

Trauma Injury Curriculum



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This curriculum, accompanying Trauma Injury Simulator, and student worksheets will help participants recognize the signs of life-threatening bleeding, describe how to access the injury site, and apply tourniquets to upper and lower extremities to stop bleeding in a realistic simulation experience.

Author



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In addition to her fire service career, Krista has worked as a Mental Health Technician in psychiatric and crisis settings, served as a Drill Instructor and Field Training Officer for multiple agencies, and taught CPR, First Aid, PALS, BLS, and ALS courses. She also held the role of EMS Captain for a rural fire department.

Now retired from active duty, Krista is passionate about sharing her knowledge and experience with those pursuing careers in healthcare and emergency services.

Curriculum Structure

The *Trauma Injury Curriculum* is composed of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	Identifying Life-Threatening Bleeding	45 minutes
Two	Proper Tourniquet Placement and Application	45 minutes
Three	Understanding the “Why” of Tourniquet Use	45 minutes
Four	Tourniquet Equipment and Variations	45 minutes
Five	Post-Application Care and Communication	45 minutes
	Total	3-4 hours

Lesson Structure

Each lesson begins with a Lesson Overview, Lesson Objectives, and a Lesson at a Glance table, which lists the lesson activities, materials required, suggested preparation steps, and approximate class time.

Lesson Sections

The actual lesson follows the overview, which will contain some of the sections described below. All lessons are designed to be completed within 45 minutes.

FOCUS

Every lesson begins with a FOCUS activity intended to capture participants' attention. This may be in the form of a small or large class discussion, a game, a review of previous lesson information, or a demonstration. During this activity, participants are introduced to the topic of the lesson.

LEARN

The LEARN activity in each lesson varies in its presentation mode. It may be a slide presentation, group activity, or demonstration.

REVIEW

The majority of lessons end with a REVIEW activity intended to briefly review the lesson's key messages or main points.

Lesson One – Identifying Life-Threatening Bleeding

Lesson Overview

In this lesson, students will learn how to identify different types of bleeding and recognize when bleeding becomes life-threatening. They will understand the characteristics of arterial, venous, and capillary bleeding, discover the critical signs and symptoms that indicate severe blood loss, and identify how rapid recognition impacts patient outcomes.

Lesson Objectives

After completing this lesson, participants will be able to:

- Recognize the difference between arterial, venous, and capillary bleeding
- Identify when bleeding is life-threatening
- Understand how rapid recognition and treatment impact patient outcomes

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• <i>Developing Critical Thinking</i> worksheet • <i>Developing Critical Thinking</i> – Answer Key • <i>Identifying Life-Threatening Bleeding Test</i>	1. Print/photocopy the <i>Developing Critical Thinking</i> (one per participant). 2. Print/photocopy the <i>Identifying Life-Threatening Bleeding Test</i> (two per participant). 3. Access the worksheet answer key.	10 minutes
LEARN	• <i>Lesson 1</i> slide presentation	1. Prepare the <i>Lesson 1</i> slide presentation for viewing.	15 minutes
REVIEW	• <i>Lesson 1</i> slide presentation (for review) • <i>Identifying Life-Threatening Bleeding Scenarios</i> worksheet • <i>Identifying Life-Threatening Bleeding Scenarios</i> – Answer Key • <i>Identifying Life-Threatening Bleeding Test</i> • <i>Identifying Life-Threatening Bleeding Test</i> – Answer Key	1. Print/photocopy the <i>Identifying Life-Threatening Bleeding Scenarios</i> worksheet (one per participant). 2. Access the answer keys.	20 minutes

Instructor Note: Focus activities may be completed prior to class.

Lesson One – Identifying Life-Threatening Bleeding

FOCUS: Developing Critical Thinking and Decision-Making Skills Worksheet

10 minutes

Purpose:

Help students develop critical thinking and decision-making skills.

Materials:

- *Developing Critical Thinking* worksheet
- *Developing Critical Thinking* – Answer Key
- *Identifying Life-Threatening Bleeding Pre-Test*

Facilitation Steps:

1. Distribute the *Developing Critical Thinking* worksheets before or at the beginning of class and have the answer key available.
2. Distribute two copies of the *Identifying Life-Threatening Bleeding Test* to each participant and explain that upon your instruction, one is to be taken at the start of class and one at the end.
3. Have students read the information and complete the worksheet and pre-test. Information from the pre-test can be compared with information from the post-test, which participants will take upon completion of the lesson to measure changes in their knowledge.
4. Have students pair up after completion and share answers from the worksheet.

Developing Critical Thinking

Purpose: To develop critical thinking and decision-making skills

READ the following:

You are an EMT working on a busy Saturday night when your crew is dispatched to a local park to help an injured person. Upon arrival, you find a teenager named Rebecca sitting on the ground, holding her leg. She was skateboarding when she crashed into a metal rail. There is bright red blood spurting from a deep wound in her thigh, and her jeans are soaked with blood. Rebecca is pale, breathing rapidly, and struggling to answer your questions.

While you and your partner are applying direct pressure and cutting off her pants to expose the wound, Rebecca's friends crowd around, panicking and shouting at you to help their friend. The bleeding continues heavily despite direct pressure. You know you must act quickly to save her life. You apply a tourniquet high on her thigh and reassess. The bleeding slows, and Rebecca's breathing becomes more regular. You prepare her for immediate transport to the hospital.

REFLECT on the situation:

What emotions do you think Rebecca is feeling?

What emotions do you think you would feel in this situation?

Why is it critical to recognize life-threatening bleeding immediately?

What would you do if direct pressure did not immediately stop the bleeding?

SHARE your thoughts with a peer when it's discussion time.

Developing Critical Thinking – Answer Key

Purpose: To develop critical thinking and decision-making skills

READ the following:

You are an EMT working on a busy Saturday night when your crew is dispatched to a local park to help an injured person. Upon arrival, you find a teenager named Rebecca sitting on the ground, holding her leg. She was skateboarding when she crashed into a metal rail. There is bright red blood spurting from a deep wound in her thigh, and her jeans are soaked with blood. Rebecca is pale, breathing rapidly, and struggling to answer your questions.

While you and your partner are applying direct pressure and cutting off her pants to expose the wound, Rebecca's friends crowd around, panicking and shouting at you to help their friend. The bleeding continues heavily despite direct pressure. You know you must act quickly to save her life. You apply a tourniquet high on her thigh and reassess. The bleeding slows, and Rebecca's breathing becomes more regular. You prepare her for immediate transport to the hospital.

REFLECT on the situation:

What emotions do you think Rebecca is feeling?

I think Rebecca would feel scared, in pain, confused, and possibly fearful that she might die.

What emotions do you think you would feel in this situation?

I would feel urgency and concern for Rebecca's safety. I might also feel a little pressure or stress knowing how quickly decisions must be made in life-threatening situations.

Why is it critical to recognize life-threatening bleeding immediately?

It is critical to recognize life-threatening bleeding immediately, as severe bleeding can lead to shock and death within minutes if not controlled. Early recognition allows life-saving interventions to happen before it's too late.

What would you do if direct pressure did not immediately stop the bleeding?

I would recognize that direct pressure alone is not sufficient for arterial bleeding and quickly apply a tourniquet above the wound to control the hemorrhage.

SHARE your thoughts with a peer when it's discussion time.

Name: _____

Class: _____

Identifying Life-Threatening Bleeding Test

Instructions: Select the best answer to the multiple-choice questions below.

1. Which of the following is considered a sign of life-threatening bleeding?
 - a. Bruising on the arm
 - b. A slow oozing scrape
 - c. Blood soaking through bandages rapidly
 - d. A nosebleed
2. Arterial bleeding is dangerous because it:
 - a. Usually stops on its own
 - b. Can be treated with ice packs
 - c. Spurts bright red blood and is hard to control
 - d. Is less severe than capillary bleeding
3. Which describes the “Golden Hour”?
 - a. The first 60 minutes after a traumatic injury
 - b. The last 60 minutes after a severe injury
 - c. The time it takes to get a trauma patient to the hospital
 - d. The time it takes to achieve severe blood loss
4. What is a common sign of shock from blood loss?
 - a. High blood pressure
 - b. Pink, warm skin
 - c. Restlessness and confusion
 - d. Nausea after eating
5. When should you apply a tourniquet?
 - a. For minor scrapes or capillary bleeding
 - b. When direct pressure does not stop life-threatening bleeding
 - c. After placing an ice pack on the injury
 - d. Only if the person asks for it

Lesson One – Identifying Life-Threatening Bleeding

LEARN: Slide Presentation

15 minutes

Purpose:

Participants will receive a thorough introduction to the different types of bleeding, how to recognize life-threatening bleeding, understand when immediate intervention is needed, and prioritize patient care based on bleeding severity.

Materials:

- Lesson 1 slide presentation

Facilitation Steps:

Share the following information as you show the slide presentation.

Slide 1: Identifying Life-Threatening Bleeding
Welcome, everyone! Today, we are going to dive into one of the most important skills in emergency care: how to identify life-threatening bleeding. This knowledge can potentially save lives, whether you are a healthcare professional or someone who just wants to be prepared. So, let's get started with Lesson 1: Identifying Life-Threatening Bleeding.

Slide 2: Objectives

By the end of this lesson, you will be able to differentiate between arterial, venous, and capillary bleeding, identify signs of life-threatening external bleeding, recognize when immediate intervention is needed, and prioritize patient care based on bleeding severity.

Slide 3: Why This Matters

When someone is bleeding heavily, they can lose a life-threatening amount of blood in just a few minutes. That is why it is so important to identify severe bleeding and respond immediately. We are not just treating an injury—we are buying time for that person to survive.

Slide 4: Types of Bleeding

Now, let's break down the three main types of bleeding you will encounter, because not all bleeding is created equally. Each type has distinct characteristics, and some are more dangerous than others.

Let's start with **arterial bleeding**. This is the most serious type. The blood is bright red and spurts with each heartbeat. That is because it is coming straight from the arteries, which carry oxygen-rich blood under high pressure. It can be dramatic—like something you would see in a movie—and it can be fatal very quickly if it is not controlled.

Next is **venous bleeding**. This blood is darker red and flows more steadily, without spurting. It comes from the veins, which are under less pressure than arteries. Venous bleeding can still be serious, especially if a large vein is involved, but it is typically easier to control than arterial bleeding.

Finally, there is **capillary bleeding**. This is the most common and least dangerous. It is that slow oozing you get from a scraped knee or a shallow cut. It usually stops on its own or with a little bit of direct pressure.

Quick Recap: Bright and spurting? That's arterial. Get help or act fast. Dark and steady? That's venous, still serious, but more manageable. Slow and oozing? That's capillary, probably not life-threatening. The type of bleeding you see helps guide your next steps in care.

Slide 5: Arterial Bleeding

Let's take a closer look at arterial bleeding. This is the one that should really grab your attention. It is the most dangerous. Why? Because arteries carry oxygen-rich blood away from the heart and under a lot of pressure.

That's why the blood is bright red—it's loaded with oxygen—and it tends to spurt out rhythmically with each heartbeat. It is not just dripping, it is shooting. If you ever see this kind of bleeding, you need to act fast. It can lead to severe blood loss in just a few minutes. Direct pressure might work, but often you will need a tourniquet to stop the flow. This is a true emergency. If you do nothing, the patient could bleed out quickly.

Slide 6: Venous Bleeding

Next is venous bleeding. This comes from veins, which return blood back to the heart. The pressure in veins is lower than in arteries, so you will not see spurting—but you will see a steady, dark red flow.

Even though it's not spurting, it can still be serious, especially if a large vein is involved, like one in the neck or thigh. These can bleed out a lot of blood quickly if not controlled.

The good news is that venous bleeding usually responds well to direct pressure. You typically will not need a tourniquet unless it is very severe. Just hold steady pressure with gauze or a clean cloth, and do not let up too early. If blood soaks through the bandage, you can apply more—just do not remove the original dressing as it can interrupt the clotting process and the bleeding will restart.

Slide 7: Capillary Bleeding

Last is capillary bleeding. This is the kind you are probably most familiar with. It happens when you scrape your knee or get a minor cut. Capillaries are the smallest blood vessels, and bleeding from them is usually just a slow ooze.

The blood might be a mix of red shades and usually does not gush or spurt. Capillary bleeding often closes on its own, and it is not typically life-threatening. That said, even minor wounds must be cleaned properly to prevent infection. While this type of bleeding does not require the same emergency response, it still deserves care and attention, especially in older adults or people with compromised immune systems.

Slide 8: What Is Life-Threatening Bleeding?

Life-threatening bleeding is bleeding that will not stop on its own or that causes the person to go into shock. It usually involves arteries, the vessels that carry blood away from the heart, so the bleeding tends to be fast, forceful, and hard to control. Signs of life-threatening bleeding include:

- Spurting or pulsating flow of blood
- Pooling of blood on the ground
- Blood soaking clothing or bandages
- Uncontrolled bleeding despite direct pressure
- Signs of shock (pale, cool skin, altered mental status)

Slide 9: Internal Versus External Bleeding

Not all life-threatening bleeding is visible. External bleeding is what you can see, like from a cut or a wound. But internal bleeding can be just as severe. Look for signs like swelling, bruising, or shock in someone with no obvious external injuries. Be alert to mechanisms of injury (MOIs) like falls or blunt trauma, which happens when someone is hit with an object.

Slide 10: Common Causes of Life-Threatening Bleeding

Common causes of life-threatening bleeding include car crashes, falls, penetrating injuries (like stabbings or gunshots), and industrial or workplace accidents. In some cases, medical conditions or medications that prevent clotting can make even a small cut dangerous.

Slide 11: Signs of Shock from Blood Loss

When the body starts losing a lot of blood, the heart pumps faster to try to maintain circulation, breathing speeds up, and the person may become pale, dizzy, or confused. These are signs of shock, a critical condition that requires immediate action. The signs include:

- Increased heart rate (tachycardia)
- Low blood pressure (hypotension)
- Pale, cool, clammy skin
- Altered mental status (confusion, anxiety)

Slide 12: When to Take Immediate Action

This is our “drop everything and act now” checklist. These are the signs that bleeding has gone from serious to life-threatening.

First, if blood is spurting from a wound, you are likely looking at arterial bleeding, and that can lead to death in minutes. Do not wait—apply pressure immediately and use a tourniquet if needed.

Next, if blood is soaking through dressings or clothing rapidly, that is a huge red flag. It means your initial efforts are not working. You need to reinforce the dressings—do not remove them, just add more on top—and keep firm, continuous pressure.

If the patient is unresponsive or confused, that might mean the brain is not getting enough oxygen—possibly from blood loss. That is a sign of shock setting in, and it needs to be treated right away with positioning, oxygen if available, and fast transport to the hospital. This is where 911 needs to be called immediately.

We also need to watch for hypoperfusion—cold skin, weak pulses, rapid breathing. Those are signs the body is shutting down. And finally, if direct pressure is not working, it is time to go for the tourniquet until 911 arrives.

Bottom Line: Do not delay when you see these signs. These patients cannot wait.

Slide 13: Scene Size-up and Bleeding Assessment

Before we jump into treating anything, we always start with the basics—scene size-up. This is where your bleeding assessment really begins.

