CHAPTER 7

Immediate Treatment Considerations

Upon completing this chapter, the student should be able to:

1. Understand the OSHA wound care standards and their application in athletic training.
2. Be able to identify proper protocols for wound care.
3. Understand each aspect of the RICES principle and its affect on acutely injured tissues.
4. Understand the uses of both cold and heat modalities.
5. Discuss the various transporting techniques for an injured athlete.
6. Employ the principles used in the proper fitting and application of braces and splints.
7. Correctly fit and instruct a patient on the use of ambulatory aids.
8. Discuss the proper protocol for referral to both medical and nonmedical personnel.

Skills to be learned:

1. Employ universal precautions correctly while cleaning and dressing a wound.
2. Correctly apply all components of the RICES principle with an acute injury.

3. Correctly fit and instruct a patient on use of various ambulatory aids.
4. Correctly stabilize and transport an injured athlete.
5. Correctly apply a splint to stabilize a fracture or unstable joint.
6. Correctly select, fit, and apply a brace to protect an injured joint.

OSHA Standards

Beginning in 1991, the Occupational Safety and Health Administration (OSHA) included standard regulations specific to bloodborne pathogens. These standards described requirements for employers to follow that ensured safety for employees that may be exposed to bloodborne pathogens as part of their occupation. Because certified athletic trainers are often exposed to potentially infectious materials as part of their occupation, they are required to receive annual OSHA bloodborne pathogen training. The training is designed to provide information around the following: methods of transmission of bloodborne pathogens, exposure control plans, methods to reduce the risk of infection and transmission, personal protective equipment, clean up and disposal, and documentation of an exposure incident. A more detailed explanation of the OSHA standards can be found on the OSHA web site under the Regulations tab (http://www.osha.gov/).

Bloodborne Pathogens

Athletic trainers are often exposed to blood or other bodily fluids in their work environment. In some cases, the blood or bodily fluids may be contaminated with disease-causing microorganisms known as *bloodborne pathogens*. Because of this, athletic trainers must be aware of the potential for transmission and act to prevent the spread of infectious disease. Maintaining a clean and sterile work environment, as well as using personal protective equipment, is the best method of prevention. In addition, frequent hand washing between patients, especially those that seem ill, can reduce the risk of infection. Although there are numerous bloodborne pathogens, some are of increased concern in the athletic training setting (see Table 7.1). These are the human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV). Although HIV has garnered more attention in the media, both HBV and HCV are more likely to be contracted by an athletic trainer or athlete.

TABLE 7.1. Bloodborne Pathogens.

Bloodborne pathogens are microorganisms that are present in human blood that have the potential to cause disease. Examples are:
Human immunodeficiency virus (HIV): A virus that infects the immune system T_4 blood cells in humans making them more susceptible to other diseases. This virus is responsible for acquired immunodeficiency syndrome (AIDS).
Hepatitis B virus (HBV): A major cause of viral hepatitis, which causes swelling, soreness and loss of normal liver function.
Hepatitis C virus (HCV): The most common chronic bloodborne infection in the United States, which often develops into liver disease.

Universal Precautions

Universal precautions are a standard approach to infection control that defines blood and other bodily fluids as potentially infectious substances (see Table 7.2). Under these standards, *all* blood and bodily fluid should be considered infectious and thus, precautions should be taken to avoid transmission. However, some bodily fluids carry little to no risk of infection unless combined with blood (see Table 7.3). Precautions include the use of protective barriers or *personal protective equipment* (PPE) and immunization. Some examples of PPE include gloves, gowns, aprons, masks, protective eyewear, and disposable mouthpieces for resuscitation devices. In addition to employing the use of PPEs, safety measures should be taken by the athletic trainer to avoid injuries caused by scalpels, needles, or other sharp objects. Other precautions that can be employed to reduce one's risk include hand washing, using disinfectants, having proper biohazard disposal containers and avoidance of eating and drinking in the athletic training room.

TABLE 7.2. Bodily Fluids That Require Universal Precautions.

