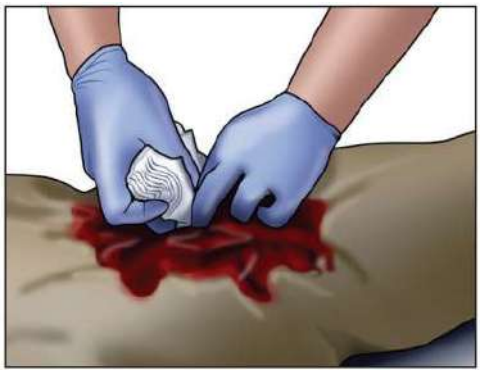




Wound Packing

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Thank you, Justin – we are now going to discuss wound packing.
When a wound is deep, or when it tunnels under the skin, packing the wound can help to control bleeding.
The U.S. military has been using wound packing with standard gauze and hemostatic dressings for years. Like the transition of tourniquets from the military to civilian EMS, these skills are now becoming adopted by tactical EMS teams as well as field EMTs and Paramedics.
Wound packing can be utilized together with tourniquet use. Or as a solo hemorrhage management technique if it sufficiently stops the bleed. It is also an immediate option if a tourniquet is not readily available.
In this lesson, we will first examine wounds not amenable to tourniquets. We then look at the various hemostatic products and their usage. We finish by discussing a procedure for wound packing.
Good studying.

Wound Packing

- Some wounds are not amenable to tourniquets or pressure dressings alone
- Filling the wound cavity aids in creating pressure on bleeding vessels



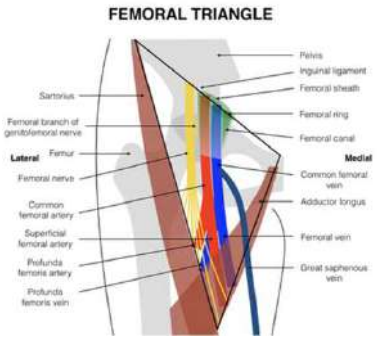
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So, some wounds are not amenable to tourniquets or pressure dressings alone. In these situations, filling the wound cavity aids in creating pressure on bleeding vessels.
Using direct pressure and tourniquets on extremity bleeding is relatively straightforward for EMS providers.
However, the most challenging wounds are those in the junctional areas. That is the groin and the axilla, where tourniquets can't be used.
The bleeding in these locations is often deeper. As a result, maintaining adequate external pressure may be difficult or impossible at times. Hence, these would be situations where wound packing would be the most logical bleeding control technique.
We examine two of these areas to be aware of, in the next slides.

CRITICAL VASCULAR AREA | FEMORAL TRIANGLE

- From NIH: The femoral triangle in the anterior superior third of the thigh is a sub-fascial space that appears as a triangular depression inferior to the inguinal ligament
- The depression is visible when the thigh is abducted, flexed, and laterally rotated



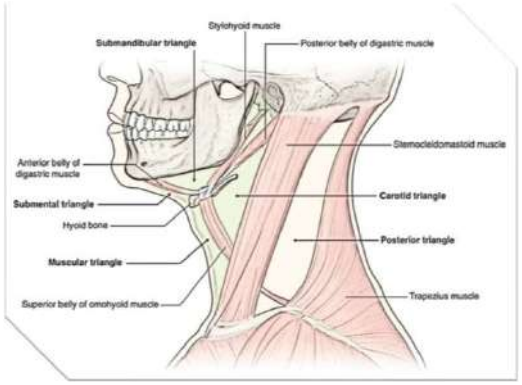


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The first critical vascular area not suitable for tourniquets is the Femoral Triangle. According to the NIH, the femoral triangle in the anterior superior third of the thigh is a sub-fascial space that appears as a triangular depression inferior to the inguinal ligament.
The depression is visible when the thigh is abducted, flexed, and laterally rotated.

Critical Vascular Area | Anterior Triangle of the Neck

- The anterior triangle is the triangular area of the neck found anteriorly to the sternocleidomastoid muscle
- It is formed by the anterior border of sternocleidomastoid laterally, the median line of the neck medially and by the inferior border of the mandible superiorly



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The second critical vascular area not suitable for tourniquets is the Anterior Triangle of the Neck.
The anterior and posterior triangles of the neck provide a natural framework to organize the numerous contents of the neck into well-defined anatomic subdivisions. The muscles, bones, and fascia of the cervical region form natural boundaries that enclose various other structures, including muscles, nerves, vasculature, and lymphatics.
The anterior triangle is the triangular area of the neck found anteriorly to the sternocleidomastoid muscle.
It is formed by the anterior border of sternocleidomastoid laterally, the median line of the neck medially and by the inferior border of the mandible superiorly.

Wound Packing – Why?

- Placing gauze into a wound creates pressure against bleeding vessels and encourages clotting
- Hemostatic dressings are preferred but any sterile gauze can be used for wound packing



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Now, why do we perform wound packing?
So, placing gauze into a wound creates pressure against bleeding vessels and encourages clotting.
Hemostatic dressings are preferred, but any sterile gauze can be used.
Make sure to note how many gauze pads you are using so you can pass that information on to responding EMS. Once the patient is at the hospital, this could be vital information to give to the medical staff who will ultimately work to close the wound.