First, protect yourself. Bleeding calls mean blood—and lots of it. That requires gloves on and standard precautions in place. Think goggles, gowns, maybe even masks if there is potential for splattering. You cannot help anyone if you become the next patient.

Now, as you approach the scene, keep your eyes open for clues. Is there visible blood anywhere? Look for pooling under the patient, splatter patterns, or blood trails—especially in trauma scenes. These can help you figure out what happened and how severe the bleeding might be before even touching the patient.

Once you are hands-on, do a quick body sweep. You would be surprised how often major bleeding is missed, especially in areas like the back, groin, or under bulky clothing. If your gloves come back bloody, you have found something you need to address right away.

Expose the wound; this is key. You cannot assess or treat what you cannot see. Do not be shy. Cut away clothing and get eyes on the wound fast. That is the only way to accurately determine the location, type of bleeding, and how much damage you are dealing with.

Remember: Scene safety, visual clues, full-body checks, and exposing the wound. Those are your first critical steps in managing any bleeding emergency.

Slide 14: Golden Hour

The Golden Hour is a concept that is taken seriously in emergency medicine. It is the idea that a trauma patient’s best chance at survival happens when healthcare providers intervene within the first 60 minutes of injury. Now, this is not just some random timeframe—it is based on decades of evidence showing that rapid care saves lives.

During that hour, every second counts, especially with major bleeding. If blood loss is not controlled quickly, the patient’s body starts to shut down. Oxygen delivery is compromised, organs begin to fail, and the clock starts working against you.

That is why we assess quickly, treat what we can on scene, and make smart decisions about transport. This is where the term “load and go” comes in—if the bleeding is severe or the patient is unstable, you cannot waste time. You must get them moving toward definitive care, which is usually a trauma center.

So, when you hear “Golden Hour,” think of it as your window of opportunity to act fast, control bleeding, and make quick transport decisions. If you are not a healthcare professional and see someone is bleeding heavily and it will not stop, or they are showing signs of shock, call 911 immediately. You can start helping, but you also need advanced medical care on the way.

Slide 15: Arm Laceration Scenario

All right, let’s walk through this scenario together. We have a patient who fell through a glass window and now has a large laceration to the inner arm. You notice *bright red blood spurting* from the wound. What does that tell us?

This is arterial bleeding. Arterial blood is oxygen-rich, so it appears bright red, and the spurting you see typically matches the rhythm of the heartbeat. This is a life-threatening emergency because someone can bleed out in just minutes if this is not controlled right away.

So, what do we do immediately? We need to act fast. First, apply firm, direct pressure to the wound. Use a clean dressing, if possible, but your gloved hand will work in an emergency. If direct pressure does not control the bleeding, the next step is to consider using a tourniquet, placed high above the wound, close to the torso, and tightened until the bleeding stops. We will cover this in greater depth in the following lesson.

Also, do not forget your standard precautions—gloves on before touching the patient. Always be aware of your surroundings and scene safety.

Let’s pause and talk as a group. What might be some complications with this injury? How would you stay calm and focused under pressure?

Slide 16: Knee Injury Scenario

Here is another real-world scenario. A cyclist has taken a fall and landed hard on the pavement. There’s moderate bleeding from the knee, but importantly—no active spurting, and the patient is alert and oriented.

So, is this life-threatening?

No—it does not appear to be. This bleeding is likely venous or capillary, which means it can typically be controlled without advanced interventions. Still, we do not ignore it. Any open wound is a risk for infection, and we still need to act promptly.

What is the next step?

First, make sure you have your standard precautions in place—gloves on. Then, apply direct pressure to control the bleeding. Once the bleeding is controlled, clean the wound, if possible, dress it appropriately, and monitor for signs of worsening.

Also, take a moment to assess for other injuries—did the patient hit their head? Are there signs of road rash or embedded debris? Just because the bleeding is not life-threatening does not mean we skip the full assessment.

This is a great opportunity to discuss prioritization. When you are faced with multiple injuries, how do you decide what needs immediate attention and what can wait?

Slide 17: Review

Let’s take a moment to put everything together.

First, know your bleed types. Arterial, venous, and capillary bleeding each look different and require different levels of urgency. Arterial is bright red and spurting—that is your red flag. Venous is darker and steady but still dangerous. Capillary is oozing and typically minor.

Second, always watch for signs of shock. Cool, pale, clammy skin, rapid pulse, altered mental status, those are clues that your patient is losing more blood than you think, even if the bleeding does not look dramatic on the surface. Who knows, they could have internal bleeding that you cannot see.

Third, act quickly. Life-threatening bleeding requires fast intervention—this is not the time to hesitate. Direct pressure first, then a tourniquet if needed. The clock starts ticking the second the patient starts bleeding. Remember the Golden Hour.

And do not underestimate venous bleeding. Just because it is not spurting does not mean it is harmless, especially if it is from a large vein or in a location that is difficult to control.

Finally, remember your priorities. Assess the wound, expose it fully, apply pressure, and escalate to a tourniquet if needed. The faster you act, the better the patient's outcome.

Slide 18: Questions

Before we wrap up, what questions do you have about identifying and managing life-threatening bleeding?

Sometimes it is not as obvious as a spurting artery. Sometimes it is about the patient's presentation, or the scene itself giving you that gut feeling that something's wrong.

Have any of you encountered a bleeding scenario that made you stop and think? Whether it is about tourniquet use, recognizing signs of shock, or knowing when to escalate, now is the time to ask.

Slide 19: Student Participation

Before we wrap up today, you will take a short post-test to check your understanding of the material we just covered. Do not worry. This is just to reinforce key takeaways and help you feel more confident identifying life-threatening bleeding.

After the test, we will work through a few real-world scenarios as a group. You will get a chance to think critically about what you would do in each situation. This is a great time to ask questions and apply what you have learned in a low-pressure environment.

Next time, we will introduce the Trauma Injury Simulator and begin hands-on practice with direct pressure and tourniquet application. Today's focus is on recognition and decision making, skills you will build on during the next lesson.

Lesson One – Identifying Life-Threatening Bleeding

REVIEW: Practice Identifying Life-Threatening Bleeding

20 minutes

Purpose:

Encourages critical thinking and reinforce rapid recognition of severe bleeding.

Materials:

- *Lesson 1* slide presentation (for review)
- *Identifying Life-Threatening Bleeding Scenarios* worksheet
- *Identifying Life-Threatening Bleeding Scenarios* – Answer Key
- *Identifying Life-Threatening Bleeding Test*
- *Identifying Life-Threatening Bleeding Test* – Answer Key

Facilitation Steps:

1. Starting with Slide 4, review the different types of bleeding (arterial, venous, and capillary) with the students.
2. After discussing each type, have participants begin working on the *Identifying Life-Threatening Bleeding: Scenarios* worksheet alone or in pairs. Students will read each scenario, identify the type of bleeding, determine if it is life-threatening, and explain the immediate actions they would take.
3. Show Slide 8 and review the key signs of life-threatening bleeding, reinforcing how to recognize critical situations quickly.
4. Allow students time to revisit their worksheet answers and make any adjustments based on this review.
5. Facilitate a group discussion in which students share their responses and reasoning for each scenario.
6. Show Slide 12 and discuss the importance of early intervention and quick decision making. Highlight how fast recognition leads to fast treatment and emphasize proper bleeding control steps for each type of bleeding presented in the scenarios. Encourage students to reflect on which scenarios felt the most challenging and why.
7. Once students have completed their worksheet and participated in the discussion, instruct them to complete the post-test.
8. Review the correct answers as a group and allow students to self-check their work using the answer key provided.

Name: _____

Class: _____

Identifying Life-Threatening Bleeding Scenarios

Scenario 1: Arm Laceration

An eight-year-old female ran through a sliding glass window while being chased by her brother. She has a large laceration on her inner arm, with bright red blood spurting from the wound.

What type of bleeding is this?

Is this life-threatening?

What should be done immediately?

Scenario 2: Skateboarding Elbow Injury

A 15-year-old male fell onto the pavement while skateboarding at a local skate park. Moderate bleeding is coming from his right elbow. There is slow oozing of blood from his elbow, and he has no other injuries.

What type of bleeding is this?

Is this life-threatening?

What is your next step?

Scenario 3: Construction Site Injury

A 47-year-old male is hit on the forearm by a falling metal pipe. There is a large, open wound with steady, dark red bleeding. He is alert and applying pressure to his wound, which appears to be controlled.

What type of bleeding is this?

Is this life-threatening?

What would you do if the bleeding did not stop?

Scenario 4: Motorcycle Crash

A 26-year-old male involved in a motorcycle crash has a large open wound on his lower leg. Bright red blood is squirting with each heartbeat. He is pale, breathing fast, and dizzy.

What type of bleeding is this?

Is this life-threatening?

What signs of shock do you recognize?

Scenario 5: Elderly Fall at Home

An 82-year-old female tripped over her cat and hit her head on her coffee table. She has a minor scalp laceration that is bleeding heavily but not spurting. She is confused and on blood thinners.

What type of bleeding is this?

Could this become life-threatening?

What special considerations apply here?

Identifying Life-Threatening Bleeding Scenarios – Answer Key

Scenario 1: Arm Laceration

An eight-year-old female ran through a sliding glass window while being chased by her brother. She has a large laceration on her inner arm, with bright red blood spurting from the wound.

What type of bleeding is this?

Arterial bleeding because bright red blood is spurting from the wound.

Is this life-threatening?

Yes.

What should be done immediately?

Call 911, use standard precautions, apply direct pressure, and apply a tourniquet if the bleeding does not stop.

Scenario 2: Skateboarding Elbow Injury

A 15-year-old male fell onto the pavement while skateboarding at a local skate park. Moderate bleeding is coming from his right elbow. There is slow oozing of blood from his elbow, and he has no other injuries.

What type of bleeding is this?

Capillary because it is minor and has slow oozing blood.

Is this life-threatening?

No.

What is your next step?

Use standard precautions, clean the wound, and apply a bandage if needed.

Scenario 3: Construction Site Injury

A 47-year-old male is hit on the forearm by a falling metal pipe. There is a large, open wound with steady, dark red bleeding. He is alert and applying pressure to his wound, which appears to be controlled.

What type of bleeding is this?

Venous bleeding.

Is this life-threatening?

It could be if the bleeding was not controlled.

What would you do if the bleeding did not stop?

Call 911, use standard precautions, and apply a tourniquet.

Scenario 4: Motorcycle Crash

A 26-year-old male involved in a motorcycle crash has a large open wound on his lower leg. Bright red blood is squirting with each heartbeat. He is cool, pale, breathing fast, and dizzy.

What type of bleeding is this?

Arterial bleeding.

Is this life-threatening?

Yes.

What signs of shock do you recognize?

Cool, pale skin, breathing fast, and dizziness.

Scenario 5: Elderly Fall at Home

An 82-year-old female tripped over her cat and hit her head on her coffee table. She has a minor scalp laceration that's bleeding heavily but not spurting. She is confused and on blood thinners.

What type of bleeding is this?

This is venous bleeding (and possibly some capillary bleeding). Even though the bleeding is heavy, because scalp wounds tend to bleed a lot, it is not spurting. This tells us it is not arterial. The fact that she's on blood thinners can make even minor venous or capillary bleeding appear more severe and harder to control.

Could this become life-threatening?

It could be if the bleeding is not controlled. The patient could also have internal bleeding, which can become life-threatening if not diagnosed and treated.

What special considerations apply here?

Because of her age, confusion, and blood thinner use, this case should be treated with heightened caution. Even if the bleeding appears controlled, she should be evaluated by medical professionals immediately to rule out serious head injury or internal bleeding.

Identifying Life-Threatening Bleeding Test – Answer Key

Instructions: Select the best answer to the multiple-choice questions below.

1. Which of the following is considered a sign of life-threatening bleeding?
 - a. Bruising on the arm
 - b. A slow oozing scrape
 - c. Blood soaking through bandages rapidly**
 - d. A nosebleed

2. Arterial bleeding is dangerous because it:
 - a. Usually stops on its own
 - b. Can be treated with ice packs
 - c. Spurts bright red blood and is hard to control**
 - d. Is less severe than capillary bleeding

3. Which describes the “Golden Hour”?
 - a. The first 60 minutes after a traumatic injury**
 - b. The last 60 minutes after a severe injury
 - c. The time it takes to get a trauma patient to the hospital
 - d. The time it takes to achieve severe blood loss

4. What is a common sign of shock from blood loss?
 - a. High blood pressure
 - b. Pink, warm skin
 - c. Restlessness and confusion**
 - d. Nausea after eating

5. When should you apply a tourniquet?
 - a. For minor scrapes or capillary bleeding
 - b. When direct pressure does not stop life-threatening bleeding**
 - c. After placing an ice pack on the injury
 - d. Only if the person asks for it

Sources

1. Blake, Kati (2019, September 18). *What You Need to Know About Hemorrhage*. Retrieved from <https://www.healthline.com/health/bleeding>
2. Mayo Clinic Website (2024). *Shock: First aid*. Retrieved from <https://www.mayoclinic.org/first-aid/first-aid-shock/basics/art-20056620>
3. American Red Cross Website (2025). *Bleeding, Life-Threatening External*. Retrieved from <https://www.redcross.org/take-a-class/resources/learn-first-aid/bleeding-life-threatening-external>
4. Cleveland Clinic Website (2024, April 24). *Hemorrhage*. Retrieved from <https://my.clevelandclinic.org/health/diseases/hemorrhage>

Lesson Two – Proper Tourniquet Placement and Application

Lesson Overview

In this lesson, students will learn when and how to properly apply a tourniquet to control severe bleeding. They will understand the correct placement, tightening, and safety considerations for tourniquet use, including how to check for a distal pulse and document the time of application. Students will also learn the importance of keeping the tourniquet visible so medical professionals can immediately identify it. Hands-on practice with the Trauma Injury Simulator will reinforce correct application techniques.

Lesson Objectives

After completing this lesson, participants will be able to:

- Recognize when a tourniquet is needed
- Understand proper placement
- Practice the correct application and tightening
- Avoid common mistakes seen with tourniquet use

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• <i>Proper Tourniquet Placement and Application</i> worksheet • <i>Proper Tourniquet Placement and Application – Answer Key</i> • <i>Proper Tourniquet Placement and Application Test</i>	1. Print/photocopy the <i>Proper Tourniquet Placement and Application</i> worksheet (one per participant). 2. Print/photocopy the <i>Proper Tourniquet Placement and Application Test</i> (two per participant). 3. Access the worksheet answer key.	10 minutes
LEARN	• <i>Lesson 2</i> slide presentation	1. Prepare the <i>Lesson 2</i> slide presentation for viewing.	15 minutes
REVIEW	• <i>Lesson 2</i> slide presentation (for review) • <i>Proper Tourniquet Placement and Application Test</i> • <i>Proper Tourniquet Placement and Application Test – Answer Key</i> • Trauma Injury Simulator	1. Access the answer key. 2. Have the Trauma Injury Simulator ready for student activities.	20 minutes

Instructor Note: Focus activities may also be completed prior to class.

Lesson Two – Proper Tourniquet Placement and Application

FOCUS: Developing Critical Thinking and Decision-Making Skills

10 minutes

Purpose:

Help students develop critical thinking and decision-making skills.

