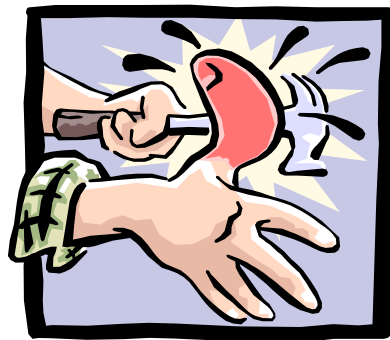


WOUNDS AND LACERATIONS

Types of Wounds

- Abrasion

- Caused by a scraping or shearing force
- Loss of epithelium and possibly dermis
- Deep abrasions similar to full thickness burns



- Contusion

- Caused by a blunt force
- Results in collection of blood (hematoma) and edema fluid in subcutaneous tissues
- May result in injury to important anatomic structures (nerve, ducts, solid organs, etc.)

- Laceration

- Injury and separation of epidermis, dermis, and possibly underlying tissues, depending on depth

- Greatest risk of damage to underlying structures, such as nerve, tendon, bone, ducts, solid organs

Principles of wound healing

- 0 – 4 hours
 - Vasoconstriction of blood vessels and clumping of platelets to control bleeding
 - Inflammatory response begins

- 4 – 48 hours
 - Fibroblasts (collagen producing cells) move into wound area, and begin to produce collagen fibers
 - New blood vessels begin to form across the space of the wound
 - Epithelial cells from edge of the wound begin to move across the surface of the wound

- 2 – 10 days
 - Collagen continues to be formed, and collagen fibers begin to contract (shorten)
 - Wound edges begin to be pulled together
 - Strength of collagen begins to increase

- 10 – 30 days
 - Formation of strong scar
 - Remodeling, shortening, and contraction of fibrous scar tissue

Wound Evaluation

1. First priority – **A**irway, **B**reathing, **C**irculation
2. Wound covered with sterile bandage until full evaluation and management can be done



3. History of injury, when possible
 - Circumstances, mechanism of injury
 - Other factors involved (burn, explosion, firearms, medications, alcohol or drug use, etc.)
 - Past medical history, especially previous injuries, current medications, diabetes, hepatitis, HIV infection, medication allergies
4. Examination of the entire patient, depending on degree of injury and risk
 - First priority – level of consciousness and mental status

- Vital signs – blood pressure (including postural changes)



- Entire body should be examined for other wounds or injuries
- Focus on functional status – use of arms and legs, walking, numbness or paresthesias, local tenderness

5. Examination of wound

- Use sterile gloves
- Evaluate extent and depth of wound
- Estimate level of bacterial contamination of wound.
- Evaluate possible damage to underlying structures – tendon, nerve, bone, solid organ, duct.
- Be very cautious with penetrating wounds such as knife, gunshot, explosion-related wounds.

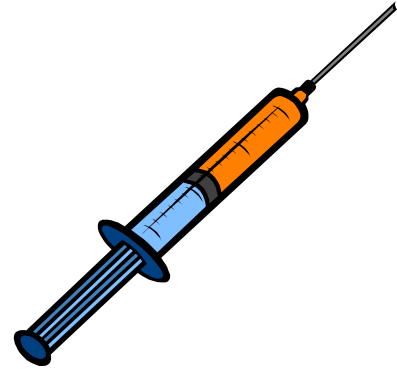
6. Decide whether wound can be managed in Health Center, or should be referred.

Consider referral of the following

- Decreased level of consciousness or change in mental status
- Possible heavy bacterial contamination of wound
- Other significant injuries associated with the wound (ie, fractures, burns, smoke inhalation)
- Evidence of damage to underlying structures such as nerve, tendon, bone, muscle, or solid organs
- Penetrating injuries such as knife, gunshot, or explosion related
- Significant loss of tissue
- Bite wound of potentially rabid animal

Wound Management

1. Tetanus prophylaxis



- Clean or lightly contaminated wounds – tetanus toxoid (or dT) 0.5 ml. IM if more than **10 years** since last tetanus immunization
- Possible bacterial contamination of wound – give tetanus toxoid (or dT) 0.5 ml. IM if more than **5 years** since last tetanus shot
- If patient has **never** had any tetanus immunizations previously - begin tetanus toxoid protocol **and** give tetanus immune globulin at the same time.
- Consider referral for rabies prophylaxis with bites of potentially rabid animals

2. Preparation of the skin

- Clip (do not shave) hair
(Studies show that shaving increased bacterial contamination of the skin, compared with clipping of hair)
- Clean wound area and wound edges with antiseptic solution such as dilute 1% povidone-iodine

3. Give local anesthesia when appropriate

- Most commonly inject 1% - 2% lidocaine (with epinephrine unless on finger or toe or tip of nose) into wound margins.

4. Debridement and Irrigation

- Remove obviously dark or dead tissue, and any foreign bodies.
- Mechanically remove dirt or embedded material with sterile gauze scrubbing
- Irrigation under pressure with large volume of saline.

Many studies show that irrigation reduces wound infections more effectively than cleaning wound with antiseptic solution

5. Close wounds with proper suture and technique, when appropriate
- **DO NOT CLOSE** the following wounds – most animal or human bites, heavily contaminated wounds, wounds older than 4-6 hours
 - Wounds with little tension can be closed with tape strips
 - Significant subcutaneous laceration should be closed with few absorbable sutures using buried knot technique
 - Skin should be closed with nylon rather than silk.

Many studies and experience shows fewer stitch infections and better healing with nylon suture. Use 5 knots in each stitch to prevent loss of sutures

- Bring skin edge to edge - Use mattress type suture in areas where skin is thin or could become inverted.
- Do not overly tighten sutures to avoid loss of circulation to skin edge

6. Dressing of the wound

- In areas of edema, mild compression (compressive bandage) may reduce edema
- Dressing should be sterile, and should be changed every 24 – 48 hours in general.
- Dressing of abrasions – sterile Vaseline on gauze helps prevent sticking of dressing to wound, change dressing every 12-24 hours. Do not allow thick eschar (crust) to form on abrasion

7. Give patient appropriate wound care instructions.

- When to return for a dressing change
- Instruct in danger signs, such as spreading inflammation or increased pain or infection, purulence, persistent bleeding
- Advise against use of home remedies to prevent scarring or infection.
- Answer questions patient may have



8. Remove sutures in 5 – 10 days

- Sutures can be removed early (5 days) in areas of good vascularity such as the face
- Sutures should be left for 7 – 10 days in areas of tension (over joints) or on lower extremities

9. Promote rehabilitation

- Encourage patient to use injured area as normally as possible, with simple dressing on exposed wounds for another 1-2 weeks
- Discuss progress of scar over next 2 years – initially raised and red, will eventually flatten and become white