Blood
Cerebral spinal fluid
Semen
Synovial fluid
Vaginal fluid

**Any bodily fluid with blood (saliva from dental procedures)*

If the athletic trainer suspects that they have been exposed, a confidential medical examination is critical. The incident should be documented, and follow up testing and evaluation is usually required. Specific laws pertaining to confidentiality and reporting of the event are defined by each individual state.

TABLE 7.3. Bodily Fluids That Do Not Require Universal Precautions.

Feces
Nasal Secretions
Saliva
Sweat/Perspiration
Tears
Urine
Vomit

Wound Care Techniques

Wound care is common practice in athletic training. Participation in sports predisposes athletes to many types of wounds, including abrasions, lacerations, blisters, and burns. In most cases, these wounds are not life threatening. However, until they are cared for, athletes may not return to participation.

The primary goals in wound care are to:

- Avoid exposure to infectious contaminants
- Control bleeding
- Clean the wound
- Prevent infection

Avoiding Exposure

All wounds, no matter how superficial, should be considered contaminated and thus potentially infectious. Therefore, it is essential that athletic trainers adhere to the universal precautions when undertaking wound management. This is especially critical when caring for a wound that involves excessive bleeding or other bodily fluids. This is why athletic trainers commonly have latex gloves in their possession and ready to use at all times when working with athletes.

Controlling Bleeding

Controlling hemorrhage quickly is an essential skill for the athletic trainer, especially when it occurs during game participation. Bleeding can be arterial, venous, or capillary in nature. In all cases, the athletic trainer should perform the following steps to ensure quick resolution of active bleeding:

1. *Direct pressure:* Pressure is applied directly over the bleeding wound. This is usually accomplished by the athletic trainer donning latex gloves and using a sterile gauze pad while applying firm, direct pressure to the center of the wound. In some cases, the athlete can be directed to do this while the athletic trainer prepares to care for the wound further.
2. *Elevation:* Elevation, in combination with direct pressure, can assist in reducing hemorrhage (slow bleeding) by reducing hydrostatic blood pressure and facilitating venous and lymphatic drainage. Elevation means raising the injured area above the level of the heart.
3. *Pressure points:* In instances where bleeding is not reduced through the application of direct pressure and elevation, utilization of pressure points has been found to be helpful. Eleven distinct pressure points have been identified in the literature, but the femoral and brachial arteries are the most commonly utilized. Pressure points will slow the flow of blood to all areas distal to the point of arterial compression. The athletic trainer should be efficient at finding the appropriate pressure point proximal to the wound and applying enough pressure to occlude or close that artery.

Cleaning the Wound

In order to clean a wound, the athletic trainer should begin by thoroughly flushing the area with soap and water. In some cases, debridement of the wound area may be necessary to remove dirt or other possible contaminants. After applying latex gloves, the athletic trainer should apply a cleansing solution to the sterile gauze pad or directly to the wound, then clean the wound from the inside outwardly. Never brush/rub from the outside margins of the wound into the wound, as this may carry contaminants into the wound that were not previously present. Once all foreign material (dirt and/or germs) is removed from the wound, you can dress the wound. In most cases, successful wound management can be handled in the athletic training room. However, large lacerations, punctures, or avulsions should be referred to a physician where further care (such as sutures or "stitches") may be provided.

Preventing Infection

After the wound has been cleansed, an occlusive dressing saturated with an antiseptic or antibiotic should be applied. However, if the wound needs to be evaluated by a physician it should be left dry. Occlusive dressings are air and watertight dressings that include semipermeable films, hydrogels, hydrolliods, foams, antimicrobials, and Vasoline® gauze. When occlusive dressings are not available, a traditional bandage may be applied with some form of antibiotic

ointment added to the bandage before applying it to the wound. All wounds should be reevaluated daily to be certain that no infection has occurred. If infection does occur, the athlete should be referred to a physician in the event that oral antibiotics are indicated. Some common open wound types and how to care for them are offered in Table 7.4.

TABLE 7.4. Wound care examples.

Blister Care:

1. Clean the area around the blister and the blister itself with antiseptic solution, such as povidone iodine.
2. Patience – let all blisters remain self-contained for at least 24 hours; do not open or drain a blister that contains blood.
3. If the blister is large and painful for the athlete, use a small sterile needle to puncture the blister for draining, or make a small incision according to your team physician's protocol.
4. Gently squeeze out the clear fluid, leaving the roof of the blister intact.
5. Clean the area again using antiseptic solution.
6. Pad the blister with a donut pad, Second Skin, or New Skin type of material.
7. Bandage the blister site prior to returning to play.

Abrasion Care:

1. Flush the abrasion with water and soap or saline solution to remove visible debris. Soft gauze may be necessary to move debris from wound.
2. Clean the abrasion thoroughly with antiseptic solution, being careful to not wash debris from outside of the wound into the wound.
3. Bandage the abrasion completely and securely before returning to play.

Lacerations or Post-Surgical Incisions Requiring Steri-Strips:

1. Clean the area around the laceration and the laceration itself with antiseptic solution.
2. Using pre-made adhesive swabs OR spraying tape adherent to a cotton swab, apply the adherent on each side of the wound, getting as close to the wound as possible, but not getting the adherent into the wound itself. These adherent areas are where the Steri-Strips will stick.
3. Cut the Steri-Strips to the appropriate length prior to removing their backing.
4. Beginning in the center of the length of the wound, remove the backing and stick one edge of the Steri-Strip to one side of the wound on the adhesive area.
5. Pull the Steri-Strip across the wound only enough to exactly approximate the edges of the wound, before sticking the other end of the Steri-Strip to the opposite adhesive area. This will help hold the wound edges together for better healing.
6. Repeat this Steri-Strip application process, being sure to pull in the same direction across the wound with each Strip, until the wound edges are exactly aligned and touching for the full length of the wound.
7. Cover the wound area with a sterile, non-stick dressing. Do not use antibiotic ointment or any other ointment, as this may cause the Steri-Strips to come loose.
8. If the wound is on the face or any other area where the athlete may not want a larger scar, then referral to a physician for sutures is warranted.

Treatment Options

Once an injury has been evaluated, the athletic trainer must provide some form of immediate treatment to the injured area. If the injury is simply a superficial wound as described above, cleaning and dressing the wound may complete the immediate treatment for that day. If there is no superficial wound, but rather an injury to an underlying muscle, tendon, ligament, or other tissue(s), the athletic trainer has many options for immediate treatment, as described below.

RICES

When an injury occurs, the athletic trainer must decide what the proper treatment protocol should be. In the case of most acute injuries, the RICES principal is most applicable. The "R" refers to *rest*, suggesting that the athlete not undertake activties that would exacerbate the injured area further. The "I" stands for *ice*. Ice refers to the application of any number of cryotherapies, including crushed ice packs, ice cups, ice baths, or cold whirlpools. Ice packs are the most appropriate form of ice for acute injuries. The "C" refers to *compression*. The application of compression in some form might be the most important component of the RICES principle. Applying compression restricts the buildup of the edema and swelling aspects of the acute inflammatory response when tissue damage occurs. It also encourages fluids to move from the injured area back into the venous and lymphatic systems where the fluid can be reabsorbed by the body. Working in concert with compression, *elevating* ("E") the injured body part takes advantage of gravity, also encouraging lymphatic absorption and venous return. Finally, the "S" refers to *stabilization* of the injured joint. This is usually accomplished by applying a splint, brace, and/or having the athlete remain in a non-weight bearing position.

Therapeutic Modalities

The incorporation of therapeutic modalities to treat injuries is common practice in athletic training. Used as an adjunct or in concert with other therapeutic practices, modalities offer additional benefits to the healing process. Considered infrared radiation therapies, both ice and heat fall into the electromagnetic spectrum. Diathermy, low-powered lasers and electrical stimulating currents are also modalities that fall into the electromagnetic spectrum. When applied to the body's tissues, the energy emulating from these modalities is reflected, refracted, absorbed, or transmitted. It is the absorption of this energy that causes a physiological response.

Application of Cold

Cold modalities are one of the most versatile and useful therapeutic modalities available to the athletic trainer. When applied to the body, cold triggers numerous vascular, cellular, and nervous system responses. These responses have a significant impact on the inflammatory response to injury, as well reducing the perception of pain and the presence of muscle spasm. Additionally, cold reduces cellular metabolism and stimulates vasoconstriction, thus reducing the tissue's need for oxygen. In acute injuries, this mitigates the scope of the original injury by reducing the chance for secondary cell ischemia.

The specific application of ice can take many forms including ice bags, ice cups, ice or cold whirlpool, chemical ice packs, and vapocoolant sprays. When deciding on which form of cryotherapy is most appropriate, the athletic trainer must consider the following: stage of tissue healing the injury is in, the size of the treatment area, whether or not gravity is contraindicated, and the goals of the therapy. It is also appropriate for the athletic trainer to educate the athlete on the body's expected response to cold application. Athletes should understand that skin responds sensationally in a predictable manner when subjected to extreme cold (see Table 7.5).

TABLE 7.5. Skin Responses to Cold.

Stage 1: Cold sensation
Stage 2: Stinging
Stage 3: Mild burning or aching
Stage 4: Numbness

The application of cold is often integrated with exercise. This is known as *cryokinetics* and involves using cold to reduce pain and improve functional motion. The cryokinetics process begins by the athletic trainer applying enough cold to the point where the body part becomes anesthetized. It is at this point that pain-free, progressive exercises may be started. Numbness usually lasts for only 5–7 minutes, at which time, ice should be reapplied. The athletic trainer should only return to the exercises when the body part has been renumbed. Typical cryokinetics sessions include 4–5 applications of ice followed by exercise.

The athletic trainer should be cautious when applying ice to an athlete for the first time. In rare cases, a cold reaction known as Raynaud's phenomenon might occur. This is characterized by the presence of vasospasm of the superficial digital arteries and presents with skin blanching of the fingers or toes (skin pallor) followed by diminishing redness as the extremity re-warms. Other contraindications for the application of cold therapy include: impaired circulation, peripheral vascular disease, hypersensitivity to cold, skin anesthesia, infection, or open wounds (cold whirlpools or ice baths).

Application of Heat

Heat has many therapeutic benefits including reduction of muscle spasm, reduction of pain perception, increased blood flow and metabolic rate, increased collagen elasticity, and decreased joint stiffness. The athletic trainer must be diligent when choosing the appropriate form of heat and managing the correct parameters. If too little heat is applied, there will be little to no benefit to the patient. If too much heat is applied, the patient has an increased chance of a burn or tissue damage.

Thermotherapies are most often applied by way of moist heat packs, warm baths, or whirlpools. The body's physiological response to the presence of heat is noteworthy and depends on several factors. Specifically, these include the intensity of heat, the treatment time, and the distinctive tissue response. The effects of heat are associated with its absorption and the resulting increase in cellular metabolism. The physiological benefits of heat include: decreased muscle spasm, decreased joint stiffness and pain due to an increase in blood flow, increased metabolic rate, increased collagen elasticity, increased capillary permeability, and increased edema.

Proper application of heat requires the athletic trainer to educate the patient about the specific treatment, the risks involved, and the potential benefits. During the treatment, the athletic trainer must not forego frequent patient evaluation and assessment. This will ensure patient safety and maximize the benefits of the treatment. In deciding whether or not to apply heat to a patient, the following contraindications should be ruled out: acute musculoskeletal injuries, impaired circulation, peripheral vascular disease, and skin anesthesia. *Heat modalities should never be applied to any injury within the first 48 hours post-injury, minimally.*

Splinting/Bracing Techniques

After the injury evaluation and initial treatment are complete, the athletic trainer should protect the area from further damage. This can be achieved in a variety of ways using numerous splinting or bracing devices. With acute injuries, especially those involving bones and joints, splinting is often necessary before moving the athlete. There are several splints available to the athletic trainer, including rapid form vacuum splints, air splints, SAM® splints, and half-ring splints. Any one of these devices will suffice when preparing an unstable body part for transportation, for example from the field to a sideline area or from an athletic training room to an emergency room. Whatever the type of splint the athletic trainer chooses, two principles of splinting must be employed. First, the splint should be applied so that it extends beyond the joint above the fracture or injury and beyond the joint below the fracture or injury. Secondly, it is suggested that you splint the athlete in the position they are in, rather than realigning any portion of a limb or body area. Additional guidelines for proper splinting are presented in Table 7.6.

TABLE 7.6. Guidelines for Proper Splinting for a Fracture or Unstable Joint.

1. Splint the injury in the position found.
2. Be sure the splint extends beyond the joints above and below the suspected injury.
3. The splint should not allow any movement.
4. Be sure that you can assess vascular integrity via finding a pulse distal to the injury.
5. Elevate the splinted extremity if possible.
6. To reduce pain, an ice bag may be applied around the splint.

When the athlete returns to participation in their sport, it is often necessary to protect tissues that are still in the last phase of healing. There are a myriad of braces available to the athletic trainer, including commercial and custom options. Perhaps the most utilized brace in athletics is the ankle brace, which is used for both prevention and return to play protection. These types of braces support ankle motion while restricting planes of motion that could create injury. Knee braces are another common group of braces utilized by athletic trainers (see Figure 7.1).

FIGURE 7.1. Patellafemoral Sleeve with Butress.

Knee braces have a variety of different functions and are often categorized as either protective or rehabilitative. Protective knee braces are most often worn to protect the athlete from injury to the medial collateral ligament in the knee. Rehabilitative knee braces are significantly different in that the athletic trainer can restrict range of motion about the knee, while injured tissues are allowed to heal (see Figure 7.2). As the athlete progresses in his or her rehabilitation program, the brace can be altered to allow for increased range of motion. Here are some other common protective braces worn in athletics:

- Shoulder braces: For unstable glenohumeral joints, though not very effective
- Wrist braces: For a variety of tendonopathies involving the wrist
- Thumb braces: For chronically sprained thumb ligament support
- Low back braces: For a variety of injuries to the low back, providing muscular support
- Knee patellofemoral joint braces: Neoprene sleeves with foam buttresses to correct improper patellar glide through the femoral groove (see Figure 7.1)
- Knee medial collateral ligament braces: To stop valgus stresses on the ligament

FIGURE 7.2. Rehabilitative Knee Brace.

- Knee anterior cruciate ligament braces: To stop anterior translation of the tibia on the femur
- Osgood Schlatter's Disease braces: To pad the inflamed tibial tuberosity area
- Knee patellar tendonitis braces: To splint or support the patellar tendon between the tibial tuberosity and the patella
- Ankle braces: To support the medial and lateral ankle ligaments
- Aircast ankle braces: To support the ankle ligaments and the distal tibia and fibula
- Arch supports or orthotics: To support the medial longitudinal arch of the foot and to promote normal foot/ankle biomechanics that affect other lower extremity injuries

Transporting Techniques

After an athlete is injured on a field or court, and the on-field evaluation is completed, the athlete may need to be helped off the field. This may include supporting them while they walk, putting them onto a spine board, or any type of transportation carry in between. If the athlete can walk, it is usually necessary and cautionary to support the athlete. This technique is best accomplished with two individuals who are of similar height to the athlete standing on each side of the athlete. The athlete should be instructed to drape their arms over the shoulders of the individuals assisting them. In turn the individuals wrap their arms around the athlete's back. This position ensures the athlete can be safely escorted to the sideline or athletic training room for further evaluation and treatment.

Manual conveyance is another, very similar technique often used to move an athlete off the field of play. If the athlete is unable to bear weight, it will be up to others to carry the athlete to the sideline or athletic training room. It should be noted that a thorough evaluation must be conducted before this technique is used to move an injured athlete. This technique requires carrying the injured athlete by using two athletic trainers' arms to support the athlete's back and thighs, creating sort of a chair for the athlete. The two athletic trainers lock wrists with each other both under the athlete's thighs and behind the athlete's low back. Thus, the athlete maintains a seated position. The individuals carrying the athlete should take care not to position themselves so that they become injured during the process.

When a spinal cord injury is suspected, the *only* way to move an athlete is on a *spine board* (see Chapter 3). To review, this technique involves the coordinated actions of numerous individuals. One individual, usually the one with the most medical training, stabilizes the athlete's head/neck and directs the other individuals. Two to three other individuals line up on each side of the supine athlete. The goal of team lifting is to *not* allow any movement of the spine while lifting the athlete onto a spine board. The person stabilizing the head and neck is the captain, and the one who calls out the commands, such as "1-2-3-lift" and "1-2-3-lower." The helpers are commonly positioned on the left and right of the shoulder area, on the left and right of the hip area, and on the left and right of the knee and ankle area. In concert, the athlete is lifted, moved over the spine board, and lowered onto the spine board, all while keeping the spine in a neutral position. Once on the spine board, the athlete is secured by a series of straps so that he/she is unable to move. Additionally, the athlete's head is secured to the board with the assistance of a neck collar and/or supporting bolsters. On command, the spine board (and athlete) is then lifted by the individuals and transported for further evaluation and treatment, most commonly by ambulance.

Ambulatory Aids

After an athlete sustains an injury, it may be contraindicated for the athlete to bear weight. In this case, an ambulatory aid may be in order. Crutches and canes can assist the athlete in walking while offering protection from further injury. Before an athlete is issued a pair of crutches or a cane, proper fitting must be performed by the athletic trainer. Adjustable aluminum crutches are easy to modify to fit the athlete. Care should be taken to inspect the crutches, making sure that they are free from defects. The crutch and cane tips should not be worn through and should have adequate grip on them. In order to assure a proper fit, the athlete must maintain good posture, standing with feet together. The athlete should be wearing low-heeled shoes. An improper fit or failing to adhere to the correct body position during fitting could cause the athlete additional pain and discomfort. Here are some specific instructions for properly fitting an athlete with crutches or a cane:

Fitting crutches

- Position the tip of the crutch 6 inches from the outside of the shoe and 2 inches in front of the shoe.
- The top of the crutch should be 1 inch (Approximately two to three fingers width) below the armpit.
- There should be a 30° angle at the elbow when adjusting and placing the hand grips.

Fitting a cane

- Cane should be level with the superior aspect of the greater trochanter (hip).
- Cane should be held on the opposite side of the body from the injury site.

Once the ambulatory aid is properly fitted to the athlete, the athletic trainer should demonstrate ambulation. There are various ambulation methods the athlete can use with crutches. The tripod or three-point gait method is the most commonly utilized. This gait pattern is efficient and effective for an athlete who needs to maintain a single leg or foot in a nonweight bearing position. If the athlete requires support for both lower extremities, a four-point gait pattern is indicated. This pattern resembles a four-legged approach to walking that is similar to a person using a walker. If indicated, and the athlete is able, partial weight bearing can be achieved through the use of a single crutch or cane. If the athletic trainer observes that the athlete is concentrating too much weight on the single crutch or cane, two crutches should be used. Following are specific instructions for each gait pattern:

Walking with Crutches or Cane

Tripod method or three-point gait

1. Stand with the injured leg elevated or partially bearing weight.
2. Place crutches 12 to 15 inches ahead of the feet. Be sure crutch tips are not too far out to the sides.
3. Lean forward, straighten elbows, pull the body forward until the crutch is against side.
4. Swing body through the stationary crutches, placing the uninjured leg in front of the crutches. Be sure not to lean body weight on the armpits. Recover crutches and place crutch tips 12–15 inches in front of body. Repeat.

Four-point gait This method is used when walking with two crutches or a cane. The cane and the injured leg should move together, followed by the uninjured leg.

1. Stand with weight on both feet.
2. One crutch is moved forward and the opposite foot is moved forward.
3. The opposite crutch is then moved forward, followed by the other foot. Repeat.

Stair climbing

1. Going up stairs: First move the uninjured leg up one step. Follow with the crutches and the injured leg to the same step. Repeat.
2. Going down stairs: First move the injured leg and the crutches down one step. Follow with the uninjured leg to the same step. Repeat - using great caution to keep center of gravity back to avoid falling forward down the stairs!
3. If a handrail is available, both crutches may be held in the outside hand, and the same pattern is used as above.

Referral to Another Health Care Specialist

Athletic trainers are highly trained health care professionals that are charged with the well being of the physically active. Providing such holistic and comprehensive care for athletes requires a multidisciplinary team approach. It would be unrealistic to think that a single health care provider has the expertise to oversee every aspect of the athlete's care. Therefore, a team approach is preferred in which the members coordinate and plan activities that support the general physical and mental health of the athlete. The sports medicine team approach, utilizing a variety of health care professionals, is discussed in Chapter 1. Concerning this chapter, once the initial evaluation and treatment have occurred for an injured athlete, there is commonly a need

to refer the athlete to another member of the sports medicine team. For example, if a basketball athlete has a severely sprained ankle with a possibility of an avulsion fracture, the athletic trainer would need to refer that athlete to a physician to obtain X-rays or other tests deemed appropriate by the physician. Or perhaps a crew rower is evaluated, and a stress fracture of the femur is suspected, along with disordered eating. This athlete should be referred to a physician to care for the potential stress fracture, while also being referred to a psychologist or psychiatrist for assistance with the potential eating disorder. In any event, the athletic trainer should use referrals to other health care providers liberally, adhering to their scope of practice.

The Referral Process

In some situations, the athlete may require medical care outside the scope of practice of the athletic trainer. This proper care of the athlete may require the athletic trainer to refer the athlete to a health care specialist. The choice to refer is often a decision made by the athletic trainer in concert with the team physician. It benefits the athletic trainer to have familiarity with the local medical support services in the community or on the school campus. In addition, the athletic trainer should have a basic understanding of the insurance referral procedures and billing practices. In many instances, the insurance provider may have a preferred provider referral list that differs from the athletic trainer's list. Whenever possible, open lines of communication should be established between the athletic trainer and the health care specialist the athlete was referred to, within HIPAA regulations (see Chapter 2). All referrals should be documented in the athlete's file, along with any results from those referrals.

Summary

One of the primary roles of the certified athletic trainer is providing immediate care to an injured athlete. Immediate care can include wound care, treatment with ice or other modalities, splinting and bracing, transporting or ambulatory aid use, and referral to other health care providers. When addressing a bleeding wound, the athletic trainer must be conscious of the potential risks involved. Following OSHA guidelines and using universal precautions is the best way to reduce the potential transmission of infectious bloodborne pathogens. Using universal precautions means utilizing appropriate barriers (gloves, masks, gown, eye protection) to prevent your skin and mucous membranes from coming into direct contact with an athlete's blood or bodily fluids. In some situations, the athletic trainer may be required to stabilize an injury involving a fractured bone or unstable joint. Besides being able to assess and recognize these types of injuries, athletic trainers must be familiar with proper application protocols for splints and braces. Spine boards, cervical collars, and vacuum splints are common splinting devices the athletic trainer should be familiar with. Finally, when an athlete is injured, referral to another health care specialist is often necessary for additional evaluation or services.

Sources Cited & Must Read List:

1. Occupational Safety and Health Administration: **http://www.osha.gov/**
2. Centers for Disease Control and Prevention: **http://www.cdc.gov/**
3. National Safety Council: **http://www.nsc.org/**
4. National Athletic Trainers' Association Position Statements: **http://www.nata.org**
5. National Institute of Health: **http://www.nih.gov/**
6. Federal Department of Health and Human Services: **http://www.hhs.gov/**

LAB #4 Wound Care—OSHA Standards: Cold/Heat Treatments

Name ..... **Date** .....

The objective of this portion of the lab is for each participant to understand how to clean and cover an abrasion following OSHA standards. You will be taught how to apply and remove latex gloves appropriately. If any participant has a latex allergy, please notify your lab instructor.

Appropriately cleanse and cover the abrasion on your partner's proximal, posterior medial forearm.

Remember to always:

- ☐ Wash your hands before putting on latex gloves.
- ☐ Put on latex gloves when dealing with an open wound.
- ☐ Keep sterile gauze pad sterile.
- ☐ Cleanse wound from the inside out with a circular motion.
- ☐ Apply a topical antibiotic in a sterile fashion.
- ☐ Cover the wound.
- ☐ Use sterile techniques when removing your latex gloves.
- ☐ Dispose of hazardous waste in the proper containers.
- ☐ Wash your hands properly after cleansing an open wound.

Cold and Heat Treatments

You will learn indications for heat vs. cold applications with further studies in Athletic Training. The objective of this portion of the lab is for you to experience the following modality techniques first hand. Each lab participant is expected to take part.

- Apply ice bag to your partners' ankle for 15 minutes with compression wrap (You can both do this at the same time!)
  What sensations did you experience?

  Initially?

  After 5 minutes?

  After 10 minutes?

  After 15 minutes?

- Apply heat pack to thigh for 15 minutes (You can both do this at the same time!)
  What sensations did you experience?

  Initially?

  After 5 minutes?

  After 10 minutes?

  After 15 minutes?

LAB #5 Splinting and Use of Ambulatory Aids

Name ..... **Date** .....

The objective of this lab is for you to learn how to appropriately splint an injured body part, fit someone for crutches, and to teach someone how to use crutches. All are expected to participate. Please pair up with a partner.

Splinting

Basic principles:

1. Splint in the position found. Do not attempt to reduce a fracture or change the position of the joint.
2. Check the circulation distal to the suspected fracture site before splinting.
3. Immobilize the joint above and below the suspected fracture site.
4. Be careful to move the limb as little as possible.
5. Re-check circulation distal to the suspected fracture site after splinting.

Scenarios:

1. Splint a dislocated elbow using the vacuum splints.
2. Splint for a suspected tibia fracture using the vacuum splints.
3. Splint for a suspected radius fracture using the Sam Splint.

Use of Ambulatory Aids

Fitting crutches:

1. Position the tip of the crutch 6 inches from the outside of shoe and 2 inches in front of the shoe.
2. The top of the crutch should be 1" (Approx. 2–3 fingers width) from the armpit.
3. There should be a 30° angle at the elbow when adjusting the height of the hand grips.

Fitting a cane:

1. Cane should be level with the greater trochanter.
2. Cane should be held on the opposite side of the body from the injury site.

Walking with crutches or cane:

Tripod method or three-point gait

1. Stand with the injured leg elevated or partially bearing weight.
2. Place crutches 12 to 15 inches ahead of the feet. Be sure crutch tips are not too far out to the sides.
3. Lean forward, straighten elbows, pull body forward until the crutch is against side.
4. Swing body through the stationary crutches, placing the uninjured leg in front of the crutches. Be sure not to lean body weight on the armpits. Recover crutches and place crutch tips in front of body. Repeat.

Four-point gait:

This method is used when walking with two crutches or a cane. The cane and the injured leg should move together, followed by the uninjured leg.

1. Stand with weight on both feet.
2. One crutch is moved forward and the opposite foot is moved forward.
3. The opposite crutch is then moved forward, followed by the other foot. Repeat.

Stair climbing:

1. Going up stairs: First move the good leg up one step. Follow with the crutches and the bad leg to the same step.
2. Going down stairs: First move the bad leg and the crutches down one step. Follow with the good leg to the same step. Be careful to keep your center of gravity from falling forward!
3. If a handrail is available, both crutches may be held in the outside hand, and the same pattern is used as above.