Materials:

- *Proper Tourniquet Placement and Application* worksheet
- *Proper Tourniquet Placement and Application* worksheet – Answer Key
- *Proper Tourniquet Placement and Application* Test
- *Proper Tourniquet Placement and Application* Test – Answer Key

Facilitation Steps:

1. Distribute the *Proper Tourniquet Placement and Application* worksheets before or at the beginning of class and have the answer key available.
2. Distribute two copies of the *Proper Tourniquet Placement and Application* Test and explain to the students that, upon your instruction, one is to be taken at the start of class and one at the end.
3. Have students read the information and complete the worksheet and pre-test. Information from the pre-test can be compared with information from the post-test, which participants will take upon completion of the lesson to measure changes in their knowledge.
4. Have students pair up after completion and share answers from the worksheet.

Proper Tourniquet Placement and Application

Purpose: Develop critical thinking and decision-making skills

READ the following:

You are hiking with a group of friends from college when one of your friends, Violet, slips on a steep trail and falls onto a sharp rock. Violet has a deep cut on her upper leg, and you immediately notice bright red blood spurting from the wound. Her shorts quickly become soaked with blood, and she looks pale and says she feels dizzy. You and your friends try to apply a bandage and use direct pressure, but the bleeding does not stop.

Luckily, someone in your group has a first aid kit with a commercial tourniquet. Acting fast, you cut away Violet's shorts to fully expose the wound and apply the tourniquet as high as possible on her thigh, near the groin. You tighten it until the bleeding completely stops and secure the windlass in place. You also write down the time the tourniquet was applied. Once the bleeding is under control, you call 911 and stay with Violet until help arrives.

REFLECT on the situation:

What emotions do you think Violet was feeling?

How do you think you would feel in this situation?

Where did you apply the tourniquet, and why?

How would you know the tourniquet is working properly?

Why is it important to write down the time the tourniquet was applied?

SHARE your thoughts with a peer when it's discussion time.

Proper Tourniquet Placement and Application – Answer Key

Purpose: Develop critical thinking and decision-making skills

READ the following:

You are hiking with a group of friends from college when one of your friends, Violet, slips on a steep trail and falls onto a sharp rock. Violet has a deep cut on her upper leg, and you immediately notice bright red blood spurting from the wound. Her shorts quickly become soaked with blood, and she looks pale and says she feels dizzy. You and your friends try to apply a bandage and use direct pressure, but the bleeding does not stop.

Luckily, someone in your group has a first aid kit with a commercial tourniquet. Acting fast, you cut away Violet's shorts to fully expose the wound and apply the tourniquet as high as possible on her thigh, near the groin. You tighten it until the bleeding completely stops and secure the windlass in place. You also write down the time the tourniquet was applied. Once the bleeding is under control, you call 911 and stay with Violet until help arrives.

REFLECT on the situation:

What emotions do you think Violet was feeling?

I think Violet was feeling scared, in pain, and worried about how serious the injury was. She probably felt some relief when the bleeding finally stopped.

How do you think you would feel in this situation?

I would feel nervous and pressured to act quickly but also focused and determined to help my friend and keep her safe.

Where did you apply the tourniquet, and why?

I applied the tourniquet as high as possible on Violet's thigh, near the groin, because the wound was high up on her leg. Placing the tourniquet high ensures that blood flow is completely stopped above the injury.

How would you know the tourniquet is working properly?

I would know it is working because the bleeding completely stops, and I would not be able to feel a pulse below the tourniquet. Violet would also probably say it is very tight and painful, which is a sign it is applied correctly.

Why is it important to write down the time the tourniquet was applied?

It is important to record the time so that EMS and hospital staff know how long the tourniquet has been on. This helps guide their next steps in treatment safely.

SHARE your thoughts with a peer when it's discussion time.

Name: _____

Class: _____

Proper Tourniquet Placement and Application Test

Instructions: Select the best answer to the multiple-choice questions below.

1. Where should a tourniquet be placed on a limb?
 - a. Directly over the bleeding site
 - b. 2-3 inches above the bleeding site
 - c. Around the wrist or ankle
 - d. At the nearest joint above the injury
2. What is the main purpose of a tourniquet?
 - a. To slow down minor bleeding
 - b. To stop life-threatening bleeding from an arm or leg
 - c. To prevent infection in a wound
 - d. To help the patient feel more comfortable
3. After applying a tourniquet, what should you do next?
 - a. Cover it with a blanket to keep the patient warm
 - b. Remove it after 5 minutes to check the wound
 - c. Leave it visible and check for a pulse below the tourniquet
 - d. Loosen it every 10 minutes to restore circulation
4. Which type of bleeding is most likely to need a tourniquet?
 - a. Nosebleed
 - b. Minor cut on the hand
 - c. Deep laceration with heavy bleeding from the thigh
 - d. Small scrape (abrasion) on the knee
5. Why should a tourniquet never be covered by clothing or blankets?
 - a. It might get too tight if covered
 - b. It helps stop the bleeding faster if left uncovered
 - c. So medical professionals can clearly see it and know a tourniquet is in place
 - d. Covering it could cause the tourniquet to fall off

Lesson Two – Proper Tourniquet Placement and Application

LEARN: Proper Tourniquet Placement and Application Slide Presentation

15 minutes

Purpose:

Participants will learn to assess limb injuries quickly, ensure the tourniquet is applied effectively, and understand key steps to prioritize patient care in cases of life-threatening hemorrhage.

Materials:

- Lesson 2 slide presentation
- Trauma Injury Simulator

Facilitation Steps:

Share the following information as you show the slide presentation.

Slide 1: Proper Tourniquet Placement and Application

Welcome to Lesson 2! Today's focus is hands-on and practical. You are going to learn exactly how to apply a tourniquet to control serious bleeding, what we also call a hemorrhage. By the end of the lesson, you will feel confident knowing what to do when seconds count.

Slide 2: Objectives

Our goal today is simple: learn when and how to use a tourniquet properly. We will walk through the steps and practice the correct application and tightening, learning how to avoid common mistakes.

Slide 3: What Is a Tourniquet?

A tourniquet is a medical tool that is wrapped around a limb to stop a hemorrhage (serious, life-threatening bleeding). It works by completely blocking blood flow above the injury. It is only used on arms and legs, not on the neck or torso.

Slide 4: Hemorrhage

Hemorrhage is the medical term for damage to a blood vessel. A hemorrhage can be external, where you see blood coming out of the body, like a deep gash on the leg. It can also be internal, where bleeding happens inside the body. For example, when someone has internal injuries from a car crash and there is no visible wound.

Why is this important? Because hemorrhaging is one of the top reasons people die from traumatic injuries. That is why controlling bleeding fast is one of the first things we do in an emergency.

In today's lesson, we are focusing on external hemorrhage, the kind of serious bleeding you can see, where a tourniquet might be needed.

Slide 5: When to Use a Tourniquet

Okay, now let's talk about when to use a tourniquet. We do not apply one on every time we see blood. Tourniquets are reserved for serious cases, where the bleeding is so bad it could be deadly.

So, what are the signs? First, if you see blood spurting or pulsing out of a wound, especially from an arm or leg, that is a clue that it is probably an arterial bleed, meaning it is coming from a major blood vessel. This is a hemorrhage that will not stop on its own.

Second, if you have tried to control the bleeding using direct pressure, meaning you have pressed hard with a bandage or your gloved hands, and it is still bleeding, that is another sign that a tourniquet is needed.

Remember, tourniquets are only for bleeding from arms and legs. Never use them for head, neck, or chest wounds.

Slide 6: Expose and Assess

Before you apply a tourniquet, you need to know exactly what you are dealing with. That means you must expose the injury. In an emergency, do not waste time trying to peel clothes off gently. Use scissors, trauma shears (shown in the photo), or tear the clothing to get a clear view of the wound.

Look for clues. Is blood spurting? Is it a steady flow? Is it oozing? And how much blood is already on the ground or the patient's clothes?

Your job is to assess fast. Is this hemorrhage life-threatening? If it is, and it is on a limb, you know a tourniquet might be needed. This step is important. If you do not look at the wound properly, you could miss something serious, or you might waste time applying a tourniquet when it is not necessary.

Slide 7: Placement

Tourniquet placement is something you must get right. The rule of thumb is to place it about two to three inches above the wound, closer to the heart. Why? Because you want to completely block the blood flow before it reaches the injury.

Never, ever place a tourniquet over a joint, like the knee or elbow, because the bones make it impossible to get the tight, even pressure you need to stop the bleeding.

Tip: If you are not sure exactly where the wound is, such as if the patient's leg is mangled and hard to assess, go "high and tight." That means you put the tourniquet as high up on the limb as you can. For an arm injury, that means you would place the tourniquet up near the armpit. For a leg injury, the tourniquet would be placed near the groin. That way, you make sure you stop the bleeding no matter what.

Slide 8: Trauma Injury Simulator

Before we get deeper into exactly how to apply a tourniquet, I want to introduce you to a tool we will use soon: the Trauma Injury Simulator.

This simulator is a realistic medical trainer that lets you practice applying tourniquets on both an arm and a leg. It is designed to look and feel like a real person's limb, complete with a realistic bleeding wound. You'll have the chance to work through what we are learning today by placing and tightening a tourniquet on this simulator.

What is great about this simulator is that you can practice repeatedly until you feel completely confident. You will get immediate feedback and see for yourself how a properly applied tourniquet stops the bleeding.

We will use it in the next hands-on session. As we go through the steps today, keep in mind that you will soon have the chance to try it for yourself.

Slide 9: Applying the Tourniquet

Let's learn how to apply the tourniquet using the Trauma Injury Simulator. First, make sure the limb is fully exposed, no pants, sleeves, or anything in the way. Wrap the tourniquet all the way around the limb, making sure it is flat and not twisted. Position it in the right spot. Remember to secure the tourniquet two to three inches above the wound or high and tight if needed.

Start tightening the tourniquet. You should pull it as tight as you can before you even touch the windlass. The windlass is that stick or rod you twist to make it even tighter. Keep twisting until the bleeding completely stops. Remember, do not be shy; you must make it tight. This is a life-or-death situation. Just be sure to tell the patient that it will hurt.

After you have twisted the windlass until the bleeding stops, secure it in place so it does not loosen. Some tourniquets have a little hook or a clip that locks the windlass down.

Do a quick check. Look at the wound. Is the bleeding fully controlled? Feel for a pulse below the tourniquet. If there is still a pulse, it is not tight enough, and you must twist more. If you check for a pulse in an arm, you should check with two fingers, your index and middle fingers. You never want to use your thumb because it has its own pulse. You should check the radial pulse, which is noted on the wrist below the base of your thumb. Ensure you do not press too hard when feeling for pulses or you may stop the pulse.

When checking for a pulse in an injured leg, check the patient's pedal pulse. The pedal pulse is felt on top of their foot, right in the middle, between the ankle and the toes. Gently press down just to the side of the big toe tendon (the one that sticks out when they lift their big toe). Also, be sure to keep the tourniquet visible. Never cover the tourniquet with clothing or a blanket. It must stay visible, so other medical professionals know a tourniquet is in place.

One Last Important Note: Write down the time you applied the tourniquet. This helps hospital staff know how long it has been on. Leaving a tourniquet on too long can cause complications.

Slide 10: Common Mistakes to Avoid

Let's go over some of the common mistakes people make with tourniquets, so you can avoid them.

The first mistake is not tightening enough. People sometimes get nervous about causing pain. Remember, pain is not the priority, stopping the bleeding is. Once you have tightened it enough, leave it in place until a doctor removes it. You never want to loosen the tourniquet to see if the bleeding has stopped.

The second mistake is accidentally placing the tourniquet over a joint. We already talked about why that does not work.

The third mistake happens when you must improvise a tourniquet. People sometimes use something too narrow or stretchy, like a shoelace or thin cord. That is dangerous because it can cut into the skin and cause more harm than good. Always aim for something at least an inch wide if you are improvising. Do not worry, we will cover this more in-depth in another lesson.

Slide 11: Arm Injury Scenario

Let's apply what we have learned to a quick scenario. The patient is a 40-year-old male who was stabbed in the upper arm during an attempted carjacking. There is a deep cut to the inside of his bicep that is spurting bright red blood.

Imagine you arrive at this scene where the patient has a deep cut on their arm and blood is spurting out. What do we know? That is likely an arterial hemorrhage, which is life-threatening.

What is your first step? Call 911 or have someone do so while you take standard precautions, expose the wound, check the bleeding, apply direct pressure with a gloved hand or bandage, and get that tourniquet on as fast as possible if direct pressure does not control the bleeding. Remember to tighten it until the bleeding fully stops and no pulse is felt below the injury.

Where would you place the tourniquet? Two to three inches above the wound, or high and tight if you cannot tell exactly where it is. If placing on an arm, the tourniquet would sit up near the armpit.

Slide 12: Review: True or False

Let's evaluate your knowledge with a few true or false questions based on what we have covered today.

Tourniquets go over elbows and knees. That is **false**. Remember, we never place a tourniquet over a joint because it will not apply proper pressure to stop the bleeding.

A tourniquet should be loosened every 10 minutes. This is also **false**. Once a tourniquet is on, you do not loosen it. It stays tight until medical professionals can safely remove it.

Apply direct pressure before using a tourniquet. That is **true**. In most cases, we try direct pressure first, unless the bleeding is so severe that it is immediately life-threatening.

A tourniquet can only be used for arterial bleeding. That is **false**. While tourniquets are often used for arterial bleeding, they can also be used for severe venous bleeding when other methods fail.

A tight tourniquet hurts but saves lives. That is **true**. It will hurt, but that is a sign it is doing its job and stopping the hemorrhage.

Slide 13: Key Takeaways

Let's wrap up the key points from today's lesson.

- Tourniquets are only for arms and legs
- Place them about 2-3 inches above the wound, or high and tight if needed
- Tighten them until the bleeding stops completely and there is no pulse, no exceptions
- And never, ever remove or loosen a tourniquet once it is applied

Tourniquets are a simple tool, but they must be used correctly to save lives. The good news? Now you know exactly how to do it!

Slide 14: Student Participation

All right, to wrap up today's lesson, here is what is coming next.

First, you will take a short test on proper tourniquet application and placement. This is your chance to check your understanding of the key steps we have covered, like where to place a tourniquet, how tight it needs to be, and common mistakes to avoid. Do not stress. It is meant to reinforce what you have learned and boost your confidence.

After that, we are going to move into hands-on practice using the Trauma Injury Simulator. This is where you will put your knowledge into action. You will work on real-life scenarios, apply tourniquets, and see firsthand how these techniques work. It is a great way to build your skills and feel ready for real-world situations.

So, let's finish strong and get ready to practice what you have learned today!

Lesson Two – Proper Tourniquet Placement and Application

REVIEW: Practice Proper Tourniquet Placement and Application

20 minutes

Purpose:

Students will learn how to check for a distal pulse after applying the tourniquet and be reminded that a tourniquet must never be covered by clothing or blankets.

