



Introducing the **SAVE TOURNIQUET®**

Engineered to attain femoral artery occlusion in 2.1 seconds

The goal was to engineer a tourniquet that was immediately intuitive; to provide speed, targeted compression and could be applied with gross motor skills that are already ingrained into procedural memory (such as push, turn and pull maneuvers). In other words;

Speed, Control & Targeted Compression – Without Complexity

Patent # 12345678910

The **SAVE Tourniquet®** is elegantly simple, consisting of a ballistic nylon strap, a refined buckle similar to a car seat buckle, a pressure ridge that targets and speeds up compression, and a reel that can single handedly **occlude blood flow in 3 turns or less!**



Traumatic Hemorrhage Timeline: The 90 second window:

A Class 3 Hemorrhage results in .2 liters of blood loss every 10 seconds. At 90 seconds the patient will lose fine motor control and ability to make rational decisions.

(Advanced Trauma Life Support by the American College of Surgeons)



Tourniquet Design Objectives

A traumatic Class 3 Hemorrhage stemming from an accident, combat or act of terrorism is not just an injury that lacerates an artery. It will also trigger an initial psychological shock that takes time from which to recover.

Time and a Class 3 Hemorrhages are not compatible; victims are losing blood at a rate of .2 liters (2000 cc's) every 10 seconds. At this pace, a self-treating victim has a 90 second window to recover from the initial psychological shock of the injury, assess the severity of the injury and apply a tourniquet before blood loss inhibits all cognitive and motor skill functions. EMS personnel will have even less time to apply a tourniquet. With 90 seconds as the design variable, modern day tourniquets need to focus on *speed of application, simplicity of application and the ability to target the compression.*

The patented **SAVE Tourniquet®** is a product of four years of human factor research, along with the expertise of a trauma surgeon and sports medicine internist. The goal was to engineer a tourniquet that was immediately intuitive, could provide speed, targeted compression and could be applied with gross motor skills that are already ingrained into procedural memory (such as push, turn and pull maneuvers). In other words:

Speed, Control & Targeted Compression – without Complexity.

The **SAVE Tourniquet®** is elegantly simple, consisting of a ballistic nylon strap, a refined buckle based upon the car seat buckle, a pressure that targets and speeds up compression, and a reel that can single-handedly occlude blood flow in 3 turns or less.

Simplicity

The enemy of a Class 3 hemorrhage is time, and *complexity* adds *time*. The **SAVE Tourniquet®** was engineered by using human factor design principles, beginning with the need to reduce “workload”.

Workload is measured in a multitude of variables, but the most common includes the amount of cognitive oversight a skill needs to be completed, and the number of steps (micro-skills). Workload is also measured by the nature of the motor skills (gross, fine, complex, tracking) needed to accomplish the task.

The **SAVE Tourniquet®** was engineered to be *simple*, as the application is a combination of gross motor skills. In this case, the **SAVE Tourniquet®** is applied accordingly;

- Push the buckle until snapped in place
- Pull any slack out of the strap
- Push down reel into a pre-locked position
- Turn the reel (most commonly 3 times) to the right, or until bleeding stops
- Pull up on the reel to release or reset tension

Each **SAVE Tourniquet®** package features one tourniquet for the arm and one for the leg. The purpose; save the patient or EMS professional the *time* needed to adjust the strap length.

SAVE Tourniquets® can be acquired separately for the purposes of inventory management.

Speed in Application

Speed in applying a tourniquet is a product of reasoned and engineered design principles. These principles not only include the use of enhanced technology, but also selecting technology that is used daily as part of our culture. Adoption of this design model taps into *procedural memory*, the part of the brain that does not require conscious brain oversight.

Targeted Compression

For these reasons the **SAVE Tourniquet®** introduces the pressure ridge, a key feature that targets the compression on the vascular bodies, which simultaneously speeds occlusion. The pressure ridge also keeps the tourniquet from sliding along an affected limb.

Simple Buckle Snap

The buckle snap allows the patient or an EMS professional the ability to wrap the strap around the leg or arm, snap the buckle lock and pull the strap tight as one does on an airplane seat. This design all but eliminates the need to weave or lace a strap through the intricacies of a buckle.

Compression Reel

The compression reel was selected to tighten the **SAVE Tourniquet®** in 3 turns or less – taking less than 3 seconds. The compression reel is applied single handedly and can be released without the fear of “unwinding”. When time to release, simply pull up on the reel to release the locking mechanism.

The Save Tourniquet® is a patented product and is protected under the U.S. Patent Law.

Patent Number: USD67909S

Using the table as developed by the American College of Surgeons, the blood loss between the **SAVE Tourniquet®** and a windlass tourniquet can be over 2 liters.

The **SAVE Tourniquet®** vs Windlass

In 2012, Dr. James Wade (M.D., trauma surgeon) was asked to conduct a Doppler Sound examination comparing the new **SAVE Tourniquet®** against the traditional windlass tourniquet. The windlass tourniquet is based upon a stick and rope technique originally designed by the Romans.

In his demonstration, Dr. Wade was able to attain complete femoral artery occlusion in 2.1 seconds with the **SAVE Tourniquet®**. (after strap securement)

In contrast, it took Dr. Wade *25 seconds* to attain complete femoral artery occlusion with the traditional windless tourniquet (after strap securement)

See video at:
www.savetourniquet.com

According the textbook, *Advanced Trauma Life Support* as published by the American College of Surgeons, the human body holds 5-6 liters of blood. The textbook also notes the human body at rest (as defined by a heart rate of 60 beats per minute), moves about .1 liter (1000 cc's of blood every 10 seconds).

At. 2.1 seconds to attain femoral artery occlusion, the **SAVE Tourniquet®** requires 1/10th the time to apply under the stress of patient care. More importantly, the blood loss associated with the **SAVE Tourniquet®** is 210 cc's compared to 2500 cc's of blood loss by the windless tourniquet.



Secure the strap



Tighten the compression reel



Blood flow is completely occluded

As quoted by renowned inventor Leonardo DaVinci,
 “Simplicity is the ultimate sophistication.”

Also see
 Stress Paradox,
 Understanding How
 the Body’s Innate
 Programming Can
 Inhibit The
 Performance of First
 Responders.

2008. Siddle, B.K.
 Journal for Emergency
 Medicine

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1. According to the *Advanced Trauma Life Support* (as published by the *American College of Surgeons*), a patient experiencing a Class 3 Hemorrhage injury will sustain a pulse rate exceeding 120 BPM. Under these conditions, the patient will be losing approximately 1.2 liter of blood per minute – or – .2 liters every 10 seconds. Hemorrhaging at this pace will result in:
 - Class 2 Shock occurs after 40 seconds of blood loss.
 - Class 3 shock occurs after 80 seconds of blood loss.
 - After 90 seconds of a Class 3 Hemorrhage, the patient will begin to lose fine motor control and the ability to process complex decisions.

2. Any tourniquet that is applied longer than 4 hours may result in tissue damage.
3. The SAVE Tourniquet® *is a patented product and is protected under States Patent Law. Patent Number: USD67909S*

Each **SAVE Tourniquet®** package features one tourniquet for the arm and one for the leg. The purpose; save the patient or an EMS professional the *time* needed to adjust the strap length.

Each tourniquet package is clearly marked with an arm or leg symbol to reduce decision time. However, each **SAVE Tourniquet®** can be acquired separately for the purposes of inventory management.



ARM



LEG



The SAVE Tourniquet® is a joint venture by
Saracen Solutions, LLC,
Human Factor Research Group
Detonics Technologies

For SAVE Tourniquet® pricing and to place an order
please call 618-476-3200