



Emergency Medical Training Services

Emergency Medical Technician – Basic Program Outlines

Outline Topic: **SOFT TISSUE AND BLEEDING CONTROL**

Revised: 11/2013

DEFINITIONS

- Hemorrhage – is the loss of blood from within. Bleeding.
- Compartment syndrome – Edema to an area that makes the tissue so tight it is cutting off blood flow like a tourniquet.
- Ecchymosis – black and blue.

SKIN

- Skin is the largest organ of the body.
- Skin regulates temperature, protective barrier, detects environmental dangers (sensory nerves).
- Epidermis – dead cells.
- Dermis – hair follicles, sweat glands, sebaceous glands, nerves.
- Subcutaneous (subdermis) – fatty tissue.

Body Surface Area (BSA)

- Rules of nine – adult – Entire arm total 9%, Entire leg total 18%, Chest 9%, Abdomen 9%, Entire back 18%, Groin 1%, Entire head 9%

- Rules of nine – child - Entire arm total 9%, Entire leg total 14% (13.5% exact), Chest 9%, Abdomen 9%, Entire back 18%, Groin 1%, Entire head 18%.
- Palm Rule for BSA – Patients palm equals about 1% of BSA.

CATEGORY OF INJURIES

- Open Injuries – skin is penetrated.
- Closed Injuries – skin is intact.
- Crushing Injuries can be open or closed.
- Burn Injuries can be open or closed.

CLOSED INJURIES

- Contusion – is blood that has collected under the skin. Also known as a bruise.
- Hematoma – is a larger vessel under the skin that bleeds and more blood collects faster and raises the area.
- A contusion to the torso may indicate massive bleeding. We say that if it takes one fist to cover the contusion they lost about 10% of their blood volume.

OPEN INJURIES

- Abrasion – Shearing forces that damage the epidermal layer. Friction burn, wind burn, gravel burn (road rash).
- Laceration – Jagged cut through the skin. Cut by a device not designed to cut or cut smooth. A piece of glass, metal, jagged cutting knives, etc...
- Incision - Is a cut through the skin. Cut by a device designed to cut fine lines. Examples are scalpel, razor blades, smooth cut knives.
- Puncture Wound – Sharp, pointed objects. Needle, knife stab, gunshot.
- Amputation – Is a partial or complete removal from normal position. Must contain a bone.
- Avulsion – Is a partial or complete removal from normal position. Only contains soft tissue and no bone.
Example, ear lobe, penis, etc...
- Evisceration – Internal organs coming outside the body.

HEMORRHAGE

- Injury to deep tissues can cause severe blood loss.
- A single femur fracture can bleed 1 to 2 liters of blood.
- A pelvis fracture can bleed 2 to 3 liters of blood.
- Pelvis always can bleed more than femur when compared.

WOUND CARE ITEMS

- Dressing – Sterile layer should be first. Dressings cover the wound.
- Bandages – Material used to hold a dressing in place.
- Occlusive dressing (Non-Porous Dressing) – Does not allow air to enter. Used on all deep injuries that might suck in air. Chest injuries and neck injuries. Fastest occlusive dressing is a gloved hand.

HOW TO CONTROL BLEEDING

New recommendation for multi-trauma bleeding patients: If major trauma and major bleeding cannot be stopped with direct pressure the next step is tourniquet. If stable still follow the steps below.

- Step 1 - Direct pressure to reduce bleeding into the area.
- Step 2 - Elevate to reduce blood flow to the area.
- Step 3 - Pressure point – pressing down on major artery to the area to reduce blood flow. (brachial in arm and femoral in legs).
- Step 4 - Tourniquet – LAST EFFORT WHEN ALL ELSE FAILS. If I cut my hand off, if I do the first three steps it will take 45 minutes to bleed to death. You should be able to get to a surgeon by then. You can use a tourniquet when the body part is stuck in a machine and you cannot do the first three steps. Or you have a person shot in 10 areas of the body and you cannot plug them all. Tourniquet should be about 4 inches wide (BP cuff is a good thing), labeled as a tourniquet, time it was placed, and placed as close to wound as possible.

CLOSED SOFT TISSUE INJURY CARE

- Direct pressure if extremity, Elevate the injured area if possible, Pressure point.
- Fluff stuff – Ice for swelling, splint to reduce movement to reduce the need for blood.
- Treat for shock if severe bleeding.

OPEN SOFT TISSUE INJURY CARE

- Direct pressure, Elevate the injured area if possible, Pressure point.
- Fluff stuff – Ice for swelling, splint to reduce movement to reduce the need for blood.
- Treat for shock if severe.
- Never put bones back in, unless they go in by themselves.

