

# Wound

[DEPTH OF BIOLOGY]

A break in the integrity of the skin; an injury to the body which causes a disruption of the normal continuity of the body structures.

[DEPTH OF BIOLOGY]

A break in the skin or other body tissues caused by injury or surgical incision (cut).

# Healing

Heal - to repair

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# WOUND HEALING

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**Wound healing is a complex, but well-coordinated process, which attempts to restore normal structure and function of the injured tissue/organ.**

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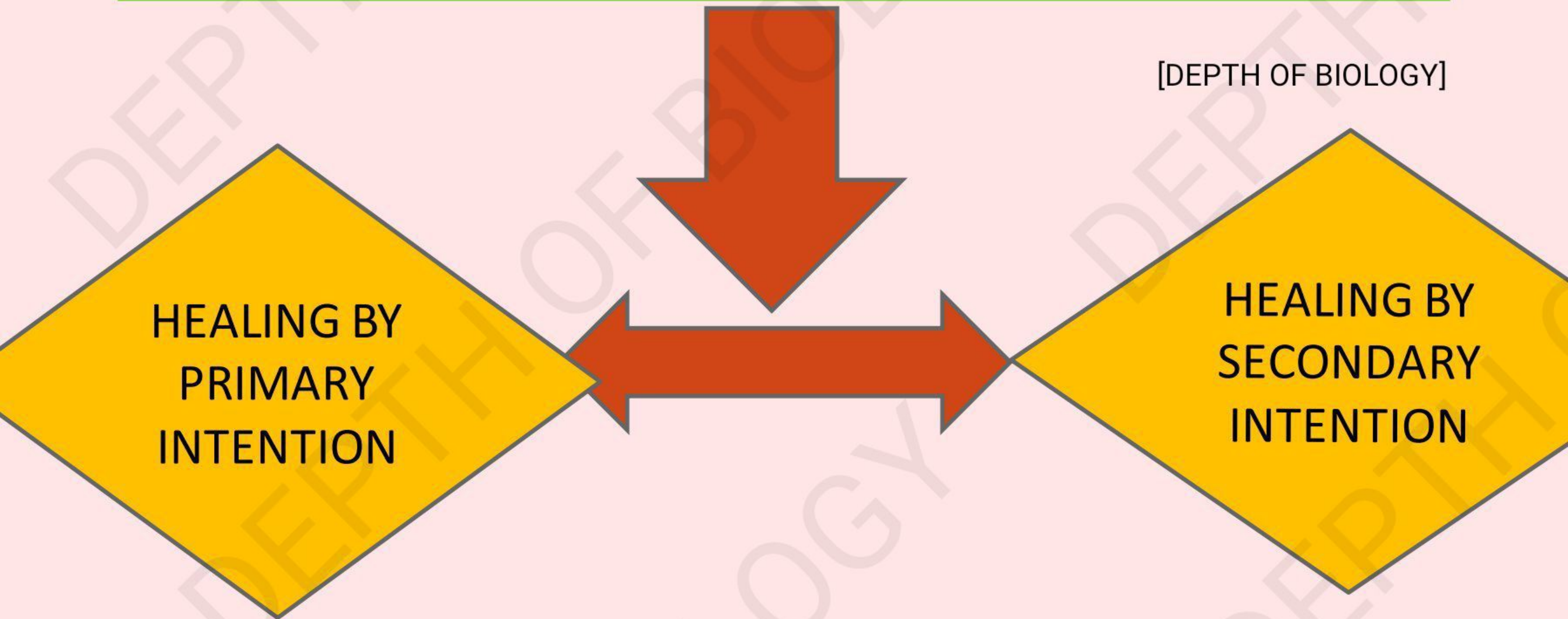
# ***TYPES OF WOUND HEALING***

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HEALING BY  
PRIMARY  
INTENTION

