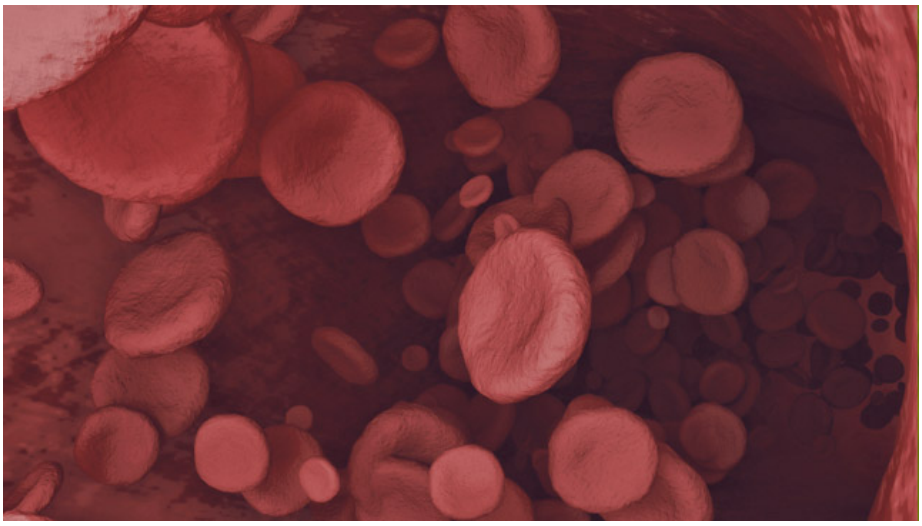
HealthlineNews

New Type of Shot Might Be Able to Stop Internal Bleeding

Written by Chuck Green | Published on October 2, 2015

Researchers say a new mix of particles shows promise in producing blood clots that would halt internal bleeding.



The number of bleeding-related deaths is enormous, says Christian Kastrup.

Kastrup and his colleagues want to do something about it.

Current treatments don't often work, due to their inability to penetrate deep wounds and stanch the bleeding from damaged blood vessels.

That happens because the rapid flow of blood pushes most drugs out of the wound, explained Kastrup, Ph.D. and assistant professor at Michael Smith Laboratories and the department of biochemistry and molecular biology at the University of British Columbia in Canada.

Kastrup and his team conducted experiments to see if self-propelled particles could overcome this flow.

They found a combination of reagents, a calcium carbonate and an organic acid that resembles fizzing antacid tablets, that could both move through flowing blood and deliver cargo.

In this case, the package was thrombin and tranexamic acid, drugs that help blood clots form — the type that can coagulate blood deep in wounds.

These compounds could be delivered in something as easy as a shot.

Read More: The Facts on Bleeding Into the Skin »

A Different Kind of Particle

Many types of self-propelling particles have been previously developed, but they usually don't react by simply being put into blood.

The particles, loaded with the coagulant enzyme thrombin, were placed onto bleeding wounds by Kastrup's team.

The particles worked, Kastrup told Healthline, by transporting the coagulant throughout the wound and into the nearby blood vessels, clotting the blood at the damaged vasculature.

However, Dr. Marc Leavey is somewhat dubious.

"I'm having trouble envisioning the mechanism described. How do the particles direct the CO_2 in the right direction to move directly to the site in question, navigate branching vessels, [and] avoid being engulfed by macrophages?" Leavey, an internist at Mercy Medical Center in Maryland, told Healthline.

Macrophages engulf and digest debris such as dead cells and foreign particles.

"We're continuing to evaluate the risk of particles leading to unwanted blood clotting, but haven't observed this so far," answered Kastrup.

Read More: Is da Vinci Robotic Surgery a Revolution or a Rip-off? »

Is This Really Science Fiction?

Whatever the case, Leavey said the concept reminds him of the "nanoparticles"

that were part of the “Star Trek” universe.

“Those little devices could carry medications or effect repair, deep within the body,” said Leavey. “Thirty or 40 years ago, many of the medications and interventional techniques we routinely use today would have seemed to be science fiction."

From imaging techniques to laparoscopic surgery to genetic therapy, these common procedures were not believable then.

> *Thirty or 40 years ago, many of the medications and interventional techniques we routinely use today would have seemed to be science fiction.*
>
> Dr. Marc Leavey, Mercy Medical Center

“To suspend my disbelief now, and suppose that these particles could work as described, their possibilities only add to the excitement of medicine in the 21st century,” Leavey continued.

There have been other gas-powered medication delivery systems — some patented years ago — “so the basic concept proposed in this release may have some history,” he noted.

Read More: Bariatric Surgery Patients Eventually See Weight Gain »

Is the Treatment Near?

Kastrup said due to the simplicity of the components in the particles, he and his colleagues believe they can be developed further and used by humans within two to three years.

The team has a bit of a head start in that the components of the particles have been used in therapies. That makes it easier to translate these findings toward application in the clinic, Kastrup said.

A two- to three-year implementation horizon sounds a bit ambitious to Leavey.

“(Given) my ignorance of the precise mechanism, anticipated testing, and evaluation, not to mention regulatory considerations, should this product gain approval and acceptance, potential applications may, indeed, be far-reaching,” he said.

“Again, allowing my mind to wander, stopping bleeding on the battlefield or [at a] street corner accident would be a huge advance,” Leavey added. “But beyond that, if these particles could, in fact, carry some active moiety or part of a molecule, one could conceive of chemotherapy, antibiotics, or other locally active medications being sent directly to the site of action. If it can be done in three years or 30 years, it would be a significant advance in medical care."

Patients that could benefit most are ones with severe bleeding.

That would include people experiencing severe bleeding following childbirth, sinus bleeding, GI bleeds, or traumatic wounds untreatable with manual compression, noted Kastrup.

> *The particles themselves can do much of the work by transporting through the blood and wound and reaching the source of blood loss.*
>
> Christian Kastrup, University of British Columbia

"In these cases, the particles themselves can do much of the work by transporting through the blood and wound and reaching the source of blood loss," he said.

Added Leavey: "The question is understanding the proposed mechanism and purpose. Does it have a future? I have to wait and see with cautious curiosity."

Tell us what you think Add a Comment

You May Like

Scientists Pinpoint Physical Cause of Fibromyalgia Pain

Add a comment ▼

0 Comments Sort by Oldest

Add a comment...

Facebook Comments Plugin

Healthline's mission is to make the people of the world healthier through the power of information. We do this by creating *quality* health information that is authoritative, approachable, and actionable.

Join more than **50 million** monthly visitors like you and let Healthline be your guide to better health.

Site Map
Health Topics
Health News
Diabetes Mine

About Healthline
Our Staff
About Healthline.com
Advertising & Sponsorship Policy
About Healthline Corp

Get in Touch
Contact
Careers
Advertise With Us
Newsletter Sign-Up

This website is certified by Health On The Net.
Click here to verify

Sign Up for **Health Tips**

Get the latest health & wellness advice delivered straight to your inbox, and check out our other newsletters.

Enter your email address

Sign Up

Your privacy is important to us

Find us on: