briefly stated, a regular exercise stress test is fine for patients who have a normal ECG but signs of or risk factors for CAD. For patients who have abnormal or equivocal results on this test, are diabetics or have an abnormal ECG, a nuclear stress test can help to identify the areas of the heart experiencing ischemia. For patients with poor exercise capacity unable to achieve target heart rate, or who are unable to walk on a treadmill or have a left bundle branch block, a chemical nuclear stress test is the best option.

The chemical agent can vary by center or protocol. An alternative is stress echo, which in experienced centers has a similar sensitivity and specificity to nuclear testing for ischemic heart disease. Stress echo can also show ventricular wall motion and screen for valvular heart disease. It is indicated for the individual who can achieve target heart rate and whose body allows adequate echo images. Chemical stress agents such as dobutamine work for patients with reactive airway disease, and PET imaging has an expanding role for diagnosis of ischemic heart disease; but, and PET imaging has an expanding role for diagnosis of ischemic heart disease; but, these latter options should be reviewed first in consultation with a cardiologist.

The excimer laser is indicated for:

- total occlusions traversable by a guide wire;
- fibrotic plaque;
- lesions that fail balloon angioplasty.

Our Lady of Lourdes Medical Center now uses the excimer laser to quickly and safely restore coronary blood flow in the cath lab for acute myocardial infarction (MI). Already making successful use of the “cool” laser for coronary and peripheral artery disease, as well as for lead management, the team has gained recent success in applying the technology to the MI in process.

“The laser is a particularly useful if the patient has a totally occluded or heavily calcified vessel,” says Lourdes interventional cardiologist Timothy Morris, DO. “The laser vaporizes the clot rather than slicing or pushing it—which prevents any pieces of plaque from traveling downstream and clogging other vessels—effectively clearing the way for stent placement.”

The excimer laser uses ultraviolet light to destroy atherosclerotic plaque within 50 microns of the tip of the catheter. Its burst of safe, vibratory energy lasts a hundred-millionth of a second. Byproducts—water, gas and small particles (90 percent of which are smaller than a red blood cell)—are absorbed into the bloodstream.

“The laser is very good at declotting the vessel safely. It dissolves the fibrin bonds and disaggregates the platelets,” explains Dr. Morris, of South Jersey Heart Group. The excimer laser is indicated for:

- occluded saphenous vein bypass grafts;
- ostial lesions;
- long lesions greater than 20 millimeters;
- calcified stenoses and densely fibrotic plaque;
- total occlusions traversable by a guide wire;
- and lesions that fail balloon angioplasty.

Failure to open the coronary artery interventionally in these circumstances will typically dictate bypass surgery. Thus the tool can dramatically improve the course of therapy.

“This technology is especially beneficial in elderly patients with moderately calcified vessels where the balloon cannot cross the lesion and patients with significant blockages in small vessels,” Dr. Morris notes.

Other factors also make the laser particularly useful for treating acute MI:

- Compared with rotational atherectomy, the laser decreases the risk of perforation and embolization when treating highly calcific lesions in tortuous vessels.
- Reshaping the vessel lumen prior to stenting helps to improve vessel compliance and facilitate strut apposition to the vessel wall, thus helping to avoid stent underexpansion, a particular challenge when treating calcified lesions.
- The laser’s ability to ablate plaque helps to improve vessel compliance and facilitate strut apposition to the vessel wall, thus helping to avoid stent underexpansion, a particular challenge when treating calcified lesions.
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