

BLEEDING CONTROL (BCON) "STOP THE BLEED"

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HARTFORD CONSENSUS

2012 panel with representatives from

- □ White House
- □ DHS
- □ FBI
- DoD

ACS certified surgeons from U.S. trauma centers
EMS
Nursing

"STOP THE BLEED" CAMPAIGN

- The purpose of the campaign is to build national resilience
 - by raising awareness of <u>basic actions</u> to stop life threatening bleeding following everyday emergencies and man-made and natural disasters



"No one should die from uncontrolled bleeding"

MORE THAN 1 MASS SHOOTING PER MONTH IN THE U.S. IN 2018 (JAN 1 – NOV 28)

FBI Definition of Mass Shooting: Four or more killed, not including the shooter.

MANY OTHER SOURCES OF INJURY WITH POTENTIAL FOR RAPID BLOOD LOSS FROM WOUNDS











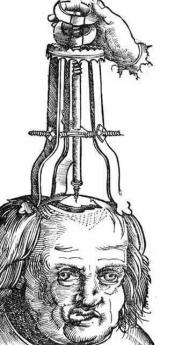
2018 STUDY FROM UT AUSTIN 1st ACTUAL PROOF OF SURVIVAL BENEFIT

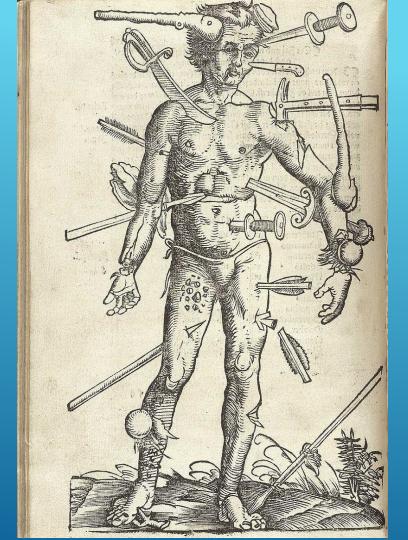
- 1,026 patients with severely bleeding wounds; 181 had pre-hospital tourniquets applied
 - > Those with tourniquets had a 6-times less chance of dying
- "Tourniquets are still underused"
- More aggressive prehospital application of extremity tourniquets in civilian trauma patients with extremity hemorrhage and traumatic amputation is warranted."

BLEEDING CONTROL HISTORICAL PERSPECTIVES

1517 > Hans von Gersdoff > 1st description of tourniquet use during amputations

C Das ift da ans ber instrument / väi das dyenet mer obs envffdshaubt / daif funft darnebe/ober binden. darumb da ees nit bæyte gleyd hat / alsdaned/f in strumet bye vor ver geydnet. Dud dyen et auch / wann die hyrnstalingeichla genift/das man fye mit dife instrumet wider vfffdsaub.



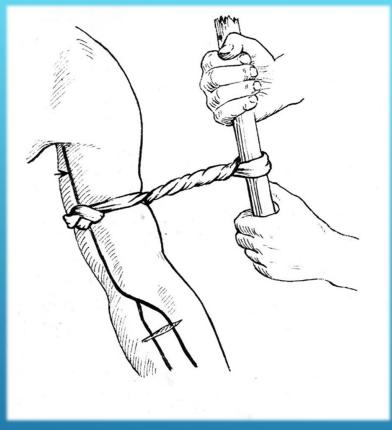


1674

Etienne Morel

- 1st description of use of a tourniquet in battle
- Stick and Bandage



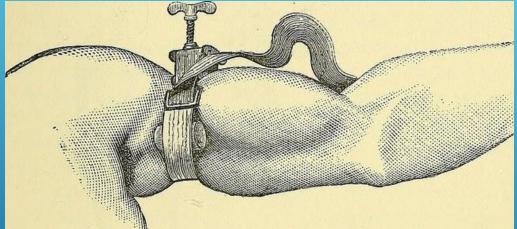


1718

Jean Louis Petit

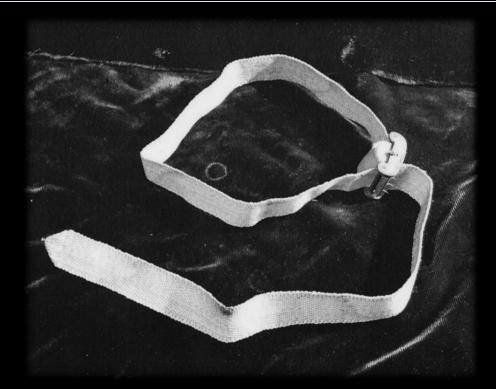
- Variable pressure tourniquet using screw device
- > fr. *tourner* (to turn)





1861-1865 CIVIL WAR

The "Prussian" belt and buckle



A MANUAL

MILITARY SURGERY;

OR.