When Considering Wound Packing

- Do not pack wounds of the abdomen and chest or open skull fractures
- Only for use on limbs, neck, shoulders, hips and groin
- Use hemostatic products for wound packing if available and in accordance with manufacturers recommendations
- Pack wound and hold direct pressure according to the manufacturer's recommendation



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When considering wound packing:
Do not pack wounds of the abdomen and chest or open skull fractures.

- Placing additional pressure on skull fractures could push any loosened bone fragments into the brain.
- Packing wounds of the abdomen poses a further risk of injury to any tissues or organs that have already suffered damage during the trauma.

Wound packing is only for use on limbs, neck, shoulders, hips, and groin.
Use hemostatic products for wound packing if available and in accordance with the manufacturer's recommendations.
Finally, Pack the wound and hold direct pressure according to the manufacturer's recommendation.

Hemostatic Agents

- What: Chemical impregnated gauze incorporating chemicals designed to promote rapid blood coagulation
- Why: Hemostatic agents can establish hemostasis by means of different mechanisms:
  - ✓ Concentrating coagulation factors
  - ✓ Adhesion to the tissues
  - ✓ Delivering procoagulant factors to the hemorrhage site



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Hemostatic Agents generally come in the form of Chemical impregnated gauze, incorporating compounds designed to promote rapid blood coagulation.
QuikClot is the most used brand of hemostatic agents. QuikClot devices are indicated as a topical dressing for the local management of bleeding wounds such as cuts, lacerations, and abrasions.
They may also be used for temporary treatment of severely bleeding wounds such as operative, postoperative, and dermatologic surgical wounds as well as traumatic injuries.

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CELOX PRODUCTS

- CeloxRapid (30-45 sec)
- CeloxTrauma Gauze
- Celoxpowder



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Illustrated are Various forms of Celox products. Celox is another popular manufacturer of hemostatic agents currently used by EMS.
According to their manufacturing label, the current generation of hemostatic agents need at least 3 minutes of compression to work.
Celox claims that their gauze will accomplish stopping severe bleeding in just 60 seconds. With any product, despite the manufacturer, rapid action of the responder will ultimately reduce blood loss and improve the overall patient outcome.

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QUIKCLOT GAUZE

- Standard surgical gauze impregnated with Kaolin
- Promotes coagulation through coagulation cascade





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Shown here is QuikClot Gauze.
Now, let's compare the Celox brand to the QuikClot brand. What is the difference? While Celox works independently of the body's natural clotting cascade. QuikClot works with the natural clotting mechanism to help form clots better.
QuikClot products contain a concentrated dose of a clotting factor naturally found in the blood that activates the clotting cascade within the body.

CHITOGAUZE

- Chitosan based impregnated gauze
- HemCon ChitoGauze PRO is a flexible hemostatic chitosan coated gauze dressings intended to stop severe bleeding and reduce blood loss within minutes
- ChitoGauze PRO provides immediate bleeding control and best possible patient care in emergency, trauma and battlefield situations

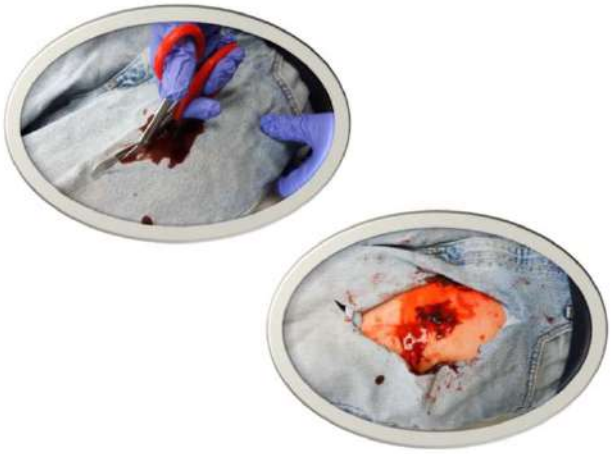


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Now, let's look at Chitosan-based impregnated gauze.
Chitosan is a sugar that is obtained from the hard-outer skeleton of shellfish, including crab, lobster, and shrimp. It is used in medicine to treat obesity, high cholesterol, high blood pressure, and Crohn's disease.
Chitosan is a promising hemostatic agent because it can stick to the red blood cells and encourage platelets to adhere, activate, and aggregate at the site of vascular injury.
HemCon ChitoGauze PRO is a flexible hemostatic chitosan-coated gauze dressing intended to stop severe bleeding and reduce blood loss within minutes.
ChitoGauze PRO provides immediate bleeding control and the best possible patient care in emergency, trauma, and battlefield situations.

