

A Review Article for Pre-Medical Management of Gunshot

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ABSTRACT:

In battle the majority of the casualties are because of the ten minutes of trauma. Most injuries result from an explosion and hemorrhage (over/excessive bleeding) plays a central role. To improve survival rates, my idea is to develop equipment based on pre-hospital combat casualty care, forward medical support during the first hand and damage control surgery.

Method: This review is based on the patient publication retrieved by a selective search in medicine and on the author's clinical experiment.

Model: My model is based on the gunshot to stop (or) obstruct hemorrhage based on medical equipment which consists of a expandable sponge

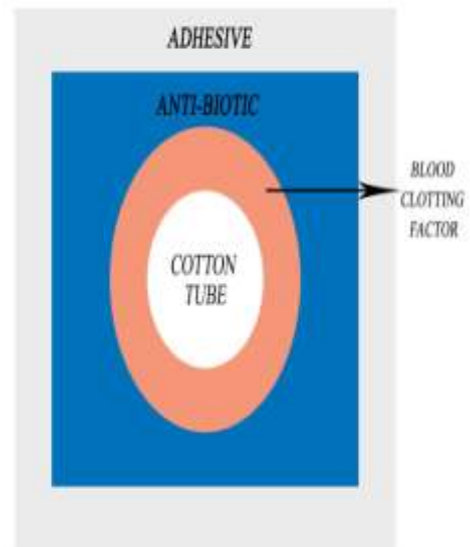


Fig: Posterior structure and contents of the bandage

(Includes antibiotics, painkiller) and seems like a bandage strip with a cap over it anterior position.



Fig: Anterior structure of the bandage

RESULT:

By sticking this stripped band at the site of gunshot it can control hemorrhage By the expandable sponge (which have capacity to stop bleeding) easily attachable to the human body, as it also consist pain killer.

CONCLUSION:

A comprehensive approach to injury to gunshot as it is a primary prevention. But it also injures mitigation and consequence management.

Usage:

By opening the pack we have to insert the sponge into the hole of gunshot band it starts stopping hemorrhage after that we can easily remove it by using the Anterior cap.

Mechanism:

It is expandable sponge cotton made up of little amounts of cellular, antibiotics and painkiller. By attaching to blood (as it is a liquid) it starts expanding.

- 1) Cellulose will allow easy penetration into the hole.
- 2) Antibiotics may help to protect from micro-organisms.
- 3) Pain Killer will help to decrease small amount of pain.

It is just a primary medication to a soldier when they experience a gunshot to recover in a little span of time (10 min).

Suggestion Based:

It was based on the idea of JIM McKay, March 22, 2018.



- Between 30 and 40 percent of civilian deaths by traumatic injury are the result of hemorrhaging, according to the United States Army Institute of Surgical Research. Between 33 and 56 percent occur before the victim reaches the hospital.
- That can change if first responders have XSTAT, a new treatment that stops bleeding within a minute of opening its package. It's a syringe with tiny sponges that are pumped into the wound and expand, creating pressure that stops the bleeding.
- It was designed for the military, which found that 20 percent of combat deaths could have been prevented with such a solution.
- The main use for XSTAT is for penetrating wounds, such as gunshot wounds, knife wounds, injuries from projectiles that are on a part of the body where it's difficult to apply a tourniquet. The standard remedy, to this point, for such wounds is packing the wound and absent XSTAT, that means stuffing it with hemostatic dressing or gauze.



“Picture the size of a 9-mm gunshot wound,” said Will Fox, vice president of sales and marketing for RevMedx, which makes XSTAT. “Imagine sticking your finger in that hole about 30 times with gauze.”

- The sponges are made of cellulose, made from wood pulp and covered in a substance called chitosan, which is an antimicrobial compound that fights off bacteria and causes blood clotting. Combined with the expansion of the sponge itself and bleeding usually stops within a minute. Using gauze or dressing can take four, five, six minutes or more, which could be too late.
- Dr. Kenji Inaba is a trauma surgeon at Los Angeles County General Hospital and also a sworn reserve police officer in the Rampart Division of the Los Angeles Police Department, and he's used XSTAT 14 times, each time saving the patient.
- Using XSTAT is always a prelude to surgery where vessels have to be repaired and when using this technology, the sponges have to be removed. The sponges are each equipped with markers that can be seen with an X-ray.
- Fox said that about 15 entities, including the Highland Park, Texas, Department of Public Safety, have either adopted XSTAT or are testing it.