HINTS ON THE EMERGENCIES OF FIELD, CAMP AND HOSPITAL PRACTICE.

ILLUSTRATED WITH WOOD-CUTS.

BY S. D. GROSS, M.D. PROF. OF SURGERV IN THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA.

"L'occasion est urgente, le jugement difficile." "For want of timely care, millions have died of medicable wounds."

> PHILADELPHIA: J. B. LIPPINCOTT & CO. 1861.

"It is not necessary that the common soldier carry a Petit's tourniquet, but every soldier must put into his pocket a stick of wood, six inches long, and a handkerchief...with a thick compress, and be advised how, where and when they are to be used."

MODERN DAY

- The DoD's Committee on Tactical Combat Casualty Care (CoTCCC) has approved two tourniquets
 - SOFTT-W (Special Operations Forces Tactical Tourniquet – Wide)
 - CAT (Combat Application Tourniquet)
- EVERY service member in combat has been required to carry a personal tourniquet since 2006
 - This has saved an estimated 3000 lives

SOFTT-W



CAT







Boston Marathon Bombing

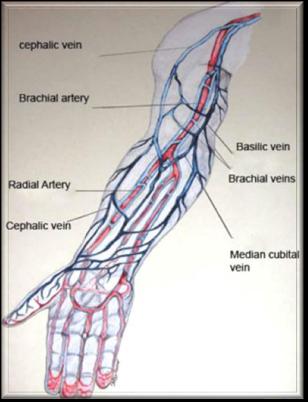
- 29 patients had life-threatening limb exsanguination
- 27 <u>improvised</u> tourniquets were applied in the field; 2/3 were applied by non-EMS personnel
- Every patient who had a tourniquet applied survived

- The majority of external bleeding can be controlled by <u>direct</u> pressure.
- A tourniquet can be left in place for <u>2 hours</u> with little risk of permanent injury.
- Application of a tourniquet for <u>longer than 2 hours</u> can result in permanent nerve injury.
 - Muscle damage is nearly complete by 6 hours, with amputation likely required.

> A properly applied tourniquet **is painful**.

- > The patient will require strong pain control medications.
- DO NOT loosen or remove the tourniquet
- A single tourniquet may not be able to control bleeding in victims with large muscular thighs or those who are obese.
 - > <u>Do not hesitate</u> to apply a second tourniquet.
 - Place the second tourniquet directly <u>above</u> and <u>adjacent</u> to the first tourniquet and tighten it until the bleeding stops.

→An incorrectly applied tourniquet will actually cause increased bleeding.





No tourniquet or gauze? Use your two hands

- > Apply heel of hand over wound.
- > Apply other hand over that hand, then lean
 - your body weight onto your hands.
- It will take TIME for the bleeding to stop usually 10 or more minutes.
- DO NOT release pressure to see if bleeding has stopped – it WILL bleed again.
- > Continue with pressure until help arrives.



WARNING! Some of the images shown during this presentation are graphic and may be disturbing to some people.

Why Do I Need This Training?





Primary Principles of Immediate Response



- Ensure your own safety
- The ABCs of Bleeding
 - **A** Alert call 9-1-1
 - **B** Bleeding find the bleeding injury

C – Compress – apply pressure to stop the bleeding by:

- 1. Covering the wound with a clean cloth and applying pressure by pushing directly on it with both hands, OR
- 2. Using a tourniquet, OR
- 3. Packing (filling) the wound with gauze or a clean cloth and then applying pressure with both hands

Primary Principles: Safety



- Before you offerany help, you must remain safe
- If you become injured, you will not be able to help the victim
- Initiate care if the scene is safe for you to do so
- If, at any time, your safety is threatened, attempt to remove yourself from danger and find a safe location
- Protect yourself from blood-borne infections by wearing gloves, if available

A • Alert

Get help

- Call 9-1-1 yourself, OR
- Tell someone to call 9-1-1

Alerting 9-1-1 will notify and get emergency medical responders and, depending on the situation, police officers to respond to the scene

ABCs of Bleeding

B • Bleeding

Find where the victim is bleeding from

• Open or remove the clothing so you can see the wound

Look for and identify "life-threatening" bleeding

- Blood that is spurting out of the wound
- Blood that won't stop coming out of the wound
- Blood that is pooling on the ground
- Clothing that is soaked with blood
- Bandages that are soaked with blood
- Loss of all or part of an arm or leg
- Bleeding in a victim who is now confused or unconscious

B • **Bleeding** (continued)

What is "life-threatening" bleeding?



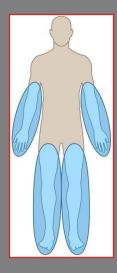
Blood spurting out of a wound



Blood soaking the sheet or clothing Photo courtesy of Norman McSwain, MD, FACS, NREMT-P.

B • **Bleeding** (continued)

Wounds That Can Lead to Death from Bleeding (1 of 3)



Arm and Leg Wounds

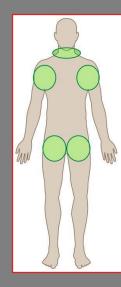
- Most frequent cause of preventable death from injury
- Bleeding from these wounds can be controlled by direct pressure or a tourniquet



Photo courtesy of Peter T. Pons, MD, FACEP.

B • **Bleeding** (continued)

Wounds That Can Lead to Death from Bleeding (2 of 3)



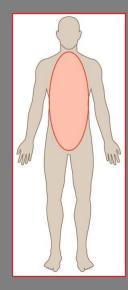
Torso Junctional Wounds

- Neck, shoulder, and groin
- Bleeding can be controlled by direct pressure and wound packing



B • **Bleeding** (continued)

Wounds That Can Lead to Death from Bleeding (3 of 3)



Chest and Abdominal Injuries

- Front, back, or side
- Usually cause internal bleeding
- This bleeding CANNOT be stopped outside the hospital
- These victims need rapid transport to a trauma center





Multiple gunshot wounds Photo courtesy of Peter T. Pons, MD, FACEP.



C • **Compression:** Stop the Bleeding





C • **Compression:** Stop the Bleeding





C • **Compression:** Stop the Bleeding





C • **Compression:** Stop the Bleeding (continued)

Direct Pressure (1 of 3)

- Use your hand or fingers
 - Use two hands, if at all possible
- Effective most of the time for external bleeding
 - Direct pressure can stop even major arterial bleeding
- Bleeding control requires very firm, continuous pressure until relieved by medical responders
- To be effective, apply pressure with the victim on a firm surface to provide support
- Don't release pressure to check the wound



C • **Compression:** Stop the Bleeding (continued)

Direct Pressure (2 of 3)

- Use any clean cloth (for example, a shirt) to cover the wound
- If the wound is large and deep, try to "stuff" the cloth down into the wound



Photos courtesy of Adam Wehrle, NREMT-P.





C • **Compression:** Stop the Bleeding (continued)

Direct Pressure (3 of 3)

- Apply continuous pressure with both hands directly on top of the bleeding wound
- Push down as hard as you can
- Hold pressure until relieved by medical responders



Photo courtesy of Adam Wehrle, NREMT-P.

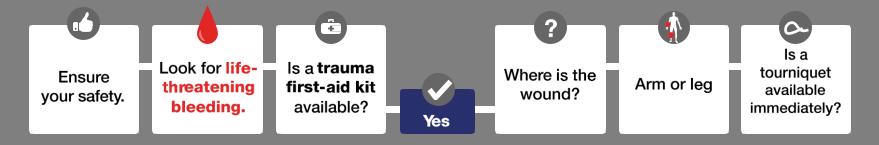
ABCs of Bleeding



ABCs of Bleeding



ABCs of Bleeding



ABCs of Bleeding



ABCs of Bleeding





C • **Compression:** Stop the Bleeding (continued)

The Tourniquet

- A tourniquet is a device that stops the flow of blood
- If applied correctly, the tourniquet will stop blood flow into the extremity and out of the wound
- Limiting blood loss may prevent the patient from going into shock or dying



Photo courtesy of Norman McSwain, MD, FACS, NREMT-P.

ABCs of Bleeding

C • **Compression:** Stop the Bleeding (continued)

Tourniquet Application

- Apply immediately if life-threatening bleeding is seen from an arm or a leg
- The tourniquet can be placed right on top of clothing, if necessary
- Place 2 to 3 inches above the bleeding wound (higher on the arm or leg)
 - BUT...
 - DO NOT apply directly over the knee or elbow joints
 - The bones of the joint will prevent the tourniquet from compressing the artery, so you won't stop the bleeding
 - DO NOT apply directly over a pocket that contains bulky items
 - Anything in a pocket that is underneath a tourniquet will interfere with the function of the tourniquet
- Tighten the tourniquet until bleeding stops



C • **Compression:** Stop the Bleeding (continued)

C.A.T. Tourniquet

The C.A.T. tourniquet is the military's preferred tourniquet because it is easy to use and can be rapidly applied



Photo courtesy of Composite Resources, Inc.



C • **Compression:** Stop the Bleeding (continued)

Application of a C.A.T. Tourniquet (1 of 9)

Step 1. Insert the wounded extremity (arm or leg) through the C.A.T.



Photo courtesy of Peter T. Pons, MD, FACEP.



Photo courtesy of Peter T. Pons, MD, FACEP.



C • **Compression:** Stop the Bleeding (continued)

Application of a C.A.T. Tourniquet (2 of 9)

Step 2. Pull the self-adhering band tight, and securely fasten it back on itself.

BE SURE TO REMOVE ALL SLACK.



Photo courtesy of Peter T. Pons, MD, FACEP.



C • **Compression:** Stop the Bleeding (continued)

Application of a C.A.T. Tourniquet (3 of 9)

Step 3. Adhere the band around the extremity. Do not adhere the band past the clip.

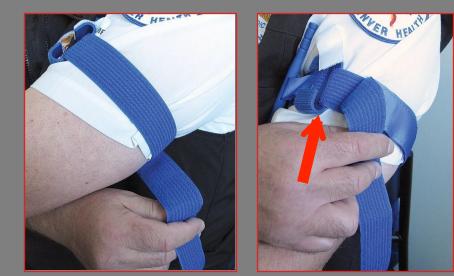


Photo courtesy of Peter T. Pons, MD, FACEP.

Photo courtesy of Peter T. Pons, MD, FACEP.



C • **Compression:** Stop the Bleeding (continued)

Application of a C.A.T. Tourniquet (4 of 9)

Step 4. Twist the windlass rod until the bleeding has stopped.



Photo courtesy of Peter T. Pons, MD, FACEP.

Introduction | Principles | A-Alert | B-Bleeding | C-Compression |



C • **Compression:** Stop the Bleeding (continued)

Application of a C.A.T. Tourniquet (5 of 9)

Step 5. Lock the windlass rod in place in the windlass clip. Bleeding is now controlled.

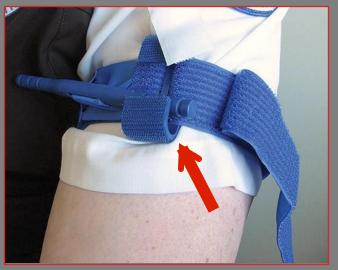


Photo courtesy of Peter T. Pons, MD, FACEP.



C • **Compression:** Stop the Bleeding (continued)

Application of a C.A.T. Tourniquet (6 of 9)

Step 6. Adhere the remaining self-adhering band over the rod, through the windlass clip, and continue around the extremity as far as it will go.



Photo courtesy of Peter T. Pons, MD, FACEP.



C • **Compression:** Stop the Bleeding (continued)

Application of a C.A.T. Tourniquet (7 of 9)

Step 7. Secure the rod and the band with the windlass strap.

Grasp the strap, pull it tight, and adhere it to the opposite hook on the windlass clip.



Photo courtesy of Peter T. Pons, MD, FACEP.



C • **Compression:** Stop the Bleeding (continued)

Application of a C.A.T. Tourniquet (8 of 9)

Step 8. Note the time the tourniquet was applied. If you have a marker, you can write it directly on the tourniquet.

The patient is now ready for transport.



Photo courtesy of Peter T. Pons, MD, FACEP.

 If the bleeding is not stopped with one tourniquet and it is as tight as you can get it, place a second one, if available, just above the first and tighten as before



Key Points

- No amputations have been caused by a tourniquet when left in place for fewer than two hours
 - BUT... it is best to get the patient to a trauma center as soon as possible so the bleeding can be completely controlled and the tourniquet removed
- Better to risk damage to the arm or leg than to have a victim bleed to death
- Training (practice) tourniquets should NOT be used during a real patient incident
 - Repetitive use during training exercises may cause the tourniquet to fail

Tourniquet Pain

- Tourniquets HURT when applied effectively (they HURT A LOT)
 - Explain this fact to the victim
- Pain DOES NOT mean you put on the tourniquet incorrectly
- Pain DOES NOT mean you should take the tourniquet off
- Once paramedics arrive, they will treat the pain with medication

Common Mistakes

- Not using a tourniquet or waiting too long to apply it when there is life-threatening bleeding
- Not making the tourniquet tight enough to stop the bleeding
- Not using a second tourniquet, if needed
- Periodically loosening the tourniquet to allow blood flow to the injured extremity
 - Causes unacceptable additional blood loss DO NOT LOOSEN
- Removing a tourniquet
 - Only a paramedic or physician should loosen or remove it

ABCs of Bleeding

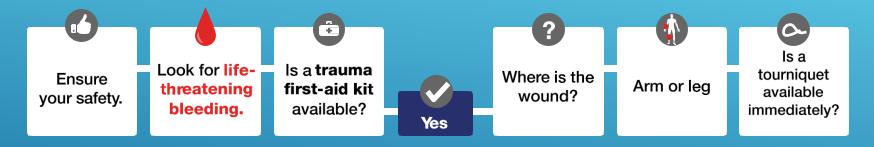
C • **Compression:** Stop the Bleeding (continued)

Tourniquet Practice

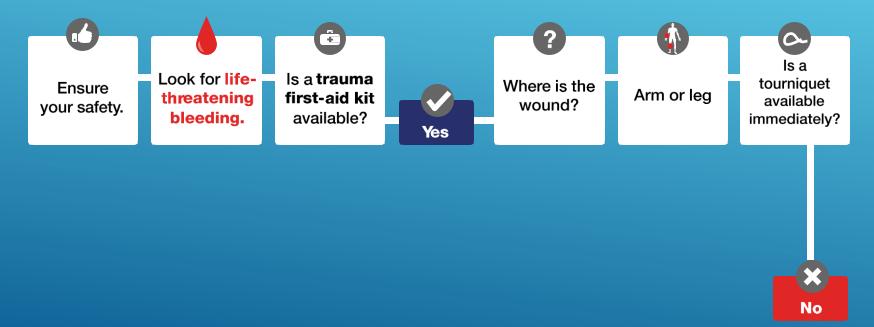
Bleeding Control Basic v. 1.0

Introduction | Principles | A-Alert | B-Bleeding | C-Compression

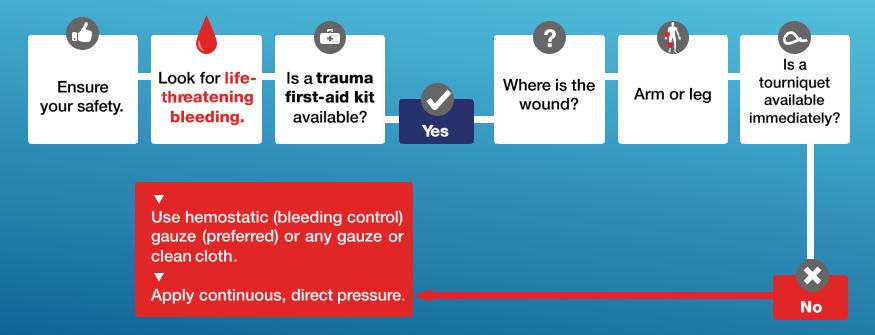
ABCs of Bleeding



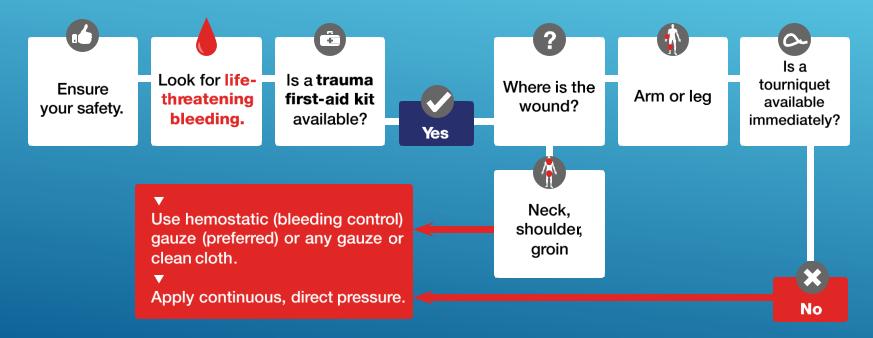
ABCs of Bleeding



ABCs of Bleeding



ABCs of Bleeding



ABCs of Bleeding

C • **Compression:** Stop the Bleeding (continued)

Hemostatic Dressings (Bleeding Control Dressings)

- Hemostatic dressings are materials that help cause blood to clot
- Examples of hemostatic dressings include:
 - QuikClot (civilian) / Combat Gauze (military)
 - Celox
 - Celox Rapid
 - Chitoflex
 - Chitogauze



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Photo courtesy of Peter T. Pons, MD, FACEP.

ABCs of Bleeding

C • **Compression:** Stop the Bleeding (continued)

Wound Packing (1 of 5)

- Open clothing around the wound
- If possible, remove excess pooled blood from the wound while preserving any clots already formed in the wound
- Locate the source of the most active bleeding



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C • **Compression:** Stop the Bleeding (continued)

Wound Packing (2 of 5)

- Pack the wound
 - Hemostatic dressing, OR
 - Gauze roll, OR
 - Clean cloth
- Stuff right into the wound and directly onto the bleeding site

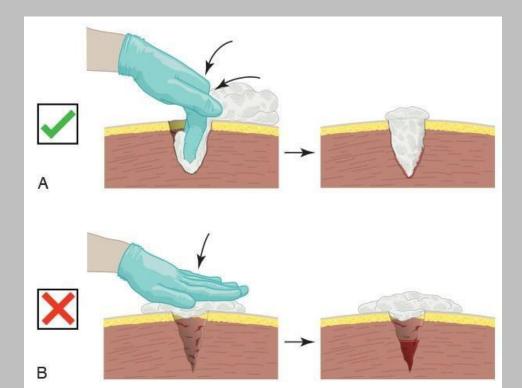


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C • **Compression:** Stop the Bleeding (continued)

Wound Packing (3 of 5)



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ABCs of Bleeding

C • **Compression:** Stop the Bleeding (continued)

Wound Packing (4 of 5)

- Quickly apply and hold pressure directly on the packed wound until relieved by medical responders
- If initial packing and direct pressure fail to stop the bleeding, pack a second gauze on top of the first and reapply pressure using increased force



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➢Pack deeply

Gauze must make <u>direct</u> <u>contact</u> with bleeding vessels at base and sides of wound

The most common mistake with wound packing is being timid.

BE BOLD – pack it good



ABCs of Bleeding

C • **Compression:** Stop the Bleeding (continued)

Wound Packing Practice

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Introduction | Principles | A-Alert | B-Bleeding | C-Compression



- In all but the extremely young child, the same tourniquet used for adults can be used in children.
- For the infant or very small child (tourniquet too big), direct pressure on the wound as described previously will work in virtually all cases.
- For large, deep wounds, wound packing can be performed in children just as in adults using the same technique as described previously.

Blood Exposure



- After arrival of medical responders, if you have any blood on you:
 - Wash thoroughly with soap and water to remove all blood, AND
 - Notify medical responders of possible exposure

Summary



- Ensure your own safety
- The ABCs of Bleeding
 - A Alert call 9-1-1
 - **B** Bleeding find the bleeding injury
 - **C** Compress apply pressure to stop the bleeding by:
 - 1. Covering the wound with a clean cloth and applying pressure by pushing directly on it with both hands, OR
 - 2. Using a tourniquet, OR
 - 3. Packing (filling) the wound with gauze or a clean cloth and then applying pressure with both hands





The only thing more tragic than a death... is a death that could have been prevented.

Thank you for your participation. Questions?

Bleeding Control Basic v. 1.0



Personal bleeding control kits



BLEEDINGCONTROL.ORG



BLEEDINGCONTROL.ORG

Wall-mounted bleeding control kits



For further information and additional resources, please visit

BLEEDINGCONTROL.ORG





Reminders

- Access to the presentation
- Evaluations
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- Special Announcements

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