

Type of traumatic wounds:

1. Tidy (Sharp Injuries). e.g. Sharp objects cause cut, incised, and puncture wounds. Common causes are knives and glass. Regular wound edges Clean. Contain no devitalized tissue.
2. Untidy (Blunt Injuries) e.g. contusions, abrasions, lacerations, Irregular wound edges Contaminated, Contains devitalized tissue and May have tissue loss. Such wounds need wound excision (debridement, wound toilet) before wound closure.
3. Degloving injuries: Degloving is caused by shearing forces that separate tissue planes, rupturing their vascular Interconnections and causing tissue ischemia. This most frequently occurs between the Subcutaneous fat and deep fascia. Similar injuries occur as a result of run over road traffic accident injuries where friction from rubber tyres will avulse skin and subcutaneous tissue from the underlying deep fascia. Extensive skin necrosis can occur. Types: Degloving injuries can be open or closed.
4. Gun shot /blast injuries: Can be classified as low and high velocity.

- Low-velocity injuries, 400m/s, such as from a hand gun, causing limited damage along the tract of the missile. Such injuries are often associated with severe tissue contamination from clothing, dirt or other foreign materials.

- High-velocity injuries, 1000m/s, from modern assault rifles, cause explosive pressure and decompression effect, such that there is widespread tissue damage and cavitation, with injury to major limb vessels and nerves situated some distance from the tract of the missile.

Important notes:

- Gunshot wounds and war wounds should be left open.
- Following high-velocity injuries, fasciotomy of all of the fascial compartments of the limb should be undertaken.

ABNORMAL WOUND HEALING

Chronic wounds can be defined as a loss of continuity of the skin secondary to injury that persist for longer than 6 weeks.

Abnormal wound healing: the imbalance between (scar formation) attempts to replace tissue defects with new substitute tissues against (regeneration) the re-creation of the original tissue in situ. It is also helpful to determine where within the normal phases of wound healing the problem occurs. a corneal ulcer, which represents a defect in epithelial regeneration, growth factor therapy would make sense to augment the potential for regeneration, whereas it would make less sense for a defect such as a peripheral neuroma. For a neuroma, treatments aimed at preventing nerve regeneration.

Inadequate Regeneration:

central nervous system injuries bone nonunion and corneal ulcers.

Inadequate Scar Formation

Diabetic foot ulcers, sacral decubiti, and venous stasis ulcer

the scar formation defects further subdivided whether the primary defect occurs in the inflammatory, proliferate, or remodeling phases of wound healing. diabetic ulcers occur because of defects in the inflammatory and proliferative phases of wound healing. In contrast, wounds occurring because of vitamin C depletion (i.e., scurvy) are due to abnormal collagen cross-linking, which occurs during the remodeling phase of wound healing.

Excessive Regeneration:

Relatively rare. In these cases, there are functional problems in reintegrating the tissue into the systemic physiology. Examples: neuroma occur in peripheral nerve like tissue, hyperkeratosis that occurs in cutaneous psoriasis or granuloma formation in healing wounds.

In these disease states, therapeutic measures are targeted toward decreasing cellular proliferation and blocking or impeding the aberrant regenerative pathways. Irritant strategies to maximize scar formation may also play a role, as when alcohol is injected into a neuroma.

Excessive Scar Formation:

Examples: Pulmonary fibrosis or cirrhosis and Excessive" cutaneous scar formation which is either hypertrophic scarring or keloid formation.

Features	keloid	hypertrophic scarring
Race	black and Asian populations	Not race related
Genetic	have a genetic component that limits them to <6% of the population	Not familial
Sex	Female > male	Female = male
Age	10-30 years	Children
Borders	overgrowth of dense fibrous tissue beyond the borders of the original wound	do not extend beyond the original wound margins
	Less risk of contractures	more prone to forming disabling contractures
Site	Sternum, shoulder, face	Flexor surfaces
Natural history	Rarely subsides	Subsides with time
Etiology	Unknown	Related to tension

Treatment of hypertrophic and keloid scars

- Pressure – local molds or elasticated garments
- Silicone gel sheeting (mechanism unknown)
- Intralesional steroid injection (triamcinolone).
- Excision and steroid injection.
- Excision and postoperative radiation (external beam or brachytherapy)
- Intralesional excision (keloids only)
- Laser – to reduce redness (which may resolve in any event)

- Vitamin E or palm oil massage (unproven)

Note: All excisions have high rates of recurrence > 75 %.

FACTORS THAT CONTRIBUTE TO WOUND HEALING IMPAIRMENTS

Age

Ischemia Reperfusion injury

Infections or bacterial bio burden

Malnutrition

Foreign bodies

Diabetes

Steroids

Uremia and jaundice Cancer

Genetic causes (e.g., Ehlers-Danlos, Werner syndromes)

Irradiation Chemotherapy

Tobacco use Alcohol use

Edema

Pressure

BASIC FUNDAMENTALS OF WOUND CARE

- **Optimize systemic parameters**
 - Nutrition
 - Glucose control
 - Smoking cessation
- **Debride nonviable tissue**
- **Reduce wound bioburden**
- **Optimize blood flow**
 - Warmth
 - Hydration
 - Surgical revascularization
- **Reduce edema**
 - Elevation
 - Compression
- **Use appropriate dressings**
 - Moist wound healing
 - Exudate removal
 - Avoidance of trauma to wound or patient
- **Use pharmacologic therapy when necessary**
- **Close wounds surgically with grafts or flaps as indicated**