



# First Responder Accreditation

Topic 11:

Assessment and management of wounds

## Acknowledgements

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## Introduction

This module aims to give members knowledge of best practice in wound care. Wounds are one of the most common presentations that St John personnel deal with during an event. Wound care is more than just stopping bleeding and applying a dressing. Excellent wound management requires an understanding of different wound types, their causes and normal healing process as well as factors that may impact on healing. Wound management involves both assessment and treatment followed by a referral processes and discharge advice. Choosing the correct dressing is important in the healing process.

## What is a Wound?

A wound is a break in the continuity and integrity of the skin. The skin is the body's largest organ and plays an important role in protecting the body against infection. It performs a number of important functions including those listed below.

- The skin acts as a shield against injury.
- When intact, the skin protects internal organs against invasion by germs.
- The skin is waterproof and helps regulate the body's temperature.
- The skin alerts the brain to changes in the environment through skin receptors.

## Normal wound healing

Most tissues in the body heal in three phases:

1. Reaction
2. Regrowth
3. Remodelling

These steps produce a patch or a scar. In a small clean wound such as a surgical incision, most of the healing processes are quick and take only a few days. In complex wounds, healing can take weeks. In all wounds, the scar matures and becomes stronger over time.

### Reaction Phase

The first phase in wound healing is the **reaction** or inflammatory phase. It begins immediately after an injury, blood vessels constrict temporarily and blood clotting begins. During this phase local capillaries become excessively permeable, fluid flows out, and the tissues swell. The capillary permeability attracts wandering tissue cells and white blood cells. Together, the processes in the reaction phase produce local inflammation. Large wounds, such as ulcerative pressure sores or burns, do not seal during this phase.

White blood cells work hard to remove dead and dying bits of tissue, dirt, and bacteria. If the wound becomes infected with bacteria, white blood cells form pus. Open wounds may become infected as a result of micro-organisms entering the wound from the skin or air; or from germs from the object causing the injury.

Wounds are also likely to become infected if foreign matter or dead tissue remains in the wound.

After 48 hours, under healthy conditions, a second wave of white blood cells migrates into the wound. These release growth factors which stimulate the next phase of wound healing.

### Regrowth Phase

The second phase in wound healing is the regrowth phase. New cells grow into the wound and begin to lay down the collagen and other extracellular fibres that will give strength to the scar. At the same time, new blood vessels grow into the wound. Together, the newly forming cells and blood vessels are called granulation tissue.

If the granulation tissue is moist, the epithelial cells can move rapidly across the wound healing it quickly. If the granulation tissue is covered with a dry, scabby exudate, the epithelial cells migrate slowly.

The new epithelium grows along the top of the granulation tissue until the edges come together. New cells grow especially well in the low oxygen/high lactate environment of a healing wound, when it is still covered by exudate or an appropriate dressing.

### Remodelling Phase

Wounds where the edges come together (e.g. a cut or laceration) will heal faster than a wound where the skin has to grow across a wound.

The final phase in wound healing is the remodelling phase. In this phase the scar tissue contracts, swelling (oedema) disappears, and the wound continues to strengthen and to adjust to the tensions applied during day to day life. This remodelling continues for 6 to 12 months.

The new scar is weak for the first five days and most will never be as strong as the original tissues they replace.

### Factors Affecting Wound Healing

Age: The elderly heal slower than a healthy adult.

Infection: Dirty wounds, wounds with tissue loss or wounds located in areas that are easily soiled have a higher risk of infection which will affect the healing process.

Complex Medical History: People with a medical history such as diabetes, immune-suppressed patients, and patients with vascular disease will all heal slower than healthy patients.

Medications:	Medications such as those that affect blood clotting (e.g. Warfarin or Asprin) will slow the healing process.
Nutrition:	Well-nourished patients heal faster than patients who do not have a healthy food intake.
Dressing Choice:	The right dressing promotes healing.

## Selecting Wound Dressings

The correct dressing will:

- remove excessive ooze to prevent maceration of the surrounding tissue;
- allow gaseous exchange that supports new cell growth;
- provide thermal insulation;
- act as a barrier to infection;
- not cause allergies or sensitivities;
- protect against mechanical trauma, pressure and shearing;
- allow non-traumatic removal;
- be easy to apply, is comfortable, and adaptable to body parts; and
- not interfere with body function (bending joints etc.)

### Wound Dressing Principles

Dry dressings are great for covering a wound to stop bleeding, keeping a wound clean, or for a protective cover until the patient can seek medical aid for suturing etc.

Dry dressings must be changed daily or when they become soiled or wet.

Types of dry wound dressings include:

- Non- Adhesive Dressings
- Island Dressings (Primapore)
- Gauze
- Combine
- Crepe Bandage
- Dressing strip/ Steri strip

## Types of wounds

Type of Wound	Description	Caused By	Damage to the tissues
Bruise/ Contusion 	Discolouration to the outer skin accompanied by pain and swelling	Blow from something blunt	Injury caused by rupture to vessels under skin which then bleed into the surrounding tissues.
Incision/ Cut 	A straight cut with edges that oppose (comes together neatly)	Sharp object, eg knife or glass	Causes skin, soft tissue or muscles to be severed
Laceration 	A ragged edged wound, may have been torn, some tissue may be missing, edges may not oppose (come together)	Sharp and or jagged objects, e.g.: barbed wire, teeth or claws.	Injury causes damage to skin and underlying tissues
Puncture 	A penetrating wound may appear small on the surface but involve deep underlying tissues, muscles and organs. May include an exit wound.	Caused by a sharp, penetrating, high velocity object	May involve underlying tissues, muscles and organs. High risk of infection
Skin tear/ Avulsion 	A ragged edged wound with underlying tissue exposed. May have a flap attached (skin tear)	Caused by severe force	Damaged to skin and underlying tissue. High risk of infection
Graze	Superficial scraping of skin. May involve one or several layers of skin. May contain foreign objects or dirt.	Scraping across a hard surface	Injury causes outer layer of skin and tiny underlying blood vessels to be exposed.
Abrasions 	Superficial, deep or mixed. May contain foreign objects or dirt. Superficial- Removal of outer layers of skin. Minimal bleeding Deep – Removal of all layers of skin involving some underlying tissue (eg: craters) Heavy bleeding Mixed – Contains both superficial and deep.	Scraping across a hard surface	Contains both superficial Injury causes outer layer of skin and tiny underlying blood vessels to be exposed. Can include all layers of skin (as opposed to a graze), Can be mixed or deep. and deep

## **Infection prevention**

Follow standard Infection Prevention procedures when providing wound care. If the skin of the first aider is not intact germs from the patient's body fluids may enter the first aider's body. Any open non intact skin areas on the first aider should be covered and the use of disposal gloves worn. First Aid Services standard kits include adhesive transparent dressings (Opsite or Tegaderm). These are used to cover open cuts on a first aider for infection control purposes.

## *References and resources*

Australian First Aid 10/2012 pp. 189-222.

Australian Wound Management Association, *Standards for Wound Management*, West Leederville WA, Cambridge Publishing, 2010