Hand Injury Treatment

Self-Care at Home

Home care for hand injuries initially involves smart first aid techniques. In most cases, serious hand injuries will require medical attention. The hand is very complex and improperly treated injuries can result in significant disabilities.

- **Lacerations (cuts)**
  - Apply pressure to the wound to stop bleeding.
  - If possible, wash dirt or debris from the wound.
  - Cover the wound to prevent further contamination or injury.
  - Do not remove large foreign bodies such as nails, hooks, or knives.
  - Seek medical attention.

- **Fractures (broken bone) and dislocations**
  - Immobilize or splint the hand, if possible.
  - Cover, if bone is exposed (open fracture), with a clean towel, cloth, or gauze.
  - Ice may help decrease the pain, but never apply for more than 20 minutes and never directly to skin.
  - Seek medical attention.

- **Soft tissue injuries and amputations**
  - Apply pressure to stop bleeding.
  - Cover with damp bandage, if possible.
  - Elevate the hand above the heart.
  - Retrieve amputated body part. If possible, cover, keep damp, and place near ice to cool. Do not place body part in direct contact with ice in order to prevent freezing.
  - Seek medical attention.

- **Infections**
  - Keep clean and dry.
  - Seek medical attention.

- **Burns**
  - Thermal (heat) burn: Cool with water, not ice, then cover.
  - Chemical burn: Irrigate with lots of water, then cover.
  - Frostbite: Rewarm with warm-water bath or soak, then cover.
  - Seek medical attention.
Medical Treatment

A general sequence of treatment for hand injuries is listed for each type of injury.

**Lacerations (cuts)**

- Evaluation of the depth or involvement of nerves, arteries, muscles, and tendons
- Local anesthesia (numb the area)
- Wound preparation - cleansing and irrigation, reexamination
- Cleaning and removal of dead tissue
- Wound repair or closure
- Dressing and splinting if necessary to keep hand from moving
- Pain medication
- Antibiotics if needed
- Tetanus shot if there has not been one in the last 5-10 years

Internal damage: Lacerations that involve tendons can be treated at a later date by a hand surgeon with good results. Therefore, an Emergency Department doctor may clean and close a hand laceration while deferring tendon repair to a specialist at a later date.

Deep cuts: Some injuries require immediate treatment in the Emergency Department or operating room. When an injury to an artery is diagnosed, a surgeon must evaluate for immediate surgical repair. If a large artery is cut, there is the possibility of massive blood loss. Death may result if bleeding is not controlled.

Bites: The main complication of bite wounds is infection. To help prevent infection bites (human or animal bites) require thorough cleansing and irrigation (washing out the wound). Puncture wounds (such as cat bites) and wounds where tissue is crushed (such as human and dog bites) are particularly likely to become infected. The risk of infection increases when these wounds are stitched, so most bite wounds need to be allowed to heal without stitches. The doctor may decide to stitch large bite wounds. Most bite wounds require antibiotics and close follow-up to assure healing.

A common cause of a human bite wound is a fight in which a punch results in a cut on the hand caused by striking the opponent's teeth. When this "fight bite" is over a joint (usually the knuckle), cleaning the joint in the operating room may be necessary. This type of injury may appear minor but can lead to severe deformity or disability even when appropriately treated.

**Dislocations and fractures**

**Dislocations**

- Evaluation to determine extent of injury
• Pain relief
• X-ray to rule out fracture and further define injury
• Local anesthesia
• If no fracture or associated laceration, reduction to put bone back in place attempted
• Reexamination
• Immobilization by splinting or budding taping
• X-ray for confirmation of correct alignment
• Follow-up with hand surgeon or orthopedist

Dislocations are the result of injuries to the ligaments around joints. In a dislocation a bone is displaced out of normal position resulting in obvious deformity, pain, and decrease in mobility. When a dislocation occurs, the doctor will evaluate the injury to ensure there are no fractures or bone breaks. Dislocated bones must be put back in place. This process is called reduction, which is the realignment of dislocated or broken bones. Reduction can be accomplished by external manipulation of the injured area (closed reduction) or by surgery (open reduction). All require follow-up care after a period of immobilization, usually with a splint or cast. The goal of treatment is to preserve the function and stability of the joint.

Splinting describes any method used to keep the injured hand or finger from moving. The doctor may place an injured hand or finger against a solid, stiff object but not inside a cast. With a splint the injured area is immobilized yet still has room to swell. A cast does not allow for swelling. A cast that encloses the injured area may be put on in a few days after swelling has decreased.

With "buddy taping" the doctor tapes an injured finger to an adjacent finger to keep the injured finger from moving. The other finger becomes a splint.