Materials:

- Lesson 2 slide presentation (for review)
- Trauma Injury Simulator
- *Proper Tourniquet Placement and Application Test*
- *Proper Tourniquet Placement and Application Test – Answer Key*

Facilitation Steps:

1. Starting with Slides 5-7, review the purpose of a tourniquet and when it should be used. Emphasize key points such as tourniquet placement (two to three inches above the wound), tightening until bleeding stops, and leaving it visible (never covering it with clothing or blankets).
2. Move to Slide 9. Review the proper steps for applying a tourniquet (including checking for a distal pulse after application). Explain why it is important to document the time of application and stress the dangers of improper use.
3. Facilitate a brief Q&A or discussion to clarify student understanding of the process.
4. Demonstrate proper tourniquet application using the Trauma Injury Simulator. Remind students that they cannot practice on each other because tourniquets can cause tissue damage and are for emergency use only.
5. Rotate small groups or individuals through the simulator so each student can practice or observe the application technique. Encourage students who are waiting for their turn to review key slides or observe closely to reinforce learning.
6. Once all students have had an opportunity to practice or observe with the simulator, instruct them to complete the post-test.
7. After the test is complete, review the correct answers as a group and allow students to self-check their work using the answer key provided.

Proper Tourniquet Placement and Application Test – Answer Key

Instructions: Select the best answer to the multiple-choice questions below.

1. Where should a tourniquet be placed on a limb?
 - a. Directly over the bleeding site
 - b. **2-3 inches above the bleeding site**
 - c. Around the wrist or ankle
 - d. At the nearest joint above the injury
2. What is the main purpose of a tourniquet?
 - a. To slow down minor bleeding
 - b. **To stop life-threatening bleeding from an arm or leg**
 - c. To prevent infection in a wound
 - d. To help the patient feel more comfortable
3. After applying a tourniquet, what should you do next?
 - a. Cover it with a blanket to keep the patient warm
 - b. Remove it after 5 minutes to check the wound
 - c. **Leave it visible and check for a pulse below the tourniquet**
 - d. Loosen it every 10 minutes to restore circulation
4. Which type of bleeding is most likely to need a tourniquet?
 - a. Nosebleed
 - b. Minor cut on the hand
 - c. **Deep laceration with heavy bleeding from the thigh**
 - d. Small scrape (abrasion) on the knee
5. Why should a tourniquet never be covered by clothing or blankets?
 - a. It might get too tight if covered
 - b. It helps stop the bleeding faster if left uncovered
 - c. **So medical professionals can clearly see it and know a tourniquet is in place**
 - d. Covering it could cause the tourniquet to fall off

Sources

1. Red Cross Website (2024, November 27). *How to Apply a Tourniquet*. Retrieved from <https://www.redcross.org/take-a-class/resources/articles/how-to-apply-a-tourniquet>
2. Van Der Walt, Nick (2025, April 17). *Tourniquet Use In First Aid: When, Why, And How To Do It Right*. Retrieved from <https://accesspd.co.za/blog/tourniquet-use-in-first-aid-when-why-and-how-to-do-it-right>
3. Cleveland Clinic Website (2024, April 24). *Hemorrhage*. Retrieved from <https://my.clevelandclinic.org/health/diseases/hemorrhage>

Lesson Three – Understanding the “Why” of Tourniquet Use

Lesson Overview

In this lesson, students will learn why tourniquets are effective in stopping life-threatening bleeding. They will explore what happens inside the body during severe hemorrhage and understand how a tourniquet works to block blood flow and prevent shock. The lesson will also cover the risks, benefits, and common myths about tourniquet use. Through case studies and hands-on activities, students will build confidence in knowing when a tourniquet is necessary and why quick action is critical to save lives.

Lesson Objectives

After completing this lesson, participants will be able to:

- Understand what happens during severe bleeding (hemorrhage)
- Understand how tourniquets control bleeding
- Recognize the risks and benefits of tourniquet use
- Be confident in making the decision to apply a tourniquet

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• <i>Understanding the “Why” of Tourniquet Use</i> worksheet • <i>Understanding the “Why” of Tourniquet Use – Answer Key</i> • <i>Understanding the “Why” of Tourniquet Use Test</i>	1. Print/photocopy the <i>Understanding the “Why” of Tourniquet Use</i> worksheet (one per participant). 2. Print/photocopy the <i>Understanding the “Why” of Tourniquet Use Test</i> (two per participant). 3. Access the worksheet answer key.	10 minutes
LEARN	• <i>Lesson 3</i> slide presentation	1. Prepare the <i>Lesson 3</i> slide presentation for viewing.	15 minutes
REVIEW	• <i>Lesson 3</i> slide presentation (for review) • <i>Understanding the “Why” of Tourniquet Use Test</i> • <i>Understanding the “Why” of Tourniquet Use Test – Answer Key</i> • Trauma Injury Simulator • <i>Trauma Injury Simulator</i> worksheet • <i>Case Studies</i> worksheet • <i>Case Studies – Answer Key</i>	1. Access the answer keys. 2. Have the Trauma Injury Simulator ready for student activities. 3. Print/photocopy the <i>Trauma Injury Simulator</i> and <i>Case Studies</i> worksheets (one of each per participant).	20 minutes

Instructor Note: Focus activities may also be completed prior to class.

Lesson Three – Understanding the “Why” of Tourniquet Use

FOCUS: Developing Critical Thinking and Decision-Making Skills

10 minutes

Purpose:

Help students develop critical thinking and decision-making skills.

Materials:

- *Understanding the “Why” of Tourniquet Use* worksheet
- *Understanding the “Why” of Tourniquet Use – Answer Key*
- *Understanding the “Why” of Tourniquet Use Test*

Facilitation Steps:

1. Distribute the *Understanding the “Why” of Tourniquet Use* worksheets before or at the beginning of class and have the answer key available.
2. Distribute two copies of the *Understanding the “Why” of Tourniquet Use Test* and explain to the students that, upon your instruction, one is to be taken at the start of class and one at the end.
3. Have students read the information and complete the worksheet and pre-test. Information from the pre-test can be compared with information from the post-test, which participants will take upon completion of the lesson to measure changes in their knowledge.
4. Have students pair up after completing the worksheet and test to share answers from the worksheet.

Understanding the “Why” of Tourniquet Use

Purpose: Develop critical thinking and decision-making skills

READ the following:

You are on a weekend camping trip with your friend Xaden and a group of classmates. While gathering firewood near a rocky slope, Xaden trips and falls, landing on a jagged piece of metal debris hidden in the brush. He has a deep laceration to his upper arm below his bicep, and you immediately see bright red blood spurting from the wound.

Xaden looks panicked, breathes fast, and tells you he feels lightheaded. You and another friend quickly press a bandage on the wound and apply firm, direct pressure, but the bleeding does not stop. One of your classmates grabs a first aid kit with a commercial tourniquet. You expose the injury and apply the tourniquet about three inches above the wound, high up into his armpit.

You tighten the tourniquet until the bleeding stops completely and secure the windlass. You check that there is no radial pulse below the tourniquet and write down the application time. While calming Xaden down and monitoring him closely, you instruct a classmate to call 911 for help and wait for EMS to arrive.

REFLECT on the situation:

What were you thinking and feeling during this emergency?

Why did you decide to apply a tourniquet in this situation?

What is happening inside Xaden’s body that makes the tourniquet work?

Why is speed so important when applying a tourniquet in this type of emergency?

SHARE your thoughts with a peer when it is discussion time.

Understanding the “Why” of Tourniquet Use – Answer Key

Purpose: Develop critical thinking and decision-making skills

READ the following:

You are on a weekend camping trip with your friend Xaden and a group of classmates. While gathering firewood near a rocky slope, Xaden trips and falls, landing on a jagged piece of metal debris hidden in the brush. He has a deep laceration to his upper arm below his bicep, and you immediately see bright red blood spurting from the wound.

Xaden looks panicked, breathes fast, and tells you he feels lightheaded. You and another friend quickly press a bandage on the wound and apply firm, direct pressure, but the bleeding does not stop. One of your classmates grabs a first aid kit with a commercial tourniquet. You expose the injury and apply the tourniquet about three inches above the wound, high up into his armpit.

You tighten the tourniquet until the bleeding stops completely and secure the windlass. You check that there is no radial pulse below the tourniquet and write down the application time. While calming Xaden down and monitoring him closely, you instruct a classmate to call 911 for help and wait for EMS to arrive.

REFLECT on the situation:

What were you thinking and feeling during this emergency?

I felt a lot of pressure to act fast, but I also focused on what I had learned to stay calm and make good decisions. I knew every second counted to stop the bleeding.

Why did you decide to apply a tourniquet in this situation?

I decided to apply the tourniquet because Xaden’s bleeding was life-threatening. It was spurting bright red blood and did not stop with direct pressure. I knew a tourniquet was needed right away to save his life.

What is happening inside Xaden’s body that makes the tourniquet work?

The tourniquet completely squeezes the blood vessels shut, blocking blood flow to the injury. This stops the hemorrhage and prevents Xaden from going into shock or bleeding to death.

Why is speed so important when applying a tourniquet in this type of emergency?

Speed is important because arterial bleeding can be fatal within minutes. The faster I applied the tourniquet, the better Xaden’s chances of surviving and staying stable until medical help arrived.

Name: _____

Class: _____

Understanding the “Why” of Tourniquet Use Test

Instructions: Select the best answer to the multiple-choice questions below.

1. What is the main reason a tourniquet is used in an emergency?
 - a. To keep the patient calm
 - b. To stop life-threatening bleeding (hemorrhage)
 - c. To prevent infection
 - d. To reduce swelling
2. How does a tourniquet stop bleeding?
 - a. It cools down the blood
 - b. It slows the heart rate
 - c. It squeezes the blood vessels to block blood flow
 - d. It helps blood clot faster
3. What is the biggest risk of leaving a tourniquet on for too long?
 - a. Headache
 - b. Nerve and tissue damage
 - c. Low blood sugar
 - d. Trouble breathing
4. What should you do after applying a tourniquet?
 - a. Loosen it every 10 minutes
 - b. Remove it when the bleeding stops
 - c. Write down the time it was applied
 - d. Massage the limb below the tourniquet
5. Which of the following is a common myth about tourniquets?
 - a. They can save lives in emergencies
 - b. You should never cover them with a blanket
 - c. They always cause amputation
 - d. They should be applied 2-3 inches above the wound

Lesson Three – Understanding the “Why” of Tourniquet Use

LEARN: Slide Presentation

15 minutes

Purpose:

Participants will gain a clear understanding of why tourniquets are effective in stopping life-threatening bleeding.

Materials:

- Lesson 3 slide presentation

Facilitation Steps:

Share the following information as you show the slide presentation.

Slide 1: Understanding the “Why” of Tourniquet Use

Welcome back! In today’s lesson, we are going deeper to understand why tourniquets work. You have learned when and how to use them. Now, we will look at what is really happening inside the body when a tourniquet is applied and why it can save lives.

Slide 2: Objectives

By the end of this lesson, you will be able to explain exactly what happens when someone has a severe hemorrhage, how a tourniquet works to stop it, why using a tourniquet is worth the risks in life-threatening situations, and have the confidence to make the decision to apply one.

Slide 3: What Happens During Severe Bleeding?

When someone has a severe hemorrhage, meaning major bleeding, their body starts losing blood very quickly. Blood is not just liquid. It is how oxygen travels to all the vital organs like the brain, heart, and kidneys.

As blood volume drops, the body’s ability to circulate oxygen gets worse. That is when blood pressure starts to fall, and the person begins to go into hypovolemic shock. This is a dangerous state where the body starts to shut down because it is not getting enough oxygen to keep everything working.

If we do not stop the bleeding fast, the person can die in just a few minutes. That is why recognizing a hemorrhage and knowing how to act quickly, whether it is direct pressure or applying a tourniquet, can save lives.

Slide 4: The Body’s Natural Response to Bleeding

Let’s talk about what the body does when there is bleeding. The moment a blood vessel is damaged, your body tries to protect itself in two main ways. First, the vessels shrink down, this is called constriction, to reduce blood loss. Then, your blood’s clotting factors try to seal the wound and stop the bleeding naturally.

That is why, for small cuts or scrapes, you might see bleeding stop on its own after a few minutes. Your body is doing its job! But, in a life-threatening hemorrhage, these natural responses are just not enough. The bleeding is too strong and too fast. Your body cannot keep up. That is where we come in with tools like the tourniquet.

Slide 5: How a Tourniquet Works

A tourniquet wraps tightly around a limb and applies enough pressure to completely squeeze the blood vessels shut. It stops blood from flowing past the point where it is applied.

Think of it like turning off a faucet. If the faucet keeps running, water will keep spilling out. If you shut the faucet off at the source, you stop the flow. That is exactly what we do with a tourniquet. We shut off the blood supply to everything below the tourniquet.

This is important because, by stopping the bleeding, we buy the patient time. It keeps them alive long enough to get to the hospital, where surgeons can work to repair the damage.

Slide 6: Why Speed Matters

This is where things get serious. If someone is bleeding from an artery, like in their arm or leg, they can lose a life-threatening amount of blood in just three to five minutes.

The faster we apply a tourniquet, the better the patient's chances of survival. Even waiting just a few extra minutes can mean the difference between life and death. That is why we always emphasize acting quickly and decisively when we see signs of a hemorrhage that is out of control.

We are not just trying to help; we are racing against the clock to save a life.

Slide 7: Risks of Using a Tourniquet

It is important to be honest about the risks, too. Tourniquets are a powerful tool, but they come with some potential downsides. First, they can cause a lot of pain because they cut off blood flow completely and nerves are extremely sensitive to that.

If a tourniquet stays on for too long, typically over two hours, there is a risk of nerve injury or tissue damage. That is why we always document the time of application and make sure medical professionals know how long it has been in place.

The point is, when you are dealing with a life-threatening bleed, the priority is saving the person's life. We can fix tissue damage later, but we cannot bring someone back if they bleed out.

Slide 8: Tourniquet Myths

Let's bust some common myths about tourniquets. You will hear these myths from people who are not trained in tourniquet application.

First, the idea that tourniquets always lead to amputation. That is false. In fact, modern medical studies show that when tourniquets are applied correctly and managed well, they rarely result in amputation.

Second, some people think you should loosen a tourniquet every so often to let blood flow back

into the limb. No! Once the tourniquet is on, it stays on until hospital staff can manage it safely.

Finally, there is a myth that only doctors or paramedics can apply tourniquets. Anyone who is trained, including you, has the power and responsibility to act when it is needed.

Slide 9: When Tourniquets Save Lives

Think about situations like car crashes, factory or warehouse accidents, or even large-scale emergencies such as an earthquake or active shooter event.

In all these cases, people can suffer severe limb injuries where bleeding gets out of control fast. Having a tourniquet, and knowing how to use it properly, can make the difference between someone surviving or dying before help arrives.

Tourniquets are a critical tool in the world of trauma care, and they are especially important in remote or chaotic environments where help might be delayed.

Slide 10: Golden Hour Revisited

Let's quickly revisit the Golden Hour, that first 60 minutes after a traumatic injury. We talked about this earlier, but it is worth repeating. The faster we can control bleeding during that hour, the better the patient's chance of survival.

Tourniquets are one of the fastest, most effective ways to stop life-threatening bleeding. By applying one quickly and correctly, you give your patient their best shot at making it to definitive care in time.