“Over the last nine months, we've been focusing on prehospital — EMS services, fire, trauma hospitals, places where you see a need for this such as for gunshot victims,” Fox said. “Some just want to be prepared for a natural disaster or mass casualty or active shooter incident.”

XSTAT can also be used in place of a tourniquet on some injuries. “We just received expanded clearance from the FDA to include extremity injuries,” Fox said. “Sometimes you

have severe injuries to arms or legs where a tourniquet isn't affective, or severe arterial bleeding, and that's what XSTAT is designed to treat."

The cost of an XSTAT is about \$80, more expensive than gauze or a tourniquet, which costs around \$27. Fox said RevMedx is working on getting the price down but pointed out that while one unit of XSTAT is more expensive than a tourniquet or gauze, the results are worth it.

"To pack a wound with gauze, you would need two or three rolls, which would be the same cost," he said. "And tourniquets aren't reusable either; you have somebody bleeding all over the place, you're not going to reuse a tourniquet."

* Demerits:

Demerits in his equipment are usage of number of spongy balls and after the pre-medication; it becomes difficult to remove sponges from the wound.

*Comparison:

From my idea I'm using single but large spongy cotton and also an anterior cap for what the sponge is attached after he pre medication he sponge is easily taken out from the gunshot wound.

My design comes in different sizes as it depends on the size & depth of bullet wound pocked into the body in gunshot.

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REFERENCE:

- [1]. FastStats, 2016. Centers for Disease Control and Prevention/National Center for Health Statistics Web Site. [Accessed May 22, 2018]. Available at:<http://www.cdc.gov/nchs/fastats/homicide.htm>. Updated February 6, 2016.
- [2]. Malina D, Morrissey S, Campion EW, et al. Rooting out gun violence. *N Engl J Med*. 2016;374:175–6. [PubMed] [Google Scholar]

- [3]. Kassirer JP. Guns, society, and medicine. *N Engl J Med*. 2015;373:874–5. [PubMed] [Google Scholar]
- [4]. Butts JA, Roman CG, Bostwick L, et al. Cure violence: a public health model to reduce gun violence. *Annu Rev Public Health*. 2015;36:39–53. [PubMed] [Google Scholar]
- [5]. Cassel CK, Nelson EA, Smith TW, et al. Internists' and surgeons' attitudes toward guns and firearm injury prevention. *Ann Intern Med*. 1998;128(3):224–30. [PubMed] [Google Scholar]
- [6]. Frattaroli S, Webster DW, Wintemute GJ. Implementing a public health approach to gun violence prevention: the importance of physician engagement. *Ann Intern Med*. 2013;158(9):697–8. [PubMed] [Google Scholar]
- [7]. American College of Physicians. Firearm injury prevention. *Ann Intern Med*. 1998;128(3):236–41. [PubMed] [Google Scholar]
- [8]. Bauchner H, Rivara FP, Bonow RO, et al. Death by gun violence—a public health crisis. *JAMA*. 2017;318(18):1763–4. [PubMed] [Google Scholar]
- [9]. Laine C, Taichman DB. The health care professional's pledge: protecting our patients from firearm injury. *Ann Intern Med*. 2017;167(12):892–3. [PubMed] [Google Scholar]
- [10]. Fenelon A, Chen LH, Baker SP. Major causes of injury, death and the life expectancy gap between the United States and other high-income countries. *JAMA*. 2016;315(6):609–11. [PMC free article] [PubMed] [Google Scholar]
- [11]. Rodriguez MA, Gorovitz E. The politics and prevention of gun violence. *West J Med*. 1999;171(5–6):296–7. [PMC free article] [PubMed] [Google Scholar]
- [12]. Davidoff F. Reframing gun violence. *Ann Intern Med*. 1998;128(3):234–5. [PubMed] [Google Scholar]
- [13]. Wintemute G. What you can do to stop firearm violence. *Ann Intern Med*. 2017;167(12):886–7. [PubMed] [Google Scholar]
- [14]. Weinberger SE, Hoyt DB, Lawrence HC, III, et al. Firearm-related injury and death in the United States: A call to action from 8 health professional organizations and the