Fractures (broken bone)

• Evaluation to determine extent of injury
• Pain relief
• X-ray
• Referral for operative repair or acute reduction
• Referral for failed/inadequate reduction
• Reexamination
• Immobilization by splinting or budding taping
• X-ray for confirmation of correct alignment
• Follow-up with primary care doctor or hand specialist for severe or complicated fractures

Fractures of the hand and wrist are fairly common. Most fractures heal well if treated in a timely and appropriate manner. Some injuries may require a series of x-rays over 1-2 weeks. The small bones and complex structure of the hand make some fractures
difficult to detect. The treatment of fractures depends on a number of factors including the severity of the crack or break, whether joints are involved, the location of the specific bone injured, the amount of deformity (displacement), and if there is a laceration (cut) associated with the fracture.

Children's bones are still growing and so are susceptible to fractures involving the soft areas where the bone growth is actually occurring (growth plate). Some of these growth plate injuries are difficult to diagnose because they do not show up on x-rays. Injuries near the growth plate areas of a child's hand therefore may need to be treated as fractures (breaks) even with normal x-rays.

Treatment of a recent fracture rarely includes an enclosed cast. Fractures and other injuries that require immobilization are often splinted on one side to prevent compression injuries from a cast that goes around the whole hand. A splint allows room for the swelling associated with acute injuries, which may prevent the loss of adequate circulation or nerve injury. Splinting does not entirely eliminate the possibility of this complication. Anyone who experiences numbness, color change, or the feeling of tightness after splint application should return to the doctor.

**Soft tissue injuries and amputations**

- Preserve amputated body part
- Evaluation to determine extent of injury
- Pain relief
- X-ray to rule out fracture and further define scope of injury
- Referral to hand surgeon for repair

These injuries can be devastating to the hand. Reattaching (replantation) is difficult and even if successful may cause long-term problems with pain and infection. Situations when a surgeon may attempt replantation are amputation involving a child, thumb amputation, or amputation of multiple fingers or the entire hand. Crush or tear injuries and prolonged delay before evaluation may make successful replantation impossible. Each injury requires an immediate evaluation because each person's circumstances warrant all possibilities to be considered. The type, location, extent, person's wishes, and time of injury all contribute to the treatment plan. Some injuries will require immediate surgery for replantation. Others will require little medical intervention beyond cleansing, bandaging, and giving the injury time to heal. In some areas the doctors and facilities needed for replantation do not exist.
Infections

- X-ray if indicated
- Referral to a hand specialist if needed for extensive cleaning of the wound
- Antibiotics for inflammation of the tissue

Fingertip and nail infections may be treated in the clinic or Emergency Department with incision and drainage (if indicated), antibiotics, and close follow-up. A major consideration for an infection in the hand is the presence of a fluid collection or an abscess. If the infection is isolated to the skin, known as cellulitis, treatment involves antibiotics and close follow-up. However, an abscess requires drainage (sometimes known as "lancing"). If the abscess is large or near nerves, arteries, ligaments, or tendons it may need to be treated in the operating room. Hand infections have the potential for rapid progression leading to severe loss of function.

Burns

Serious burn injuries to the hand may require an evaluation by a hand or burn surgeon. Hospital admission may be required for treatment. Multiple operations including skin grafting may be needed in order to ensure the best outcome.

First-degree burn

- Cool with water, not ice
- Pain relief
- Reevaluation of depth or degree of burn
- Bandage with antibacterial ointment
- Follow-up in 48-72 hour

Second-degree burn

- Cool with water, not ice
- Pain relief
- Reevaluation of depth or degree of burn
- Sterile rupture of blisters
- Bandage with antibacterial ointment
- Close follow-up in 48-72 hours

Third-degree burn and deep second-degree burns

- Cool with saline or water, not ice
- Pain relief
- Reevaluation of depth or degree of burn
- Sterile dressings with antibacterial ointment
Referral to doctor skilled in burn treatment for evaluation and debridement within 24-48 hours of injury (Debridement is the process of removing dirt, foreign bodies, and dead tissue from a wound. This procedure could involve washing, scrubbing, and cutting away of dead tissue.)

Chemical burn

- Treatment tailored to type of chemical, most require lots of irrigation with water
- Certain exposures require immediate debridement. In some burns, water is not used because it further damages the skin
- Local wound care

Electrical burn

- Local wound care
- Evaluation for electrical injury to other organ systems
- If severe: intravenous fluids, cardiac monitoring

Cold injury

- Rapid rewarming of tissue with warm water (104-108°F) for 15-30 minutes
- Sterile incision of blisters
- Ointment plus sterile dressings
- Pain relief
- Consideration for antibiotics
- Local wound care with follow-up in 48-72 hours

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- When to Seek Medical Care
- Exams and Tests
- Next Steps
- Prevention
- Outlook

For more information, read the complete article, Hand Injuries on http://www.emedicinehealth.com.

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