Slide 11: Workplace Injury Case Study

Here is a real-world example to bring it all together. A factory worker's arm gets crushed by a piece of heavy machinery. There is massive bleeding and coworkers try direct pressure. However, it is not enough.

Emergency responders arrive and quickly apply a tourniquet above the injury. The bleeding stops, and the patient is transported to the hospital for surgery.

Key Takeaway: Without that tourniquet, the worker would not have survived long enough to get to surgery. This shows just how critical it is to act fast and use the tools we have learned.

Slide 12: You Make the Call

Now it is your turn to think like a first responder. Imagine you arrive at the scene of a motorcycle crash. The rider has a deep gash on their thigh with bright red, spurting blood. You apply direct pressure, but it is not working.

Would you apply a tourniquet here? What is your reasoning?

Think about what we have learned. What type of bleeding is this? What are your priorities? Be ready to explain why you would make the call to use a tourniquet.

Slide 13: Review: Why Tourniquets Matter

Let's quickly review the key points from today's lesson:

- Tourniquets stop deadly bleeding fast
- They give patients time to survive until they reach advanced care
- When used correctly, they are safe and highly effective

Tourniquets have been proven to save lives in countless real-world emergencies. By understanding the “why” behind their use, you will feel even more confident when the time comes to act.

Slide 14: Questions?

Awesome work today, everyone. Do you have any questions about how tourniquets work or why we use them the way we do?

In the next lesson, we will look at the different types of tourniquet equipment, how they work, and how to choose the right one for the situation.

Slide 15: Student Participation

Before we conclude this lesson, here is what we will do next.

First, you will take a short test that focuses on the “why” of tourniquet use. This will help you check your understanding of everything we covered today, like how tourniquets work, why they are effective, and when the risks are worth it.

After the test, we will begin some student activities that let you apply your critical thinking. These include working through case studies and group discussions in which you can really think about the reasons for using a tourniquet in different scenarios. We will also rotate groups through the Trauma Injury Simulator so everyone will get a chance to have some hands-on time applying tourniquets.

Both the test and the activities are designed to help you feel confident about the science and reasoning behind tourniquet use, so you are ready for the next lesson, where we will explore different types of tourniquet equipment.

Lesson Three – Understanding the “Why” of Tourniquet Use

REVIEW: Practice Applying a Tourniquet to Understand “Why” It Works

20 minutes

Purpose:

Participants will use the Trauma Injury Simulator to observe and understand exactly why a tourniquet effectively stops severe bleeding.

Materials:

- *Lesson 3* slide presentation (for review)
- Trauma Injury Simulator
- *Understanding the “Why” of Tourniquet Use Test*
- *Understanding the “Why” of Tourniquet Use Test – Answer Key*
- *Trauma Injury Simulator* worksheet
- *Case Studies* worksheet
- *Case Studies – Answer Key*

Facilitation Steps:

1. Starting with Slide 5, review how a tourniquet works and why it should be used. Emphasize key points such as tourniquet placement (two to three inches above the wound), tightening until bleeding stops, and leaving it visible (never covering it with clothing or blankets).
2. Review the proper steps (as learned in previous lessons) for applying a tourniquet, including checking for a distal pulse after application. Explain why it is important to document the time of application and stress the dangers of improper use.
3. Facilitate a brief Q&A or discussion to clarify student understanding of the process.
4. Demonstrate proper tourniquet application using the Trauma Injury Simulator. Remind students they cannot practice on each other because tourniquets can cause tissue damage and are for emergency use only.
5. Rotate small groups through the simulator so each student can practice or observe the application technique. Use a short scenario that involves life-threatening bleeding to describe the urgency to act fast. For example, “You are called to help a hiker with a deep thigh wound that is spurting blood. You need to apply a tourniquet fast to save their life.”
6. Once a group has completed using the simulator, have them answer the questions on the *Trauma Injury Simulator* worksheet.
7. Encourage students waiting for their turn to work on the *Case Studies* worksheet, either alone or in small groups. If there is not enough time to complete these in class, they can be assigned as homework.
8. Once all students have had an opportunity to practice or observe with the simulator and have completed their case studies, instruct them to take the post-test.
9. After taking the test, review the correct answers as a group and allow students to self-check their work using the answer key provided.

10. Review the case studies and discuss as a class what students observed and learned. If case studies were not completed during the activity, you can skip this part.

Name: _____ Class: _____

Trauma Injury Simulator

Instructions: Work with your group to apply a tourniquet using the Trauma Injury Simulator. Follow the scenario your instructor gives you. After applying the tourniquet, answer the questions below.

1. Did your tourniquet stop the bleeding on the first try? (Yes / No)

2. If not, what did you need to fix?

3. What did you notice about the difference between correct and incorrect placement or tightening?

Key Lessons Learned:

Write 2 important things you learned about why proper tourniquet use is critical:

1. _____

2. _____

Name: _____

Class: _____

Case Studies

Instructions: Read each case study and answer the questions below.

Case Study 1: Farm Accident

A 45-year-old farmer's leg is caught in a piece of machinery, causing a deep wound to the upper thigh with bright red blood spurting with every heartbeat. Direct pressure is not controlling the bleeding.

Where should you apply the tourniquet? Why?

What is happening inside the body that makes the tourniquet work?

Why is it important to act fast in this situation?

Case Study 2: Car Crash

A driver is pulled from a wreck and has a severe lower arm injury. The bleeding is steady but not spurting, and it soaks through dressings quickly without direct pressure.

Would a tourniquet be the best option here? Why or why not?

What might happen if this bleeding is not controlled quickly?

What should you monitor after applying the tourniquet (if needed)?

Case Study 3: Mountain Biking Injury

A mountain bicyclist falls and slices their lower leg on a sharp rock. The wound is deep, and bleeding is moderate but continuous. The closest help is 45 minutes away.

What is your first action to control bleeding?

Would you use a tourniquet right away? Why or why not?

How would understanding the “why” of tourniquet use help you decide the best treatment?

Case Studies – Answer Key

Instructions: Read each case study and answer the questions below.

Case Study 1: Farm Accident

A 45-year-old farmer's leg is caught in a piece of machinery, causing a deep wound to the upper thigh with bright red blood spurting with every heartbeat. Direct pressure is not controlling the bleeding.

Where should you apply the tourniquet? Why?

Apply the tourniquet as high as possible on the thigh, near the groin, because the injury is on the upper leg and the bleeding is arterial (spurting). This indicates a life-threatening hemorrhage that direct pressure cannot control.

What is happening inside the body that makes the tourniquet work?

The tourniquet compresses the major blood vessels, stopping blood flow to the limb below. This prevents continued blood loss and helps prevent shock and death from blood loss.

Why is it important to act fast in this situation?

Arterial bleeding can lead to death in minutes due to rapid blood loss. Acting quickly with a tourniquet gives the patient the best chance of survival by stopping the hemorrhage and maintaining perfusion to vital organs.

Case Study 2: Car Crash

A driver is pulled from a wreck and has a severe lower arm injury. The bleeding is steady but not spurting, and it soaks through dressings quickly without direct pressure.

Would a tourniquet be the best option here? Why or why not?

Not necessarily. The bleeding is steady and not spurting, which may suggest venous bleeding. Direct pressure should still be attempted first. A tourniquet would only be used if pressure fails to control the bleeding.

What might happen if this bleeding is not controlled quickly?

The patient could still experience significant blood loss over time, leading to shock, even if the bleeding is slower than arterial. It may become life-threatening if not managed promptly. If direct pressure cannot control the bleeding, a tourniquet must be applied.

What should you monitor after applying the tourniquet (if needed)?

You should check that bleeding has completely stopped, confirm there is no distal pulse, and record the time the tourniquet was applied. Monitor the patient's mental status and signs of shock.

Case Study 3: Mountain Biking Injury

A mountain biker falls and slices their lower leg on a sharp rock. The wound is deep, and bleeding is moderate but continuous. The closest help is 45 minutes away.

What is your first action to control bleeding?

Apply direct pressure with a clean bandage or dressing. Always try this first unless the bleeding is clearly life-threatening.

Would a tourniquet be used right away here? Why or why not?

No, not right away. Since the bleeding is moderate and not spurting, direct pressure should be attempted first. A tourniquet would only be used if the bleeding cannot be controlled or if it worsens.

How would understanding the “why” of tourniquet use help you decide the best treatment?

Knowing that tourniquets are used to stop life-threatening arterial bleeding helps guide decision making. In this case, since bleeding is not severe enough to cause immediate shock, you should try more conservative methods (like direct pressure) before using a tourniquet.

Understanding the “Why” of Tourniquet Use Test – Answer Key

Instructions: Select the best answer to the multiple-choice questions below.

1. What is the main reason a tourniquet is used in an emergency?
 - a. To keep the patient calm
 - b. To stop life-threatening bleeding (hemorrhage)**
 - c. To prevent infection
 - d. To reduce swelling
2. How does a tourniquet stop bleeding?
 - a. It cools down the blood
 - b. It slows the heart rate
 - c. It squeezes the blood vessels to block blood flow**
 - d. It helps blood clot faster
3. What is the biggest risk of leaving a tourniquet on for too long?
 - a. Headache
 - b. Nerve and tissue damage**
 - c. Low blood sugar
 - d. Trouble breathing
4. What should you do after applying a tourniquet?
 - a. Loosen it every 10 minutes
 - b. Remove it when the bleeding stops
 - c. Write down the time it was applied**
 - d. Massage the limb below the tourniquet
5. Which of the following is a common myth about tourniquets?
 - a. They can save lives in emergencies
 - b. You should never cover them with a blanket
 - c. They always cause amputation**
 - d. They should be applied 2-3 inches above the wound

Sources

1. Safeguard Medical Website (2022, January 28). *6 Common Myths of Tourniquets DEBUNKED!*
Retrieved from <https://safeguardmedical.com/6-common-myths-of-tourniquets-debunked/>
2. Mayo Clinic Website (2022, May 7). *The Crucial Role of Tourniquets In Trauma Care*. Retrieved from <https://www.mayoclinic.org/medical-professionals/trauma/news/the-crucial-role-of-tourniquets-in-trauma-care/mac-20531726>
3. BNS Institute Website (2023, December 21). *The Mechanism and Significance of Blood Clotting*. Retrieved from <https://bns.institute/applied-sciences/blood-clotting-mechanism-significance/>

Lesson Four – Tourniquet Equipment and Variations

Lesson Overview

In this lesson, students will learn about the different types of tourniquets used in bleeding control. They will explore common commercial models, how they function, and the pros and cons of each. The lesson will also cover improvised tourniquets, including safe material and windlass options. Through discussion, hands-on practice, and simulator use, students will gain confidence in identifying, selecting, and evaluating tourniquet equipment for various emergency scenarios.

Lesson Objectives

After completing this lesson, participants will be able to:

- Identify different types of commercial and improvised tourniquets
- Understand the design and function of common models
- Recognize what makes a tourniquet effective
- Understand why tourniquet selection matters in an emergency

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• <i>Tourniquet Equipment and Variations</i> worksheet • <i>Tourniquet Equipment and Variations – Answer Key</i> • <i>Tourniquet Equipment and Variations Test</i>	1. Print/photocopy the <i>Tourniquet Equipment and Variations</i> worksheet (one per participant). 2. Print/photocopy the <i>Tourniquet Equipment and Variations Test</i> (two per participant). 4. Access the worksheet answer key	10 minutes
LEARN	• <i>Lesson 4</i> slide presentation	1. Prepare the <i>Lesson 4</i> slide presentation for viewing.	15 minutes
REVIEW	• <i>Lesson 4</i> slide presentation (for review) • <i>Tourniquet Equipment and Variations Test</i> • <i>Tourniquet Equipment and Variations Test – Answer Key</i> • Trauma Injury Simulator • <i>Student Activity</i> worksheet • <i>Scenarios</i> worksheet • <i>Scenarios – Answer Key</i> • A variety of materials and objects that could be used as an improvised tourniquet and windlass (including objects that are not advised, like a belt or shoelace)	1. Access the answer keys. 2. Have the Trauma Injury Simulator and tourniquet materials ready for student activities. 4. Print/photocopy the <i>Student Activity</i> and <i>Scenarios</i> worksheets (one of each per participant).	20 minutes

Instructor Note: Focus activities may also be completed prior to class.

Lesson Four – Tourniquet Equipment and Variations

FOCUS: Developing Critical Thinking and Decision-Making Skills

10 minutes

Purpose:

Help students develop critical thinking and decision-making skills.

Materials:

- *Tourniquet Equipment and Variations* worksheet
- *Tourniquet Equipment and Variations – Answer Key*
- *Tourniquet Equipment and Variations Test*

Facilitation Steps:

1. Distribute the *Tourniquet Equipment and Variations* worksheets before or at the beginning of class and have the answer key available.
2. Distribute two copies of the *Tourniquet Equipment and Variations Test* and explain to the students that, upon your instruction, one is to be taken at the start of class and one at the end.
3. Have students read the information and complete the worksheet and pre-test. Information from the pre-test can be compared with information from the post-test, which participants will take upon completion of the lesson, to measure changes in their knowledge.
4. Have students pair up after finishing the worksheet and test to share answers from the worksheet.

Tourniquet Equipment and Variations

Purpose: Develop critical thinking and decision-making skills

READ the following:

You are volunteering at a local community fun run when you hear a loud crash near the start line. A runner has tripped and fallen onto a broken metal bike rack, suffering a deep, open wound to the upper leg. You approach and see bright red blood spurting from the injury with every heartbeat. The runner is pale, breathing fast, and clearly in distress.

Someone nearby brings you a first aid kit that contains two tourniquets: a CAT tourniquet and a RATS tourniquet. Another volunteer is on the phone with 911 requesting an ambulance. You quickly assess the scene and the bleeding. After putting on gloves from the first aid kit, you expose the injury, instruct a bystander who offers to help to apply direct pressure, then choose the tourniquet you feel most confident using.

You notice that direct pressure does not seem to be controlling the bleeding and decide to apply a tourniquet. You apply it three inches above the injury near the patient's groin, tighten it until the bleeding completely stops, and secure the windlass. You check for a pedal pulse (absent), write down the time of application, and wait for EMS to arrive.

REFLECT on the situation:

What were you thinking and feeling during this emergency?

Which tourniquet would you choose and why?

What features helped you know the tourniquet was effective?

How did your knowledge of different tourniquet types help in this scenario?

Why is familiarity with your equipment so important in high-stress situations?

SHARE your thoughts with a peer when it is discussion time.

Tourniquet Equipment and Variations

– Answer Key

Purpose: Develop critical thinking and decision-making skills

READ the following:

You are volunteering at a local community fun run when you hear a loud crash near the start line. A runner has tripped and fallen onto a broken metal bike rack, suffering a deep, open wound to the upper leg. You approach and see bright red blood spurting from the injury with every heartbeat. The runner is pale, breathing fast, and clearly in distress.

Someone nearby brings you a first aid kit that contains two tourniquets: a CAT tourniquet and a RATS tourniquet. Another volunteer is on the phone with 911 requesting an ambulance. You quickly assess the scene and the bleeding. After putting on gloves from the first aid kit, you expose the injury, instruct a bystander who offers to help to apply direct pressure, then choose the tourniquet you feel most confident using.

