New procedure at PVH helps save lives of cardiac patients

Hypothermia program requires lowering a patient's body temperature

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Dr. David Streeter and his team at Petaluma Valley Hospital certainly didn't make it up as they went along, but they did write it up as they were preparing to use a relatively new procedure in an attempt to save a cardiac patient's life.

The procedure is called a hypothermia program and requires lowering a patient's body temperature to the point where hypothermia is induced. It was introduced by Dr. Lance Becker, director of the Center for Resuscitation Science at Penn State University.

Faced with a life-or-death crisis, Streeter studied the procedure on the university's Web site and discovered that the University of Texas had successfully used hypothermia with equipment and capabilities similar to those at Petaluma Valley Hospital. He wrote out in long hand the protocols for the procedure at the local hospital.

"And you know how a doctor's handwriting is," kids Nancy Shaffer, a critical care nurse at PVH.

Fortunately, Streeter was the physician overseeing the procedure and was able to interpret his handwritten protocols.

The patient survived. Since then, five other cardiac patients have been treated using the hypothermia program. Of the six patients, five have recovered and suffered no neurological damage. Streeter says the one patient who failed to survive died because he did not receive CPR in time to re-start his failed heart.

Dr. Raymond Erny, head of the intensive care unit at PVH, says in some cardiac cases the new program is vital.

"It can literally be the difference between life and death," he says. "Or it can be the difference between leading a normal life and living as vegetable."

There is a substantial history of persons surviving after long periods in freezing cold water. The hypothermia program is based on lessons learned from those experiences.

In very simple lay terms, hypothermia interrupts a natural body process called apoptosis. This occurs when the body mistakes cells that have been re-oxygenated during traditional resuscitation for abnormal cells and begins destroying them. Researchers believe this is why patients, after having their heart function restored, will sometimes crash and die. Lowering the body temperature halts this cell self-destruction.

“We are beginning to better understand about brain disorders that occur post-cardiac arrest, and that’s the damage that can be prevented by cooling,” explains Erny.

Petaluma Valley Hospital is the first hospital in the county to use the procedure.

After the initial patient, Shaffer used her connections with other members of the American Association of Critical Care Nurses, Streeter’s original protocols and other information to develop PVH’s official protocol for “Hypothermia/post cardiac arrest surface cooling.”

These include sedating and paralyzing the patient with drugs so he/she doesn’t shiver, a natural body mechanism to warm itself during hypothermia.

Chilled saline is injected into the body and cold water is pumped through tubes connected to pads on the torso and legs. The body temperature is lowered to 93 degrees and kept at that temperature for 18 hours. Then it is gradually raised to the normal body temperature. The patient is closely monitored during the entire procedure.

The program has also been used once successfully for a cardiac patient at Palm Drive Hospital in Sebastopol under the supervision of Streeter.

Petaluma has progressed to the point where it has formal protocols written and awaiting approval by the appropriate hospital committees.

“We have the policies and procedures in place and a draft of the protocols. We just need the approvals,” she explained.

Erny says the protocols have already been approved by the hospital Intensive Care Unit Committee and the program is in use at Petaluma Valley.

Nancy Corda, the intensive care unit nursing supervisor, says hospital officials have been very receptive to the program.

One problem, she points out, is that the machine used to cool the patients is aging. “It has worked fine,” Corda says, “but it is older and cumbersome and they don’t make parts for it anymore.” She is in the process of searching for and pricing new equipment.”

Erny says the hospital is looking into new equipment, but the program can be provided with what is available.

“It is a simple concept,” he explains. “It is not really high-tech. It is do-able with cooling blankets and ice packs.”

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