

# Deep-chilling trauma patients to try to save them

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This undated handout photo provided by UPMC shows Dr. Samuel Tisherman, a critical care specialist at the University of Pittsburgh, who is leading a study that early next year will test whether plunging critically injured trauma victims into deep hypothermia could help save their lives. The idea: When patients are bleeding so much that the heart stops, the cold might allow them to survive without brain damage for the hour or so it takes surgeons to patch them and resuscitate them. (AP Photo/UPMC)

(AP) -- Suspended animation may not be just for sci-fi movies anymore: Trauma surgeons soon will try plunging some critically injured people into a deep chill - cooling their body temperatures as low as 50 degrees - in hopes of saving their lives.

Many [trauma patients](#) have injuries that should be fixable but they bleed to death before doctors can patch them up. The new theory: Putting them into extreme [hypothermia](#) just might allow them to survive without

[brain damage](#) for about an hour so surgeons can do their work.

In a high-stakes experiment funded by the Defense Department, the University of Pittsburgh Medical Center is preparing to test that strategy on a handful of trauma victims who are bleeding so badly from gunshots, stab wounds or similar injuries that their hearts stop beating. Today when that happens, a mere 7 percent of patients survive.

Get cold enough and "you do OK with no blood for a while," says lead researcher Dr. Samuel Tisherman, a University of Pittsburgh critical care specialist. "We think we can buy time. We think it's better than anything else we have at the moment, and could have a significant impact in saving a bunch of patients."

Tisherman calls the rescue attempt "emergency preservation and resuscitation," EPR instead of CPR. His team plans to begin testing it early next year in Pittsburgh and then expanding the study to the University of Maryland in Baltimore.

If the dramatic approach works, it will spur some rethinking about that line between life and death, says Dr. Arthur Caplan, a University of Pennsylvania bioethicist who is watching the research.

But before the first candidates get chilled, the scientists face a hurdle: The law requires that patients consent to be part of medical experiments after they're told the pros and cons. That's impossible when the person is bleeding to death. There won't even be time to seek a relative's permission.

So starting Tuesday, the Pittsburgh team is beginning a campaign required by the Food and Drug Administration to educate area residents about the study instead - with signs on city buses, video on YouTube, a web site and two town-hall meetings next month. Residents worried

about possible risks, such as brain damage, could sign a list saying they'd opt out if they ever were severely injured.

Go even a few minutes without oxygen and the brain in particular can suffer significant damage. Doctors have long sought to use hypothermia in medicine since discovering that cooling can slow the metabolism of the brain and other organs, meaning they can go without oxygen for longer periods. Donated organs are chilled to preserve them, for example. And people whose hearts are shocked back into beating after what's called cardiac arrest often are iced down to about 90 or 91 degrees, mild hypothermia that allows the brain to recover from damage that began in those moments between their collapse and revival.

But the CPR that buys time during more routine cardiac arrest doesn't help trauma patients who've already lost massive amounts of blood. Injuries are the nation's fifth-leading killer, and hemorrhage is one of the main reasons, says Dr. Hasan Alam of Massachusetts General Hospital, who is collaborating with the Pitt study.

Enter deep hypothermia, dropping body temperature to around 50 degrees. It has worked in dogs and pigs, animals considered a model for human trauma, in experiments over the past decade conducted by Tisherman, Alam and a few other research groups.

The animals were sedated and bled until their hearts stopped. Ice-cold fluids were flushed through the body's largest artery, deep-chilling first the brain and heart and then the rest of the body. After more than two hours in this limbo, they were sewn up, gradually warmed and put on a heart-lung machine to restart blood flow. Most survived what should have been a lethal injury and most appeared to be cognitively fine, Tisherman and Alam say.

Hypothermia is counterintuitive for trauma because the cold inhibits

blood clotting, something to watch while rewarming people in the planned study. Still, humans can get that cold and fare well, says Tisherman, who is co-author of a pending patent for emergency-preservation methods. He points to rare cases of people who fall through ice and instead of drowning are rewarmed and wake up, as well as deep-chilling that happens during certain heart operations that require completely stopping blood flow for a short time.

"Nothing is magical. Everything has got its limitations," cautions Alam. He says the big question is whether deep hypothermia can help in the chaos of real-life trauma when "the blood has already been lost and you're trying to do catch-up."

[Bioethicist](#) Caplan says one concern is that some people might survive but with enough brain damage that they'd have preferred death. He says the "informed community" procedure designed for studies of emergency treatments cannot adequately cover that scenario.

"Most people are going to say, 'Yes I would like you to try and save my dad,'" says Caplan, who calls emergency preservation promising. But, he says, "we continue to ignore the 900-pound gorilla of who's going to manage the bad outcome."

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