Wound Packing Procedure | #1 – Locate, Expose, Identify

- Expose Wound and Identify Bleeding
- Open Clothing around the wound
- 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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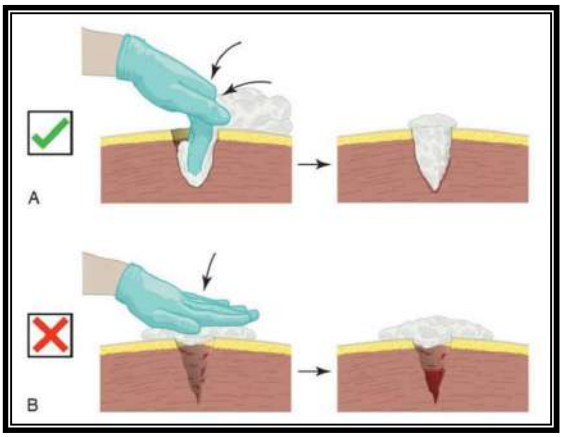
So, now we review our Wound Packing procedure over 5 slides. The five-step process is:

1. Locate, Expose and Identify the Wound
2. Understand best practices to pack and maintain pressure
3. Completely Pack the wound
4. Apply direct pressure
5. Apply a pressure dressing

We begin by exposing the wound and Identify the Bleeding. The Next step is to Open the Clothing around the wound.
Then, remove any excess pooled blood from the wound while preserving any clots already formed. Finally, locate the source of the most active bleeding.

Wound Packing Procedure | #2 – Best Practices

- Use one gloved hand to feed gauze and the other to maintain pressure and hold gauze in place
- Use gloved fingers to maintain pressure and hold gauze. Proper technique will allow for continuous pressure
- Be cautious of sharp fracture edges and foreign bodies when packing wounds!



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Now, let's examine the diagram showing best practices. The top shows how to use your gloved fingers to insert the gauze and maintain pressure. The bottom diagram shows how not to do this.
So to ensure that you Pack the Wound Completely, be sure to use one gloved hand to feed gauze and the other to maintain pressure and hold the gauze in place
Use gloved fingers to maintain pressure and hold the gauze. Proper technique will allow for continuous pressure.
Finally, be cautious of sharp fracture edges and foreign bodies when packing wounds!

Wound Packing Procedure | #3 – Pack Wound Completely

- Pack gauze tightly into wound and directly onto the source of bleeding
- More than one gauze may be required



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Next, it is important to pack the Wound Completely or blood will pool.
Pack the gauze tightly into the wound and directly onto the source of the bleeding.
More than one gauze pad or roll may be required.

Wound Packing Procedure | #4 – Apply Direct Pressure

- Apply and hold continuous direct pressure
- The time to hold pressure will be longer when not using hemostatic gauze
- Reassess bleeding while holding continuous direct pressure



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Step 4 in our wound packing procedure is to Apply Direct Pressure. And we must hold continuous direct pressure until the bleed is controlled.
Remember, the time to hold pressure will be longer when not using hemostatic gauze.
Finally, reassess bleeding every minute or two, while holding continuous direct pressure.

Wound Packing Procedure | #5 – Place Bandage Over Gauze

- Apply a pressure dressing to provide ongoing pressure and secure the wound packing in place
- Transport and Monitor
- Do not remove the bandage or gauze
- If practical – attach gauze wrapper to pressure dressing so that the next care provider is aware gauze is in place in wound

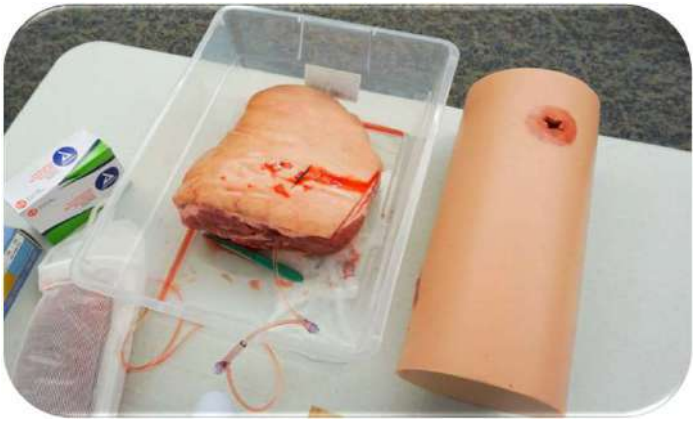


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The last step of this procedure is to place a bandage over the gauze to hold it in place. Then, if available, apply a pressure dressing to provide ongoing tension and secure the wound packing in place.
Next, when appropriate, we should Transport the patient and Monitor.
Of course, be sure not to remove the bandage or gauze en route.
Finally, if practical, attach the gauze wrapper to the pressure dressing so that the next care provider is aware that gauze is packed into the wound.

Time to Practice – Hands on Session

- Put it all together (wound pack and pressure dressing)
- Skills session



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Now it is time to put together wound packing and the use of a pressure dressing.
Grab a nice beef roast or commercial Stop the Bleed leg and let's get packing!
Depending on the course you are taking, there will be a skills station for practice and coaching.
Check with the course instructor on location and time.
So, this is the end of our lesson on Wound Packing.
Justin will be with you next to discuss pressure dressings in depth.
See you soon – good studying.