

Injectable Sponge Device to Seal Bullet Wounds

Posted in [Medical Materials - Form Supplied](#) by Thomas Klein on February 14, 2014



Gunshot wounds—whether on the battlefield or in the neighbourhood—are immediate life-limiting injuries if not treated. Therefore, it's imperative that when a gunshot injury occurs, the wound is treated as soon as possible to stem the blood flow.

Although there are antihaemorrhagic powders available on the market such as [Celox](#), these treatments require external application of pressure, which takes up manpower and time. Researchers based at [RevMedx](#), a U.S.-based development company, have designed and developed a new device that facilitates the injection of an anti-haemorrhagic directly into the wound, resulting in pressure being applied from the inside of the wound, estimating to stem blood flow within just 15 seconds.

The dressing works via the use of a lightweight injector device, of which there are two under development. The injector facilitates the deposition of high numbers of expanding medical sponges, which are coated with a haemostatic agent. When in-situ, the sponges rapidly expand, increasing their surface area and assisting in inhibition of bleed, while at the same time exerting pressure. As a result, there is no need for external compression. Recent trials have indicated strong efficacy in haemostasis and survival rates. It is suggested that it has proved especially useful for areas where tourniquets are difficult to apply, such as the pelvis or shoulder.

While developing this innovative delivery mechanism to enhance treatment, the designers have also embraced the issues associated with the environments that this type of device are likely to be used in. Considering battlefield storage issues and portability, they seem to have taken on board the fact that this will have a definite impact on usability. Both small and large devices consist of an applicator and plunger mechanism, but the larger bore device can be stored with the plunger in a shortened state while being fully charged to minimize packaging size. The smaller-bore device uses the plunger as a storage facility for multiple devices providing a low-profile package but maximising availability. The simple design mechanism means that in stressful and often confusing

environments, minimal step preparation will potentially impact on mortality outcomes of wounded military personnel.

Although the developers have worked closely with the U.S. military through the design process, they also see potential opportunities for the use of the device in emergency medicine based in the civilian world with the increased incidence of gunshot wounds on the street. No other devices currently exist on the market that are able to treat bullet wounds in this type of manner.

By Adele Graham-King

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Fonte: emdt - European medical device technology