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Young Jae Chun, PhD **Bryan Tillman, MD, PhD**

RESCUE Stent

Value Proposition

The RESCUE Stent is a novel fully retrievable stent with a radiofrequency (RF) positioning system for rapid control of traumatic hemorrhage in non-compressible regions, such as the chest and abdomen. The embedded RF technology & novel design contribute to easier and rapid placement by the clinicians and permit the blood flow to abdominal organs simultaneous with hemorrhage control.

The Rescue stent may allow hospitals to improve patient outcomes while reducing the enormous healthcare expenses and mortality that accompany patients with major vascular trauma.

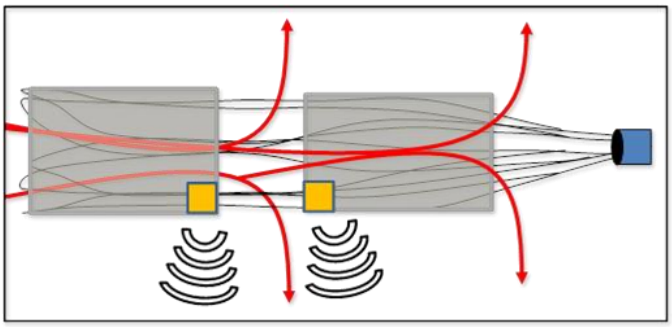
Market Opportunity

- Greater than 440,000 injuries worldwide
- 42,000 Non-Compressible Torso Injuries (NCTI) of the vessel in the U.S. (est.)
- Mortality > 80% from rapid blood loss.

The RESCUE stent aims to decrease the 80% mortality rate of patients arriving in hospitals with traumatic non-compressible injuries. Payment of hospital care costs are based on successful outcomes (i.e. reduced ICU time and increased survival rate). Treatment delays and care costs can exceed $250,000/ patient. Therefore, by rescuing even 20% of patients, hospitals can save ~$1B.

Competitive Landscape

The limitation of the currently available Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) is that there is no perfusion of blood to the organs, increasing the probability of organ failure and death post-treatment. By contrast, the RESCUE both stops hemorrhage rapidly and allows for continual blood perfusion, increasing the chances of patient survival.



Technology

The RESCUE stent will be collapsed into a catheter and delivered into the desired injury location from a needlestick access in the groin. The device location will be monitored with the RF positioning system. After deployment in the vessels, the dual section design ePTFE membrane will cover both the chest and abdominal injuries while the open middle section maintains blood perfusion to the abdominal organs.

RESCUE stent's novel "petal and stem" design and its use of FDA approved material and RF technology result in a value add to the surgeons.

Stage of Development

In vitro simulated hemorrhage control models and ***in vivo*** small-scale porcine model of penetrating vascular trauma in the torso have been completed. The RESCUE stent is undergoing final design modifications in preparation for larger-scale in vivo porcine models as well as a heart-beating cadaver study.

IP Portfolio

Non-provisional Patent Application (2016/0157868):

- Perfusion Device for Treating an Injured Blood Vessel

Funding

Supported by UPMC Department of Surgery and Division of Vascular Surgery, DOD and Coulter TP II.

FEATURED INVENTORS:

Bryan Tillman, MD, PhD

Brief Bio

Dr. Bryan W. Tillman is board certified in both general and vascular surgery. He is a past recipient of the Wylie Scholar Award and the American Surgical Association Award. He supervises a Department of Defense funded research program developing a novel removable stent for the treatment of life threatening bleeding. His laboratory has also pioneered a stent to improve recovery of donor organs for transplant.

Education

MD & PhD, University of Alabama at Birmingham

Young Jae Chun, PhD

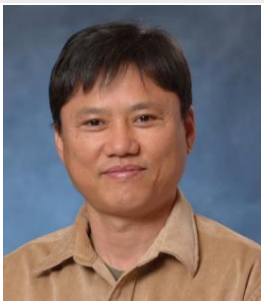
Brief Bio

Dr. Chun's primary research interests include designing/manufacturing the smart metallic structure, investigating biocompatibility, analyzing the mechanical and physical behaviors. In this current research, he combines knowledge from diverse fields such as material processing, MEMS/Nano fabrication, surface engineering that is critical to fulfill the goal of interdisciplinary projects of metallic biomaterial-based medical devices for vascular repair.

Education

MS & PhD, Mechanical Engineering, University of California, Los Angeles, USA

Sung Kwon Cho, PhD



Brief Bio

His primary research focus is on "microfluidics," with particular emphasis on the development of a variety of micro/bio fluidic transducers and integrated systems that enable us to efficiently handle a wide range of micro/bio substances.

Education

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