

Why Does This Problem Need to be Solved?

- The application of a tourniquet often results in limb amputation due to severe nerve damage. As pressure increases, so does risk of tourniquet related injuries.
- While pneumatic tourniquets solves the issue of finding the optimum pressure, concerns about size and weight have kept surgical pneumatic tourniquets off the battlefield.
- Pneumatic tourniquets issued to medics are too complicated for regular infantry to use effectively.

The Team:

Riley Furlong
Santa Monica High School
2271 26th St.
rileyfurlong@sbcglobal.net

Shrayes Raman
Santa Monica High School
1153 Berkeley St.
shrayesraman@gmail.com

Ben Karni
Santa Monica High School
2414 Hill St.
bkarni3@gmail.com

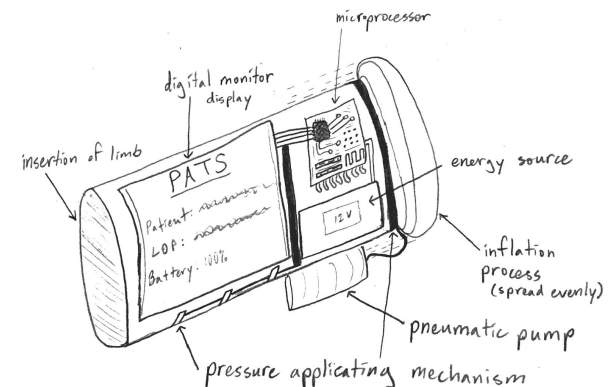
Portable Automatic Tourniquet System (PATS)

Citations

"Battlefield Medicine Saves Lives Outside War Zones." *BORGEN Magazine*, Portland, Oregon, 4 Nov. 2015, www.borgenmagazine.com/battlefield-medicine/.

"Emergency and Military Tourniquet (EMT)." *CTOMS*, CTOMS Inc., 2019, [ctoms.ca/Mission-Essential-Equipment/Hemorrhage Control/Emergency-and-Military-Tourniquet-EMT_2.ht](http://ctoms.ca/Mission-Essential-Equipment/Hemorrhage-Control/Emergency-and-Military-Tourniquet-EMT_2.ht)

"SOFTT-W Tourniquet." *Rescue Essentials Tactical Emergency Medical Supplies*, 2019, www.rescue-essentials.com/softt-w-tourniquet-black/.



The Problem:

On current battlefield conflicts such as in Iraq and Afghanistan, thousands of infantrymen are equipped with simple tourniquets that often result in traumatic limb amputations. More advanced tourniquets are either too bulky or complex to be used by regular infantry.



Infantrymen are issued standard tourniquets, which can often induce limb amputations.



The pneumatic tourniquet offers a solution to battlefield hemorrhaging and severe nerve damage. However, they are considerably difficult to use effectively for infantry use, especially in high pressure situations, meaning they limited to use by field medics.



Statistics

The US Military makes use of Tourniquets in combat situations for dealing with external trauma. Of 4,297 casualties with extremity trauma in the total study, 30% (1,272/4,297) had tourniquet use. "Survival rates increased for casualties with injuries amenable to tourniquets..." The current standard issue tourniquet is the CAT which has a 79% effective rate of stopping blood flow. In addition, according to a recent study, of 499 patients reviewed from a military combat hospital in Iraq, 13 people had injuries related to improper tourniquet use.