Killing a Patient to Save His Life

By Kate Murphy

In a simulation, doctors in Pittsburgh practice a procedure that involves draining the blood and replacing it with cold salt water.

PITTSBURGH -Trauma patients arriving at an emergency room here after sustaining a gunshot or knife wound may find themselves enrolled in a startling medical experiment: **surgeons will drain their blood and replace it with freezing saltwater, without heartbeat and brain activity, the patients will be clinically dead and then the surgeons will try to save their lives.**

Researchers at the University of Pittsburgh Medical Center have begun a clinical trial that pushes the boundaries of conventional surgery and, some say, medical ethics.

By inducing hypothermia and slowing metabolism in dying patients, doctors hope to buy valuable time in which to mend the victims' wounds. But scientists have never tried anything like this in humans and the unconscious patients will not be able to consent to the procedure. Indeed, the medical center has been providing free bracelets to be worn by skittish citizens here who do not want to participate should they somehow wind up in the E.R.

"This is 'Star Wars' stuff," said Dr. Thomas M. Scalea, a trauma specialist at the University of Maryland. "If you told people we would be doing this a few years ago, they'd tell you to stop smoking whatever you're smoking, because you've clearly lost your mind."

At normal body temperature, surgeons have less than five minutes to restore blood flow before brain damage occurs. Credit University of Pittsburgh Medical Center submerged in a frozen lake or stowed away in the wheel well of a jumbo jet at 38,000 feet, people can survive for hours with little or no oxygen if their bodies are kept cold. In the 1960s, surgeons in Siberia began putting babies in snow banks before heart surgery to improve their chances of survival.

Patients are routinely cooled before surgical procedures that involve stopping the heart. But so-called therapeutic hypothermia has never been tried in patients in which a penetrative wound has already occurred, and until now doctors have never tried to replace a patient's blood entirely with cold saltwater.

In their trial, funded by the Department of Defense, doctors at the University of Pittsburgh Medical Center will be performing the procedure only on patients who arrive at the E.R. with "catastrophic penetrating trauma" and who have lost so much blood that they have gone into cardiac arrest.

At normal body temperatures, surgeons typically have less than five minutes to restore blood flow before brain damage occurs."In these situations, less than one in 10 survive," said Dr. Samuel A. Tisherman, the lead researcher of the study. "We want to give people better odds."

Dr. Tisherman and his team will insert a tube called a cannula into the patient's aorta, flushing the circulatory system with a cold saline solution until body temperature falls to 50 degrees Fahrenheit. As the patient enters a sort of suspended animation, without vital signs, the surgeons will have perhaps one hour to repair the injuries before brain damage occurs.

After the operation, the team will use a heart-lung bypass machine with a heat exchanger to return blood to the patient. The blood will warm the body gradually, which should circumvent injuries that can happen when tissue is suddenly subjected to oxygen after a period of deprivation.

If the procedure works, the patient's heart should resume beating when body temperature reaches 85 to 90 degrees. But regaining consciousness may take several hours or several days.

Dr. Tisherman and his colleagues plan to try the technique on 10 subjects, then review the data, consider changes in their approach, and enroll another 10. For every patient who has the operation, there will be a control subject for comparison.

The experiment officially began in April and the surgeons predict they will see about one qualifying patient a month. It may take a couple of years to complete the study. Citing the preliminary nature of the research, Dr. Tisherman declined to say whether he and his colleagues had already operated on a patient.

Each time they do, they will be stepping into a scientific void. Ethicists say it's reasonable to presume that most people would want to undergo the experimental procedure when the alternative is almost certain death. But no one can be sure of the outcome.

"If this works, what they've done is suspended people when they are dead and then brought them back to life," said Dr. Arthur L. Caplan, a medical ethicist at New York University. "There's a grave risk that they won't bring the person back to cognitive life but in a vegetative state."

But researchers at a number of institutions say they have perfected the technique, known as Emergency Preservation and Resuscitation, or E.P.R., in experimental surgeries on hundreds of dogs and pigs over the last decade.

As many as 90 percent of the animals have survived in recent studies, most without discernible cognitive impairment - after the procedure, the dogs and pigs remembered old tricks and were able to learn new ones.