You notice that direct pressure does not seem to be controlling the bleeding and decide to apply a tourniquet. You apply it three inches above the injury near the patient's groin, tighten it until the bleeding completely stops, and secure the windlass. You check for a pedal pulse (absent), write down the time of application, and wait for EMS to arrive.

REFLECT on the situation:

What were you thinking and feeling during this emergency?

I felt urgency and pressure to stop the bleeding quickly, but I also relied on what I had learned about choosing the correct tourniquet. I stayed focused on using my training to make the best decision for the patient.

Which tourniquet would you choose and why?

I would choose the CAT tourniquet because I have practiced with it before and feel confident using its windlass and strap system. It is wide, easy to control, and effective for severe bleeding.

What features helped you know the tourniquet was effective?

The bleeding completely stopped, and I could not feel a pulse below the tourniquet. It was secured tightly in place, and the windlass held firm, which told me it was applied correctly.

How did your knowledge of different tourniquet types help in this scenario?

Knowing the pros and cons of each tourniquet helped me quickly pick the one that was easiest to apply. I knew which one to trust in a real emergency and did not waste time guessing.

Why is familiarity with your equipment so important in high-stress situations?

When time matters, you do not want to learn how your tools work. You want to already know. Being familiar with how to use the tourniquet gave me the confidence to act fast and possibly saved a life.

SHARE your thoughts with a peer when it is discussion time.

Name: _____

Class: _____

Tourniquet Equipment and Variations Test

Instructions: Select the best answer to the multiple-choice questions below.

1. Which of the following features is essential for an effective tourniquet?
 - a. Stretchy material for flexibility
 - b. Narrow strap to focus pressure
 - c. A windlass or tightening mechanism
 - d. Transparent material for visibility
2. What is the main reason belts are not recommended for use as improvised tourniquets?
 - a. They are made of leather
 - b. They cannot be tightened evenly or enough to stop bleeding
 - c. They are too wide and soft
 - d. They work better on arms than legs
3. Which commercial tourniquet is most widely used in EMS and military settings?
 - a. RATS
 - b. SOFTT-W
 - c. CAT
 - d. TMT
4. When creating an improvised tourniquet, what is the best item to use as a windlass?
 - a. A sturdy stick or carabiner
 - b. A shoelace
 - c. A pencil
 - d. A pair of gloves
5. Why is the RATS tourniquet less commonly recommended in EMS settings?
 - a. It is too expensive
 - b. It uses a windlass instead of elastic
 - c. It can be difficult to stop bleeding effectively on larger limbs
 - d. It cannot be carried in a first aid kit

Lesson Four – Tourniquet Equipment and Variations

LEARN: Slide Presentation

15 minutes

Purpose:

Participants will gain a clear understanding of the different types of tourniquets used in bleeding emergencies.

Materials:

- Lesson 4 slide presentation

Facilitation Steps:

Share the following information as you show the slide presentation.

Slide 1: Tourniquet Equipment and Variations
Welcome to Lesson 4! So far, you have learned when to use a tourniquet and why they are so important. Now we will look at the different types of tourniquets you might come across, how they work, and what makes each one effective.

Slide 2: Objectives

By the end of today's lesson, you will be familiar with several types of tourniquets, understand the design and function of common models, know what makes each one effective, and feel confident choosing the right one in different emergency situations.

Slide 3: What Makes a Tourniquet Effective?

No matter the brand, color, or design, every effective tourniquet shares a few critical features that make it capable of stopping life-threatening bleeding.

First, it needs to be at least 1.5 inches wide. That width is important because it helps distribute pressure evenly across the limb. If a tourniquet is too narrow, like a shoelace or zip tie, it can cut into the skin and soft tissue, causing damage without fully stopping the bleeding.

Next, the material matters. Tourniquets need to be made of strong, durable components that will not stretch or break under pressure. When you twist a windlass to tighten it, you generate a lot of force. If the material snaps, you are back at square one.

Finally, an effective tourniquet has a tightening mechanism, like a windlass, ratchet, buckle, or elastic compression system, that allows you to crank down pressure until the bleeding stops completely and the distal pulse is no longer detectable. If the bleeding slows but does stop, or you can still feel a pulse below the site, then the tourniquet is not tight enough.

In the next few slides, we will look at some of the most common commercial tourniquets used in emergency medical services (EMS), the military, and law enforcement, and break down what makes each one unique and effective, or in some cases, what their limitations might be.

Slide 4: CAT: Combat Application Tourniquet

The CAT tourniquet, short for Combat Application Tourniquet, is probably the most used tourniquet in both EMS and military settings. One of its biggest advantages is that it is designed for one-handed use, which is important if the responder is injured or applies it to themselves.

It uses a hook-and-loop strap to secure the band around the limb, and then a windlass rod, that is the stick-shaped piece, to twist and apply pressure. Once it is tight enough to stop the bleeding, the windlass is locked into place using a clip. There is also a label where you can write down the time of application.

This tourniquet is reliable, widely available, and the most studied model out there. If you work in EMS or another type of emergency services, this is likely the type you will encounter most often.

Slide 5: SOFTT-W: Special Operations Forces Tourniquet - Wide

The SOFTT-W, which stands for Special Operations Forces Tactical Tourniquet – Wide, is another tourniquet often used in tactical or military situations. It is known for being extra durable with stronger materials than the CAT.

The main difference is that it uses a metal windlass, making it less likely to break under stress. But it can be a little harder to apply with one hand. While it is great for rugged environments, it might not be ideal for self-application.

It also does not have as much hook-and-loop fastening. Some users like that because it is easier to use in muddy, bloody, or wet conditions. Overall, this tourniquet is tough, long-lasting, and dependable in extreme settings.

Slide 6: RATS: Rapid Application Tourniquet System

The RATS tourniquet is a smaller, more compact option. It uses a strong elastic cord that wraps around the limb several times and then hooks into place. It is very lightweight and easy to carry, which is why many law enforcement officers keep one in their gear.

However, it is not as effective for larger limbs or for patients like children or those with less muscle tone. It can also be harder to apply consistent pressure evenly.

There has also been some controversy around the RATS because some medical studies have found it does not always stop arterial bleeding. While it is better than nothing, many EMS and trauma experts do not consider it a first choice.

Slide 7: TMT: Tactical Mechanical Tourniquet

The TMT is one of the newer commercial models on the market. It features a wide band, which helps reduce the chance of nerve and tissue damage, and it uses a mechanical tightening system, kind of like a built-in ratchet, rather than a windlass.

What makes it stand out is how easy it is to apply. The quick-release buckle and clear tightening mechanism make it great in high-stress environments where time matters.

It is already being adopted by some EMS agencies, especially because of its user-friendly design and clinical effectiveness. If you use a TMT in the field, you will likely find it fast, smooth, and effective, especially when the bleeding is severe.

Slide 8: Improvised Tourniquets (Last Resort)

There may come a time when a commercial tourniquet is not available. In that case, you can improvise, but only as a last resort. Improvised tourniquets can be dangerous if the wrong material is used or it is applied inappropriately. Commercial tourniquets are always the preferred tourniquets to use for life-threatening bleeding.

However, if you must use an improvised tourniquet, you need to use wide, non-stretchy material, like a triangular bandage, necktie, bandana, or sturdy cloth. Whatever you use, make sure it is at least 1.5 inches wide, so it does not cut into the skin. You will need a windlass, like a sturdy stick or carabiner, to twist and tighten the material until the bleeding stops.

Improvised tourniquets are often less reliable and harder to apply correctly. They can work but are far more likely to fail. Only use one if you absolutely have no other option.

Slide 9: What **Not to Use as a Tourniquet**

It is important to know what **not** to use. When people panic, they grab whatever is nearby, but some materials can make the situation worse. Avoid using anything thin or stretchy, like shoelaces, rubber tubing, or bungee cords. These might seem strong, but they can dig into the skin, damage nerves, and often fail to stop arterial bleeding.

Rule of Thumb: If it cannot apply firm, even pressure over a wide surface, it is not safe or effective as a tourniquet. Always go for wide, firm, and non-stretchy materials.

Slide 10: Material Options

Let's take a moment to talk about materials you could use in an emergency if a commercial tourniquet is not available.

There are some good options that can work well, if used correctly. These include materials like a necktie, scarf, bandana, or even a handkerchief, if they are wide and strong enough to apply pressure. You can also use a triangular bandage folded into a wide strip or a piece of nylon webbing; both are commonly found in first aid kits and backpacks.

All these materials are at least 1.5 inches wide, which helps apply pressure evenly across the limb and reduces the chance of causing more damage.

Now let's look at the bad options. These are materials we often see people try to use in a panic, like belts or zip ties. While they may seem strong, belts are often too stiff to tighten properly. Zip ties are too narrow and can cut into the skin, causing nerve or tissue damage without fully stopping the bleeding.

If it is wide, strong, and flexible enough to use with a windlass, it is probably a good option. If it is thin, stretchy, or cannot be tightened effectively, it is not safe or effective as a tourniquet.

Slide 11: Windlass Options

Now, let's talk about the windlass, the part of the tourniquet you use to twist and tighten the band until the bleeding stops. When making an improvised tourniquet, having the right windlass is just as important as having the right material for the strap.

Some good options include everyday items that are strong, solid, and long enough to grip. A carabiner is great because it is durable and easy to hold. A sturdy stick, jack handle, or even a broken broom handle can also work, especially if you are in an outdoor or home setting. It must withstand twisting without breaking, and you must be able to secure it in place once bleeding is controlled.

Pens or pencils are common suggestions that look like good options but aren't. They break easily under pressure and are too small to twist with control. Hands are another poor option. Some people try to hold the pressure with their hands, but that is not reliable. You cannot keep consistent pressure for long enough and will exhaust yourself quickly.

Remember: A windlass needs to be solid, easy to grip, and secure. If it is flimsy or hard to hold onto, it will not help you stop the bleeding.

Slide 12: Comparing Tourniquets: Key Differences

Here is a side-by-side comparison to help you see the key differences.

The **CAT** is probably the most versatile and is common in both EMS and military.

The **SOFTT-W** is built tough for harsh environments, but it is harder to use with one hand.

The **RATS** is compact and easy to carry, but it may not always work as well in a clinical setting.

The **TMT** is newer, easy to use, and designed to be safer for the patient.

Understanding the strengths and weaknesses of each model helps you make a smart choice when every second counts.

Slide 13: Review: Know Your Equipment

Let's review what we have learned. Every effective tourniquet needs to be wide, strong, and secure. Choose one that allows for a tight seal and stops bleeding completely.

Practice with the equipment that is in your trauma or first aid kits, whether it is a CAT, SOFTT-W, or other model. You should also know the pros and cons of each style.

Remember: An improvised tourniquet should never be your first choice. If you do use one, make sure it is done correctly.

The more confident you are with your gear, the more focused and effective you will be in the moment.

Slide 14: Questions?

Do you have any questions about the tourniquets we discussed today? Think about which type you would feel most confident using and why.

Slide 15: Student Participation

Excellent job today! In our final lesson, we will focus on what happens after the tourniquet is applied. That includes how to monitor the patient, communicate with EMS, and make sure the handoff goes smoothly. Now, we will take a short test on the different types of tourniquets and participate in activities with the Trauma Injury Simulator, exploring different tourniquet options.

Lesson Four – Tourniquet Equipment and Variations

REVIEW: Practice Applying a Variety of Tourniquets

20 minutes

Purpose:

Participants will use the Trauma Injury Simulator to understand how different types of tourniquets function in controlling severe bleeding.

Materials:

- *Lesson 4* side presentation (for review)
- *Tourniquet Equipment and Variations Test*
- *Tourniquet Equipment and Variations Test – Answer Key*
- *Student Activity* worksheet
- *Student Activity – Answer Key*
- *Scenarios* worksheet
- *Scenarios – Answer Key*
- Trauma Injury Simulator
- A variety of materials and objects that could be used as an improvised tourniquet and windlass (including objects that are not advised, like a belt or shoelace)

Facilitation Steps:

1. Begin with Slide 3 to review what makes a tourniquet effective. Emphasize width (at least 1.5 inches), durability, and a secure tightening mechanism, such as a windlass or ratchet. Reinforce the importance of stopping both bleeding and the distal pulse.
2. If available, use a commercial tourniquet (such as a CAT) to demonstrate the parts of the device, including the strap, windlass, hook-and-loop strap, and time label. Then, introduce materials that could be used to create an improvised tourniquet, such as a triangular bandage folded into a wide strip, a carabiner, or sturdy stick for the windlass.

3. Allow students to practice assembling and securing an improvised tourniquet using the materials.
4. As part of the learning process, demonstrate ineffective tools like shoelaces, belts, or rubber tubing. Show why they do not meet the criteria of an effective tourniquet, whether due to being too narrow, inflexible, or lacking a windlass. This helps reinforce why improvisation must be done carefully and only as a last resort.
5. Demonstrate proper tourniquet application using the Trauma Injury Simulator. Remind students that tourniquets can cause tissue damage and are not to be practiced on each other.
6. Distribute the worksheets.
7. Rotate small groups through the simulator station, allowing each student to apply a tourniquet or observe the process while the rest of the students start on the *Scenarios* worksheet.
8. Present a short scenario to provide context and urgency, such as:
“You are called to help a surfer with a deep thigh wound that is spurting blood. You must act fast. What do you do?”
9. After each group completes their time with the simulator, instruct them to begin the *Student Activity* worksheet, reflecting on the types of tourniquets used.

10. If students have not worked on the *Scenarios* worksheet while waiting their turn for the simulator, you can have them start now.
11. Once all students have had an opportunity to practice or observe with the simulator and completed their worksheets, instruct them to complete the post-test.
12. After completing the post-test, review the correct answers as a group and allow students to self-check their work using the answer key provided.
13. Review the scenarios and discuss as a class what students observed and learned. If the scenarios were not completed during the activity, this part can be skipped.

Name: _____ Class: _____

Student Activity

Instructions: Work with your group to apply various tourniquets using the Trauma Injury Simulator. Follow the scenario your instructor gives you. After practicing with the simulator, answer the following questions:

1. What type of tourniquet(s) did you use on the simulator?

☐ CAT

☐ SOFTT-W

☐ RATS

☐ Other: _____

2. Was the tourniquet easy or challenging to apply? Why?

3. How did you know the tourniquet was working properly?

☐ The bleeding stopped

☐ No pulse was felt below the tourniquet

☐ It was tight and secure

☐ All the above

4. What would you do differently if you had to apply the same tourniquet again?

Improvised Tourniquet Practice (if completed)

5. What materials did you use to make the improvised tourniquet?

6. What did you use as a windlass (tightening tool)?

7. Was the improvised tourniquet able to stop the bleeding (or simulated bleeding)?

☐ Yes

☐ No

☐ Partially

If no or partially, what may have gone wrong?

8. What challenges did you face while creating or applying an improvised tourniquet?

9. What did this activity teach you about the limitations of improvised tourniquets?

10. What type of tourniquet did you feel most comfortable using? Why?

Name: _____ Class: _____

Scenarios

Instructions: Read each scenario and answer the questions below.

Scenario 1: Skating Accident

You are helping at a city park event when a skateboarder falls and crashes into a metal railing. He has a deep cut on his forearm, and bright red blood is spurting out. A first aid kit nearby contains a CAT tourniquet and a RATS tourniquet.

Which tourniquet would you choose for this patient and why?

How would you apply it? How do you know if it is effective?

What features made the CAT or RATS a better choice in this situation?

Scenario 2: Hiking Injury

While hiking, your friend slips and lands on a jagged rock, resulting in a severe leg wound with pulsing, uncontrolled bleeding. There is no commercial tourniquet available, but your group has:

- A belt
- A triangular bandage
- A sturdy stick
- A shoelace

What materials would you use to create an improvised tourniquet?

Which items should you avoid using? Why?

Where would you place the tourniquet? What is the first thing you check after applying it?

Scenario 3: Vehicle Accident

You respond to the scene of a vehicle crash. One of the passengers has a deep wound to the lower arm with steady, dark red bleeding. You notice a large amount of blood on the seat and floor. The patient is pale and says they feel dizzy. A bystander hands you a first aid kit containing two tourniquet options: a CAT and RATS.

Based on the bleeding description, would you apply a tourniquet or try direct pressure first?

If you decide to use a tourniquet, which one would you choose? Why?

What features of that tourniquet make it more effective in this situation?

Scenarios – Answer Key

Instructions: Read each scenario and answer the questions below.

Scenario 1: Skating Accident

You are helping at a city park event when a skateboarder falls and crashes into a metal railing. He has a deep cut on his forearm, and bright red blood is spurting out. A first aid kit nearby contains a CAT tourniquet and a RATS tourniquet.

Which tourniquet would you choose for this patient and why?

Preferably, the CAT tourniquet because it is wide, easy to apply, and more effective for severe bleeding.

How would you apply it? How do you know if it is effective?

Apply two to three inches above the wound, tighten until the bleeding stops, secure the windlass, and check for no distal pulse.

What features made the CAT or RATS a better choice in this situation?

The CAT has a windlass, a wide strap, and is reliable in emergencies, making it more effective than the elastic RATS.

Scenario 2: Hiking Injury

While hiking, your friend slips and lands on a jagged rock, resulting in a severe lower leg wound with pulsing, uncontrolled bleeding. There is no commercial tourniquet available, but your group has:

- A belt
- A triangular bandage
- A sturdy stick
- A shoelace

What materials would you use to create an improvised tourniquet?

Use the triangular bandage folded wide, with the sturdy stick as the windlass.

Which items should you avoid using? Why?

Avoid the shoelace (too narrow) and belt (hard to tighten properly).

Where would you place the tourniquet? What is the first thing you check after applying it?

Place high on the leg, two to three inches above the wound or up in the groin. Check that the bleeding has stopped and there is no distal pulse.

Scenario 3: Vehicle Accident

You respond to the scene of a vehicle crash. One of the passengers has a deep wound to the lower arm with steady, dark red bleeding. You notice a large amount of blood on the seat and floor. The patient is pale and says they feel dizzy. A bystander hands you a first aid kit containing two tourniquet options: a CAT and a RATS.

Based on the bleeding description, would you apply a tourniquet or try direct pressure first?

Try direct pressure first since the bleeding is steady and dark red (suggesting venous bleeding), not spurting like an arterial bleed.

If you decide to use a tourniquet, which one would you choose? Why?

If direct pressure failed, I would choose the CAT tourniquet, which is more effective and easier to control.

What features of that tourniquet make it more effective in this situation?

The CAT's wide band and windlass allow for tight, consistent pressure to fully stop bleeding if needed.

Tourniquet Equipment and Variations Test – Answer Key

Instructions: Select the best answer to the multiple-choice questions below.

1. Which of the following features is essential for an effective tourniquet?
 - a. Stretchy material for flexibility
 - b. Narrow strap to focus pressure
 - c. A windlass or tightening mechanism**
 - d. Transparent material for visibility
2. What is the main reason belts are not recommended for use as improvised tourniquets?
 - a. They are made of leather
 - b. They cannot be tightened evenly or enough to stop bleeding**
 - c. They are too wide and soft
 - d. They work better on arms than legs
3. Which commercial tourniquet is most widely used in EMS and military settings?
 - a. RATS
 - b. SOFTT-W
 - c. CAT**
 - d. TMT
4. When creating an improvised tourniquet, what is the best item to use as a windlass?
 - a. A sturdy stick or carabiner**
 - b. A shoelace
 - c. A pencil
 - d. A pair of gloves
5. Why is the RATS tourniquet less commonly recommended in EMS settings?
 - a. It was too expensive
 - b. It uses a windlass instead of elastic
 - c. It can be difficult to stop bleeding effectively on larger limbs**
 - d. It cannot be carried in a first aid kit

Sources

1. MCM Website (2024, March 27). *Saving Lives With precision: Understanding the Different Types of Emergency Tourniquets*. Retrieved from <https://www.masscasualtymedicine.com/post/saving-lives-with-precision-understanding-the-different-types-of-emergency-tourniquets>
2. Graddon, Brian (2022, November). *How to Make an Improvised Tourniquet (And Why It's Usually a Bad Idea)*. Retrieved from <https://truerescue.com/blogs/knowledge/how-to-make-a-tourniquet>
3. Smith, Graeme (2018, August 26). *Improvised Tourniquets*. Retrieved from <https://www.teessidefirstaid.com/improvised-tourniquets/>

Lesson Five – Post-Application Care and Communication

Lesson Overview

In this lesson, students will learn how to care for a patient after a tourniquet has been applied. They will explore how to monitor the patient for signs of shock, the importance of documenting the time of application, and how to effectively communicate key information to EMS. The lesson also emphasizes what not to do, such as loosening or covering a tourniquet, and why post-application care plays a critical role in patient outcomes. Through discussion, simulation, and scenario-based activities, students will build confidence in performing this final, life-saving step.

Lesson Objectives

After completing this lesson, participants will be able to:

- Know the immediate actions after tourniquet use
- Perform a visual summary
- Monitor the patient after tourniquet application
- Understand what **not** to do
- Communicate with EMS and other healthcare providers

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
FOCUS	• <i>Post-Application Care and Communication</i> worksheet • <i>Post-Application Care and Communication – Answer Key</i> • <i>Post-Application Care and Communication Test</i>	1. Print/photocopy the <i>Post-Application Care and Communication</i> worksheet (one per participant). 2. Print/photocopy the <i>Post-Application Care and Communication Test</i> (two per participant). 5. Access the worksheet answer key.	10 minutes
LEARN	• <i>Lesson 5</i> slide presentation	1. Prepare the <i>Lesson 5</i> slide presentation for viewing.	15 minutes
REVIEW	• <i>Lesson 5</i> slide presentation (for review) • <i>Post-Application Care and Communication Test</i> • <i>Post-Application Care and Communication Test – Answer Key</i> • <i>Report to EMS</i> worksheet • <i>Report to EMS – Answer Key</i>	1. Access the answer keys. 2. Print/photocopy the <i>Report to EMS</i> worksheet (one per participant).	20 minutes

Instructor Note: Focus activities may also be completed prior to class.

Lesson Five – Post-Application Care and Communication

FOCUS: Developing Critical Thinking and Decision-Making Skills

10 minutes

Purpose:

Help students develop critical thinking and decision-making skills.

Materials:

- *Post-Application Care and Communication* worksheet
- *Post-Application Care and Communication* – Answer Key
- *Post-Application Care and Communication* Test

Facilitation Steps:

1. Distribute the *Post-Application Care and Communication*) worksheets before or at the beginning of class and have the answer key available.
2. Distribute two copies of the *Post-Application Care and Communication* Test and explain to the students that, upon your instruction, one is to be taken at the start of class and one at the end.
3. Have students read the information and complete the worksheet and pre-test. Information from the pre-test can be compared with information from the post-test, which participants will take upon completion of the lesson, to measure changes in their knowledge.
4. Have students pair up after completing the worksheet and test to share answers from the worksheet.

Post-Application Care and Communication

Purpose: Develop critical thinking and decision-making skills

READ the following:

You are working as a student volunteer at a weekend first aid booth near a skatepark when a teenager, Leo, crashes while attempting a trick. He lands hard on a broken piece of metal edging near a ramp, resulting in a deep wound to his lower arm. You rush over and immediately notice rapid, steady bleeding and pale, clammy skin.

A friend holds a t-shirt over the wound but says it will not stop bleeding. You grab the CAT tourniquet from your first aid kit and apply it about three inches above the injury. After tightening the windlass and securing it in place, the bleeding stops completely. You check for a radial pulse and do not find one. You record the time of application directly on Leo's forearm with a marker.

Leo seems dazed and says he feels tired and cold. You cover him with a jacket, keep talking to him calmly, and have another volunteer call 911. When EMS arrives, you report what happened, when the tourniquet was applied, what symptoms Leo had, and what care you have provided.

REFLECT on the situation:

What were you thinking and feeling during this emergency?

What steps did you take immediately after applying the tourniquet?

What information did you share with EMS when they arrived?

Why is it important to monitor a patient even after bleeding has stopped?

What would you do differently next time if anything?

SHARE your thoughts with a peer when it is discussion time.

Post-Application Care and Communication – Answer Key

Purpose: Develop critical thinking and decision-making skills

READ the following:

You are working as a student volunteer at a weekend first aid booth near a skatepark when a teenager, Leo, crashes while attempting a trick. He lands hard on a broken piece of metal edging near a ramp, resulting in a deep wound to his lower arm. You rush over and immediately notice rapid, steady bleeding and pale, clammy skin.

A friend holds a t-shirt over the wound but says it will not stop bleeding. You grab the CAT tourniquet from your first aid kit and apply it about three inches above the injury. After tightening the windlass and securing it in place, the bleeding stops completely. You check for a radial pulse and do not find one. You record the time of application directly on Leo's forearm with a marker.

Leo seems dazed and says he feels tired and cold. You cover him with a jacket, keep talking to him calmly, and have another volunteer call 911. When EMS arrives, you report what happened, when the tourniquet was applied, what symptoms Leo had, and what care you have provided.

REFLECT on the situation:

What were you thinking and feeling during this emergency?

I felt nervous because the patient looked like he might pass out, but I focused on keeping calm and remembering my training. I knew the bleeding had to stop first. Then, I needed to keep monitoring him until EMS arrived.

What steps did you take immediately after applying the tourniquet?

I checked for a radial pulse to make sure the bleeding had stopped completely, then wrote down the time on his forearm. I reassured him while keeping him warm. I also asked someone to call 911 so EMS would be dispatched.

What information did you share with EMS when they arrived?

I told them the location of the injury, the type of bleeding I saw, when the tourniquet was applied, and that Leo said he was tired and cold. I also let them know that I put a jacket around him to keep him warm and that he was alert at first but had been getting more confused.

Why is it important to monitor a patient even after bleeding has stopped?

Stopping the bleeding is critical, but the patient can still go into shock. Watching their breathing, skin color, and mental state helps you notice if things are getting worse while you wait for help.

What would you do differently next time, if anything?

Next time, I would try to talk more calmly and slowly so I do not sound panicked when explaining the situation. I would also assign someone to call 911 sooner than I did.

SHARE your thoughts with a peer when it's discussion time.

Name: _____

Class: _____

Post-Application Care and Communication Test

Instructions: Select the best answer to the multiple-choice questions below.

1. What should you do immediately after applying a tourniquet?
 - a. Loosen it slightly to reduce pain
 - b. Cover it with a blanket
 - c. Make sure bleeding has stopped and record the time
 - d. Remove it to allow circulation
2. Why is it important to keep the tourniquet visible?
 - a. It helps the patient stay warm
 - b. EMS needs to locate and evaluate it quickly
 - c. It looks more professional
 - d. To keep it from shifting out of place
3. Which of the following is a sign of shock?
 - a. Calm behavior and warm skin
 - b. Restlessness, rapid breathing, and pale skin
 - c. Loud talking and flushed face
 - d. Complaints of boredom
4. If you forget to write down the time of application, what should you do?
 - a. Remove the tourniquet and reapply it
 - b. Pretend it was not used
 - c. Estimate the time and tell EMS
 - d. Apply a second tourniquet for backup
5. What should be included when reporting to EMS?
 - a. The patient's opinion on their pain level
 - b. Exact blood pressure readings
 - c. The type of injury
 - d. What commercial brand of tourniquet was used

Lesson Five – Post-Application Care and Communication

LEARN: Slide Presentation

15 minutes

Purpose:

Participants will gain a clear understanding of the critical steps to take after a tourniquet is applied. They will learn how to monitor the patient for signs of shock, ensure the tourniquet remains effective and visible, and accurately document the time of application.

Materials:

- Lesson 5 slide presentation

Facilitation Steps:

Share the following information as you show the slide presentation.

Slide 1: Post-Application Care and Communication

Welcome to our final lesson on trauma injuries! So far, we have learned when and how to apply a tourniquet, why it works, and what tools to use. Now, we are going to cover what to do after the tourniquet is in place.

Post-application care is just as important, because stopping the bleeding is only step one. What you do next can have a significant impact on the patient's outcome.

Slide 2: Objectives

Let's take a moment to walk through today's objectives, which outline what you will learn and practice in this final lesson.

We will begin by focusing on what you should learn immediately after a tourniquet is applied. This includes checking for bleeding control, confirming there is no distal pulse, and keeping the tourniquet visible and secure.

Then, you must perform a visual summary, meaning you use a checklist to make sure all critical steps have been completed before EMS arrives. It is a quick way to confirm you did not miss anything.

You will also learn how to monitor the patient after tourniquet placement. That includes watching for signs of shock, changes in consciousness, and overall patient stability. Remember, bleeding control is only one part of patient care.

Next, we will focus on what you need to understand about what **not** to do. There are common mistakes, like removing or loosening the tourniquet, that can put the patient at serious risk. We will make sure you know how to avoid those.

Finally, we will cover how to communicate effectively with EMS and other medical professionals. This includes reporting the injury, the time of tourniquet application, and how the patient responded.

Together, these objectives will give you the complete skillset to manage the scene after bleeding is controlled and ensure the patient transitions safely into the next phase of care.

Slide 3: Immediate Actions After Tourniquet Application

Right after applying the tourniquet, your priority is to confirm that it is functioning correctly.

You should no longer see active bleeding. If you check for a distal pulse, like the radial pulse in the wrist or pedal pulse in the foot, it should be absent.

Once the bleeding is controlled, leave the tourniquet in place. Do not loosen it.

Another crucial point is to keep the tourniquet visible. Do not cover it with clothing or blankets, because EMS and hospital staff need to see that it is there immediately. Visibility helps ensure the patient gets timely and appropriate follow-up care.

Slide 4: Recording the Time of Application

Recording the time you applied the tourniquet is one of the most important follow-up steps.

Most commercial tourniquets, like the CAT, have a label you can write on. If there is no label, write the time directly on the patient's skin with a marker near the tourniquet. Some medical classes even teach to write the time on a piece of tape and attach it to the patient's forehead in the event the tourniquet accidentally gets covered.

Use a 24-hour time format if you can, such as 16:47 instead of 4:47 p.m., to avoid any confusion. If you do not know this format, it is easy to learn if you search on the internet. It is also called military time.

Writing down the time is important because how long the tourniquet has been in place can affect how the hospital treats the injury. Long tourniquet times can lead to nerve damage, tissue death, or other complications, so this information is vital to pass along.

Slide 5: Monitor the Patient

Even with the bleeding controlled, the patient may still be in a fragile condition.

They may go into shock, especially if they lost a lot of blood was lost before the tourniquet was applied. Keep an eye out for signs like pale or clammy skin, rapid breathing, restlessness, or a drop in mental alertness.

Keep the patient calm and warm, using a blanket if needed. Talk to them, reassure them, and let them know help is on the way.

Continue to reassess their breathing and mental status. A stable patient can quickly become unstable if they are losing blood internally or suffering from low oxygen levels.

Slide 6: What **Not to Do**

This slide covers a few critical actions to avoid that can make the difference between life and death.

It is crucial that you never remove the tourniquet once it is in place, even if the patient says they feel better. You cannot judge the depth of the injury or how fast bleeding might return.

Do not cover the tourniquet with pants, coats, or blankets. It needs to be visible for EMS to act quickly.

Do not delay calling for help. The sooner you get EMS on scene, the better.

Finally, do not assume the patient is in the clear just because the bleeding stopped. Internal injuries, blood loss, and shock can still happen even if they look okay from the outside.

Slide 7: Visual Summary: Post-Application Checklist

This slide gives you a quick, visual checklist to run through after tourniquet use.

The bleeding has stopped.

There is no distal pulse.

You wrote down the time of application.

The tourniquet is clearly visible.

You are actively monitoring the patient.

You have called EMS or are preparing to hand off care.

If all these boxes are checked, you have done your part well!

Slide 8: Communicating with EMS

When EMS arrives, your communication is critical. You are speaking on behalf of the patient, especially if they are confused, unconscious, or in shock.

There are four key pieces of information you should report:

- Let responders know exactly where the wound is and what kind of bleeding you saw. Was it spurting, steady, or oozing?
- If you wrote when the tourniquet was applied, show them. If not, give your best estimate, anything helps.
- Provide an estimate of how much blood the patient lost. We do not carry measuring cups in the field, but we can use a few visual rules of thumb:
 - A small pool of blood, about 6 inches across, is around 100 mL
 - A medium pool, about 12 inches wide, could be 300–500 mL
 - A large pool, over 18 inches or soaking through clothing like a

- shirt or pants, could be 1,000 mL or more
- Once someone has lost about 20-30% of their total blood volume, which is around 1.5 liters, they have elevated risk of going into shock. Instead of guessing a number, describe what you saw. Say something like, “There was a large pool of blood under the patient, and their pants were soaked through.” That is more useful and accurate for EMS.
- Share how the patient has been doing since you applied the tourniquet. If they were alert and talking earlier but are now confused, groggy, or having trouble breathing, those changes are vital for responders to know.

Do not worry or be nervous, stick to the facts. Clear, calm, and accurate communication helps EMS make faster, better treatment decisions and sets the patient up for the best possible outcome.

While the first responders are thankful for your help and report, do not expect them to stick around and want to talk to you. They are not being rude; their priority is the patient. Once you have given your report, they will quickly move on to help them.

Slide 9: Why This Matters

This is an important topic because it saves lives.

Everything you do after applying the tourniquet helps guide the next phase of care.

If EMS knows how long the tourniquet has been on, they can better assess how much damage might be done to the limb. It could determine if the patient needs surgery, fluids, or a blood transfusion.

Failing to communicate or document this properly could delay treatment or increase the risk of complications. Even though your hands-on work might feel done, your role in the patient’s care is not over yet.

Slide 10: Common Student Questions

This is a suitable time to address some questions we often hear from students during this lesson.

Can I loosen the tourniquet once the bleeding stops? No, you should never loosen or remove a tourniquet once it is applied. The risk of restarting heavy bleeding is too high. However, there is a situation when you might remove a tourniquet that we will cover here in a minute.

What if I forget to write down the time? Try to give EMS your best estimate of when it was applied. An approximate time is better than nothing.

What if the patient wants me to take the tourniquet off? Their request is understandable; they are probably in pain. However, you must explain that the discomfort means it is working saving their life.

What if someone already applied a poorly improvised tourniquet before I got there? If the original tourniquet is obviously ineffective, like a shoelace or belt that is not stopping the bleeding, and you have a better option, like a commercial tourniquet or properly improvised one, you can apply the correct tourniquet. Just be sure you do not remove the bad one first. Instead, apply your new tourniquet two to three inches above the bad one, tighten it until the bleeding stops. Then, you can safely remove the old one.

Slide 11: Review

Let’s take a final look at what we have learned today:

- Never remove or loosen a tourniquet once it is applied.
- Keep the patient calm and warm, monitoring for signs of shock or deterioration.
- Write down the time of application and report it to EMS.
- Do not cover the tourniquet. Leave it clearly visible.
- Communicate everything you have done clearly and confidently.

These small actions can have a significant impact on the outcome for your patient. The job does not end at stopping the bleed; it continues until the next level of care takes over.

Slide 12: Questions?

Before we move into the final activity and test, what questions do you have?

Have you ever seen a situation like this in real life? Would you feel confident reporting to EMS if you had to?

This is your moment to clarify anything you are unsure about. Do not hesitate to speak up; it is how you build confidence.

Slide 13: Student Participation

Now it is time to put what you have learned into practice.

In your small groups, you will receive a scenario and be asked to verbally report to EMS as if you were handing off care. Think about what you would say:

- What happened?
- What type of bleeding was it?
- When was the tourniquet applied?
- How is the patient doing now?

Then, we will conclude with a short post-test to check your understanding of the lesson.

Lesson Five – Post-Application Care and Communication

REVIEW: Practice Post-Application Care and Communication

20 minutes

Purpose:

Participants will work through realistic scenarios focused on caring for a patient after a tourniquet has been applied. They will practice identifying signs of shock, documenting the time of tourniquet application, and preparing to communicate key information to EMS.

Materials:

- Lesson 5 slide presentation (for review)
- *Post-Application Care and Communication Test*
- *Post-Application Care and Communication Test – Answer Key*
- *Report to EMS* worksheet
- *Report to EMS – Answer Key*

Facilitation Steps:

1. Begin with Slide 3 to introduce post-application care. Emphasize the importance of confirming that bleeding has stopped, checking for the absence of a distal pulse, and making sure the tourniquet is visible and not removed. Reinforce that care continues after bleeding control, especially monitoring for shock and communicating clearly with EMS.
2. Using Slide 4, demonstrate how to properly document the time of tourniquet application. If a commercial tourniquet with a label is available (e.g., CAT), show how to use it. If not, demonstrate writing the time directly on the patient's skin with a marker near the tourniquet.
3. Display Slide 5 and review key signs of patient deterioration, such as pale or cool skin, rapid breathing, and confusion. Discuss how to monitor and support the patient while waiting for help. Emphasize the importance of keeping the patient calm and warm.
4. Move into the group activity using the *Report to EMS* worksheet. Divide students into small groups or pairs and assign them the provided scenarios. Each student or group should read the scenario, discuss their response, and practice verbally reporting their findings and actions to a peer playing the role of EMS. Encourage them to use the EMS Report Checklist on the worksheet to guide their handoff.
5. As students rotate through the scenarios, circle the room to observe students, guide discussion, and answer questions. Reinforce accurate verbal reporting, correct terminology, and calm communication under pressure.
6. After each group has practiced their verbal reports and completed the scenario questions, instruct students to complete the post-test. Remind them to take their time and refer back to what they learned in the lesson and activity.
7. Review the post-test answers as a class, using the answer key provided. Allow students to self-check and ask questions about any missed items. If time allows, debrief the activity by discussing common mistakes, strengths, and takeaways from the EMS reporting scenarios.

Name: _____

Class: _____

Report to EMS

Instructions: Work with a partner or small group. Read each scenario and answer the reflection questions together. Then take turns practicing your verbal EMS report using the checklist.

EMS Report Checklist

Make sure your report includes:

- ✓ Type and location of injury
- ✓ Type of bleeding (spurting, steady, etc.)
- ✓ Time of tourniquet application
- ✓ Patient's current condition (shock, confusion, etc.)
- ✓ What you have done so far

Scenario 1: ATV Crash

You arrive at the scene of an ATV accident. The 43-year-old male rider has a deep wound to the lower leg, with dark red bleeding that is actively soaking through a towel he applied. You decide to apply a tourniquet just above the knee using a commercial device. Bleeding has stopped, and there is no pedal pulse. The rider is shivering and confused. You write the application time on his leg.

What post-application care will you provide? What will you tell EMS when they arrive?

Scenario 2: Construction Site Fall

A 26-year-old female construction worker falls from a ladder and lands on rebar outside a department store you are visiting, causing a severe laceration to the upper arm. Bright red blood spurts until you apply a tourniquet high on the arm. Bleeding stops, but the worker's skin is pale. She is conscious and breathing rapidly. As you wait for EMS to arrive, you notice she is fading in and out of consciousness.

What concerns do you have about this patient, and what will you do until EMS arrives? Verbalize your report to EMS once they arrive.

Scenario 3: Surfing Incident

You are relaxing on the beach when you hear a commotion. A surfer is being helped out of the water after a fin on her surfboard sliced on her upper leg. Bleeding is heavy and pulsing until a makeshift tourniquet is placed high on the thigh. You record the time, and 911 is called. The patient is conscious and talking but weak and cold to the touch. EMS is still 5 minutes out.

What signs of shock do you notice? What can be done to support the patient? What will your report to EMS include?

Report to EMS – Answer Key

Instructions: Work with a partner or small group. Read each scenario and answer the reflection questions together. Then take turns practicing your verbal EMS report using the checklist.

EMS Report Checklist

Make sure your report includes:

- ✓ Type and location of injury
- ✓ Type of bleeding (spurting, steady, etc.)
- ✓ Time of tourniquet application
- ✓ Patient's current condition (shock, confusion, etc.)
- ✓ What you have done so far

Scenario 1: ATV Crash

You arrive at the scene of an ATV accident. The 43-year-old male rider has a deep wound to the lower leg, with dark red bleeding that is actively soaking through a towel he applied. You decide to apply a tourniquet just above the knee using a commercial device. Bleeding has stopped, and there is no pedal pulse. The rider is shivering and confused. You write the application time on his leg.

What post-application care will you provide? What will you tell EMS when they arrive?

I have written down the time of application and ensured the bleeding has stopped, and there is no pedal pulse. After calling 911 or having someone else do so, I would cover the patient in a blanket or jacket to keep him warm, while ensuring the tourniquet is still visible. My report to EMS will include:

- Injury to the lower leg with active dark red bleeding
- The blood loss soaked a large towel
- Commercial tourniquet applied above the knee
- Bleeding stopped, no pedal pulse
- Application time recorded on leg
- Patient showing signs of shock (shivering, confusion)
- Blanket/jacket applied to keep him warm

Scenario 2: Construction Site Fall

A 26-year-old female construction worker falls from a ladder and lands on rebar outside a department store you are visiting, causing a severe laceration to the upper arm. Bright red blood spurts until you apply a tourniquet high on the arm. Bleeding stops, but the worker's skin is pale. She is conscious and breathing rapidly. As you wait for EMS to arrive, you notice she is fading in and out of consciousness.

What concerns do you have about this patient, and what will you do until EMS arrives? Verbalize your report to EMS once they arrive.

This patient shows multiple signs of hypovolemic shock due to significant blood loss. Her pale skin, rapid breathing, and fluctuating consciousness are red flags. Even though the tourniquet stopped the bleeding, the body may still be struggling to circulate oxygen effectively. There is a risk of deterioration while waiting for EMS. I would keep her calm and warm and talk to her to help her stay awake.

My verbal report to EMS would sound like this: "This is a 26-year-old female who suffered a deep laceration to her upper left arm after falling onto rebar. The bleeding was bright red and spurting. I applied a tourniquet high on the arm, and the bleeding stopped. There is no radial pulse below the tourniquet. The tourniquet was applied at 14:45. The patient initially was alert but is now fading in and out of consciousness. Her breathing is rapid, and her skin is pale. I have kept her warm and lying flat. I have continued to monitor her until your arrival."

Scenario 3: Surfing Incident

You are relaxing on the beach when you hear a commotion. A surfer is being helped out of the water after a fin on her surfboard sliced on her upper leg. Bleeding is heavy and pulsing until a makeshift tourniquet is placed high on the thigh. You record the time, and 911 is called. The patient is conscious and talking but weak and cold to the touch. EMS is still 5 minutes out.

What signs of shock do you notice? What can be done to support the patient? What will your report to EMS include?

The patient is showing early signs of hypovolemic shock from blood loss. She is weak, cold to the touch, and has just had a pulsing arterial bleed controlled. Even though she is conscious and talking now, her condition could worsen quickly without proper care. I would keep her lying flat, cover her with a towel or blanket to keep her warm while keeping the tourniquet visible, and calmly talk to her and assure her that an ambulance is on the way.

My verbal report to EMS: "This is a surfer who suffered a deep laceration to her upper thigh from a surfboard fin. The bleeding was heavy and pulsing before a makeshift tourniquet was applied high on the leg. Bleeding is now controlled, and there is no pedal pulse below the tourniquet. The tourniquet was applied at 15:20. She is conscious and alert but cold to the touch and weak. I have kept her warm and lying flat. I have been monitoring her closely until you got here."

Post-Application Care and Communication Test – Answer Key

Instructions: Select the best answer to the multiple-choice questions below.

1. What should you do immediately after applying a tourniquet?
 - a. Loosen it slightly to reduce pain
 - b. Cover it with a blanket
 - c. Make sure bleeding has stopped and record the time**
 - d. Remove it to allow circulation
2. Why is it important to keep the tourniquet visible?
 - a. It helps the patient stay warm
 - b. EMS needs to locate and evaluate it quickly**
 - c. It looks more professional
 - d. To keep it from shifting out of place
3. Which of the following is a sign of shock?
 - a. Calm behavior and warm skin
 - b. Restlessness, rapid breathing, and pale skin**
 - c. Loud talking and flushed face
 - d. Complaints of boredom
4. If you forget to write down the time of application, what should you do?
 - a. Remove the tourniquet and reapply it
 - b. Pretend it was not used
 - c. Estimate the time and tell EMS**
 - d. Apply a second tourniquet for backup
5. What should be included when reporting to EMS?
 - a. The patient's opinion on their pain level
 - b. Exact blood pressure readings
 - c. The type of injury**
 - d. What commercial brand of tourniquet was used

Sources

1. Editorial Team (2024, June 25). *Mastering Military Tourniquet Application Guidelines*. Retrieved from <https://militarysphere.com/military-tourniquet-application-guidelines/>
2. McLaughlin, Brian (2022, March 17). *2 Reasons to Never Do This After Applying a Tourniquet*. Retrieved from <https://www.mountainmanmedical.com/2-reasons-to-never-do-this-after-applying-a-tourniquet/>
3. Admin (2020, April 24). *Should You Loosen a Tourniquet After It Is Applied?* Retrieved from <https://massinitiative.org/should-you-loosen-a-tourniquet-after-it-is-applied/>