OPEN CHEST WOUND CARE

- Known as sucking chest wound.
- Air can enter the plural space. Collapsing lungs.
- Transport on left side if possible.
- Think of the hole like your mouth. When you breathe in air will enter the hole. When you exhale the air will exit the hole.
- Use an occlusive dressing to cover the hole. If breathing gets worse unseal the occlusive when they exhale and seal before they inhale to let air out.

- Dressing types. Tape occlusive dressing on three sides to form a FLUTTER VALVE. By taping only three sides when the patient exhales air goes out and when they inhale the occlusive will seal. Just like the flap on a non-rebreather mask.
- Dressing types – Tape occlusive dressing on all four sides. If needed open when they exhale and close when they inhale.
- On an exam if you have to pick choose three sides (flutter) versus four sides if the choice is not both are correct.

EVISCERATION CARE

- Do not put organ back in.
- Keep from drying out and keep warm is the goal.
- Use a bulky trauma dressing and get it moist and place over evisceration. Then place dry bulky trauma dressing on top to hold in body heat.
- The use of an occlusive dressing on top is not mandatory. But might keep in more heat. (optional).

IMPALED OBJECT CARE

- Never remove. Make mound around to stabilize.
- May remove only if; through and through cheek (means that the item went in a straight line through the cheek) and can see the distal end and interferes with breathing. If breathing is ok do not remove.

- May remove only if; you need to do CPR and a knife is in the chest. Can not do compressions.
- May remove only if; the impaled object is too large to fit in the ambulance and cannot be cut down in size.

AMPUTATION CARE

- Treat patient first.
- Make sure body part goes to same facility as patient.
- EXAMPLE Finger – place finger in plastic bag and float in water and ice. The ice keeps the water cool and the water keeps the ice from freezing the finger.
- If a tooth – place in a glass of milk or care for like the finger.

NECK WOUND CARE

- Bleeds a lot. Lots of dressing needed.
- Occlusive dressing for deep cuts that might suck in air.
- Direct pressure to control bleeding is OK if needed but don't do bilateral carotid pressure. Only one side at a time.
- Transport on left side if possible.
- Air under the skin is subcutaneous emphysema. Snap, crackle, pop sound of trapped air under the skin.
- Air can get sucked into the vessels and cause air embolism (traveling clot).

BURNS (page 573) They should be in this chapter

- Superficial (1st degree) – Epidermis layer – Sunburn. Severe and life threatening if burned 70% or greater. Sun poisoning and cannot control temperature. Sunburn takes about 4 to 7 days to heal.
- Partial thickness (2nd degree) – Dermis layer – Blisters that are closed initially. So some sunburns can be 1st and 2nd. Caused by hot liquids, grease. 2 to 4 weeks healing period.
- Full thickness (3rd degree) – Subcutaneous layer – Nerves don't sense pain. 3rd degree burns hurt. It is a myth they don't. As you go away from the heat source it is a 2nd and then a 1st. 3rd degree is defined as charred, burn skin or blisters open immediately after the burn. Skin graft needed.
- Rules of nine explained above in BSA.
- What goes to burn center; burns to hands, feet, groin, chest, face, lungs. Circumferential burns (all the way around). Burns to under 5 years of age and over 55 years of age. 2nd degree burns to over 20% BSA, and 3rd degree burns to 10% BSA.

THERMAL BURN CARE

- Stop the burning if not already done.
- Protect airway.
- Remove clothing. If stuck cut around.
- Remove jewelry.

- Wrap with burn sheet or something without fibers.
- Wrap loose.
- If less than 9% BSA can soak through burn sheet bandage and dressing. If over 9% leave dry.
- Separate finger and toes if not stuck already.

CHEMICAL BURN CARE

- Brush off chemical if powder before flushing for 20 minutes.
- Flush for 20 minutes even if it feels better. You have to dilute the chemical in the pores.
- DRY LIME AND SODA ASH AND PHENOL (these chemicals will have a "w" with a line through it indicating no water) – activates with water. If the person sweats it is activated. So if the person says it burns flush with lots of water for 20 minutes to dilute. Once activated use water to flush if nothing else available per manufacturer of chemical.

ELECTRICAL BURN CARE

- Stay away unless trained. One dead person instead of two.
- Can cause small entrance wounds and larger exit wounds. Cooks them from the inside out. Like a microwave. Major internal damage. Respiratory and Circulatory collapse it likely.
- V-FIB most common after being shocked. Get AED.