- American Bar Association. *Ann Intern Med.* 2015;162(7):513–7. [[PubMed](#)] [[Google Scholar](#)]
- [15]. Wintemute GJ. Disproportionate sales of crime guns among licensed handgun retailers in the United States: a case-control study. *Injury Prev.* 2009;15(5):291–9. [[PubMed](#)] [[Google Scholar](#)]
- [16]. McNeil DG, Jr, Romero S, Tavernise S. How a medical mystery in Brazil led doctors to Zika. *New York Times.* 2016 Feb 7; [[Google Scholar](#)]
- [17]. Kumar V, Abbas AK, Aster JC. *Robbins and Cotran Pathologic Basis of Disease.* 9th ed. Philadelphia (PA): Elsevier Saunders; 2015. [[Google Scholar](#)]
- [18]. Angus DC, van der Poll T. Severe sepsis and septic shock. *N Engl J Med.* 2013;369(9):840–51. [[PubMed](#)] [[Google Scholar](#)]
- [19]. DiMaio VJM. *Gunshot Wounds: Practical Aspects of firearms, Ballistics, and Forensic Techniques.* 3rd ed. Boca Raton (FL): CRC Press; 2015. [[Google Scholar](#)]
- [20]. Yoganandan N, Pintar FA, Kumaresan S, et al. Dynamic analysis of Penetrating trauma. *J Trauma.* 1997;42(2):266–72. [[PubMed](#)] [[Google Scholar](#)]
- [21]. Yoganandan N, Nahum A, Melvin J. *Accidental Injury: Biomechanics and Prevention.* 3rd ed. Springer; Nov, 2014. [[Google Scholar](#)]
- [22]. Mc Inerney SJ. Introducing the biopsychosocial model for good medicine and good doctors. *BMJ.* 2015;324:1533. [[Google Scholar](#)]
- [23]. deRoos-Cassini TA, Mancini AD, Rusch MD, et al. Psychopathology and resilience following traumatic injury: a latent growth mixture model analysis. *Rehabil Psychol.* 2010;55(1):1–11. [[PubMed](#)] [[Google Scholar](#)]
- [24]. Rowhani-Rahbar A, Zatzick D, Wang J, et al. Firearm-related hospitalization and risk for subsequent violent injury, death, or crime perpetration: a cohort study. *Ann Intern Med.* 2015;162(7):492–500. [[PubMed](#)] [[Google Scholar](#)]
- [25]. Hunt JC, Chesney SA, Brasel K, et al. Six-Month follow up of the injured trauma survivor screen: clinical implications and future directions. *J Trauma Acute Care Surg.* 2018;85(2):263–70. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
- [26]. Machtinger E, Cuca Y, Khanna N, et al. From treatment to healing: the promise of trauma-informed primary care. *Women's Health Issues.* 2015;25(3):193–7. [[PubMed](#)] [[Google Scholar](#)]
- [27]. Centers for Disease Control and Prevention. Ten Great Public Health Achievements--United States, 2001–2010. 2011;60(19):619–23. [[Google Scholar](#)]
- [28]. Rubin R. Tale of 2 Agencies: CDC avoids gun violence research but NIH funds it. *JAMA.* 2016;315(16):1689. [[PubMed](#)] [[Google Scholar](#)]
- [29]. Mozaffarian D, Hemenway D, Ludwig DS. Curbing Gun Violence: Lessons from Public Health Successes. *JAMA.* 2013;309(6):551–2. [[PubMed](#)] [[Google Scholar](#)]
- [30]. Farley T. *Saving Gotham: A Billionaire Mayor, Activist Doctors, and the Fight for Eight Million Lives.* New York, NY: WW Norton & Company, Inc; 2015. [[Google Scholar](#)]
- [31]. Ranney M, Fletcher J, Alter G, et al. A consensus-driven agenda for emergency medicine firearm injury prevention research. *Ann Emerg Med.* 2017;69(2):227–240. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
- [32]. Rodgers GB. The safety effects of child-resistant packaging for oral prescription drugs – two decades of experience. *JAMA.* 1996;275(21):1661–5. [[PubMed](#)] [[Google Scholar](#)]
- [33]. Vernick JS, Meisel ZF, Teret SP, et al. “I didn’t know the gun was loaded”: an examination of two safety devices that can reduce the risk of unintentional firearm injuries. *J Public Health Policy.* 1999;20(4):427–40. [[PubMed](#)] [[Google Scholar](#)]
- [34]. Teret SP, Defrancesco S, Hargarten SW, et al. Making guns safer. *Sci Technol.* 1998;14(4):37–40. [[Google Scholar](#)]