

Mayo Clinic Medical Edge

N30 How the Body Responds to Blood Loss

Intro: It's a classic scenario especially at weddings. A member of the wedding party starts to sway then, bam, they're passed out on the floor. Lots of factors contribute to this, the main one being when you stand rigidly still, blood pools in your legs away from your heart and brain so you faint. The same sort of thing happens when accident victims or wounded soldiers lose blood from internal injuries. They're fine for a while then they crash. Researchers at Mayo Clinic have teamed up with the Department of Defense to study this issue in hopes of developing monitoring devices that can help save lives.

Video

Audio

TRT 2:17 Voice of Vivien Williams	Battlefields can be difficult, confusing places. Medics make quick decisions about triaging the wounded. Some life-threatening injuries are obvious, but if a soldier is bleeding internally, there's no easy way to tell.
Michael Joyner, M.D. Mayo Clinic Anesthesia Research	"There's kind of a gradual response where your body compensates followed by a sudden decompensation."
Voice of Vivien Williams	Dr. Michael Joyner and his research team at Mayo Clinic are studying how the body responds to blood loss.
Michael Joyner, M.D.	"The purpose of this experiment is to help the army develop better monitors to determine who needs a transfusion and who doesn't need a transfusion in battlefield trauma situations."
Voice of Vivien Williams	Triaging the wounded can be difficult, because when someone loses blood, vital signs such as blood pressure and heart rate don't change much until the victim suddenly collapses.
Michael Joyner, M.D.	"What we're trying to do is predict when the vital signs become unstable."
Voice of Vivien Williams	So they can intervene in time and save lives.

Voice of Vivien Williams	The study, funded by the Department of Defense, includes two phases. First the research team slowly and in a very controlled manner, removes blood from a test subject.
Michael Joyner, M.D.	"We're going to take about a liter of blood off."
Voice of Vivien Williams	That's about 20-percent of total blood volume
Michael Joyner, M.D.	"And that's typically when people begin to decompensate."
Voice of Vivien Williams	Then they put the blood back in and start phase two of the experiment. This involves putting the test subject into a negative pressure box. The negative pressure makes it difficult for blood to flow back to the heart so it pools in the legs. The amount of blood that reaches the brain and heart decreases, mimicking blood loss. The researchers say if the body responds to the negative pressure the same way it responds to actual blood loss, they can do more experiments without having to take blood from patients' bodies. The information they gather will be used to develop monitoring devices that will hopefully help determine who needs immediate medical attention on and off of the battlefield.
Michael Joyner, M.D.	so that when we're working with trauma victims or people in the operating room we can figure out who needs blood when. And the goal is to make sure the patients do well during surgery and to make sure that we give blood to the right patient."
	For the Mayo Clinic News Network, I'm Vivien Williams

Anchor tag:

Some of the monitoring devices being developed for use on the battlefield include equipment for medical professionals as well as monitors soldiers carry or wear.

Dr. Joyner and his team have several studies underway looking at blood loss and how the body responds to extreme environments.

Dr. Joyner's study is an integral part of the Tactical Combat Casualty Care Research Task Area managed by Dr. Vic Convertino at the US Army Institute of Surgical Research. Their mission is to optimize combat casualty care in the pre-hospital setting.

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