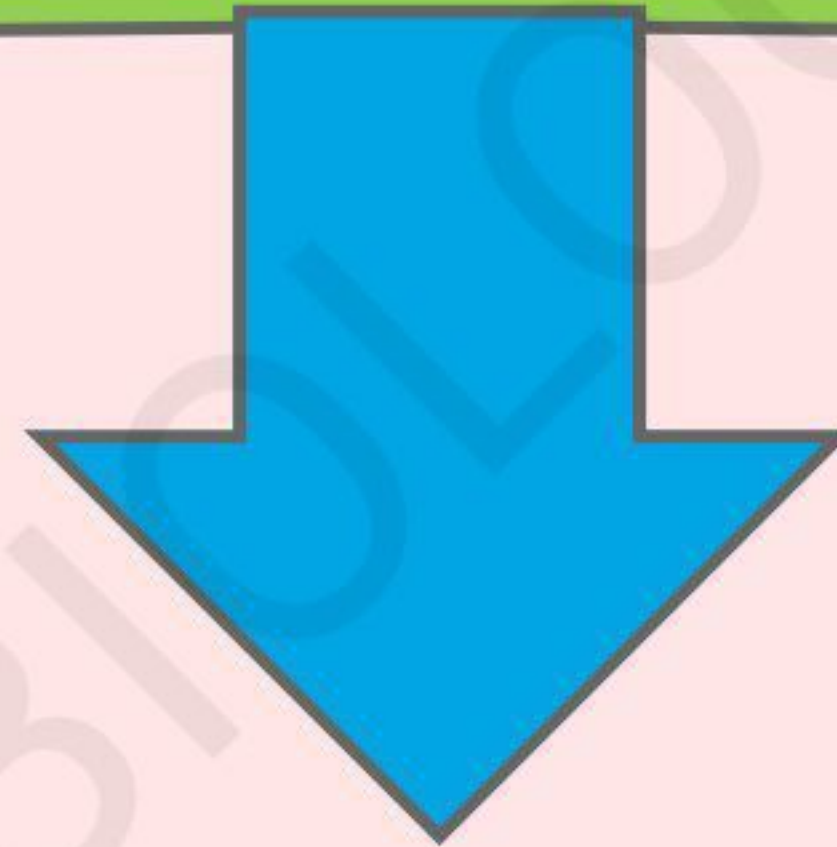
HEALING BY  
SECONDARY  
INTENTION

[DEPTH OF BIOLOGY]



# **HEALING BY PRIMARY INTENSIONS**

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- 1. Initial Hemorrhage***
- 2. Acute inflammatory response***
- 3. Epithelial change***
- 4. Granulation tissue formation*** [DEPTH OF BIOLOGY]
- 5. Organisation***

# *Healing by Primary Union or First Intention*

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Wounds with opposed edges, which are clean, uninfected and do not involve tissue loss (for example, surgical incisions or neat wounds)

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# ***1. Initial Hemorrhage***

The incised wound is filled with blood,  
which then clots the wound

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## *2. Acute inflammatory response:*

Occurs within 24 hours of the injury and is characterized by the appearance of neutrophils at the margins of the clot.

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# ***3. Epithelial change***

Within 24 hours of the injury, mitosis begins to appear in the base of the injured epithelium. [DEPTH OF BIOLOGY]

Wound is covered by epithelium within 24-48 hrs.

## ***4. Granulation tissue formation:***

By the 3rd day, granulation tissue begins to form within wound and fills the entire wound cavity by the 5th day.

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# *5. Organisation*

There occurs **marked fibroblastic proliferation** by the 2nd week leads to continuous collagen deposition.

**By the 4 weeks, the scar tissue is replaced** by adult type 1 collagen, which is responsible for the wound strength. This is followed by a complete resolution of inflammation and the wound is completely covered by intact epithelium by the 8-10 weeks.

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# **HEALING BY SECONDARY INTENSIONS**



[DEPTH OF BIOLOGY]

- 1. Hemorrhage**
- 2. Inflammatory response**
- 3. Granulation Tissue**
- 4. Epithelial Changes**
- 5. Wound Contraction**
- 6. Infections**

# *Healing by Secondary Intention*

Wounds, which are **wide open** due to extensive loss of cells and tissues, heal by secon intention. Examples of injuries, which heal by secondary intention are large gaping wounds. The healing is slow and results in a prominent scar compared to primary intention

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# ***1. Hemorrhage***

Wound space is filled with blood and fibrin clot, which dries up and temporarily fills the wound space.

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## *2. Inflammatory response:*

*The inflammatory response is much more intense* in gaping wounds than the other as the defect is large and there is more necrotic tissue debris in such wounds.

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# 3. Granulation tissue:

- The amount of granulation tissue formed in healing by second intention is much more as compared to healing by primary union. [DEPTH OF BIOLOGY]
  - Granulation is formed by **proliferation of fibroblasts** and **neovascularization**.
  - The newly formed granulation tissue ----- **fragile, granular and deep red**. [DEPTH OF BIOLOGY]
- On maturation, **scar became pale and white** due to **increase in collagen** and **decrease in vascularity**



## *4. Epithelial changes:*

- 1. Granulation tissue from base starts filling the wound space.  
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- 2. Proliferating epithelial cells cover the surface fully.

## *5. Wound contraction:*

This is the **main differentiating feature** between healing by primary intention and secondary intention. [DEPTH OF BIOLOGY]

In large gaping wounds, which heal by secondary intention there is **marked wound contraction** due to the **action of myofibroblasts**.

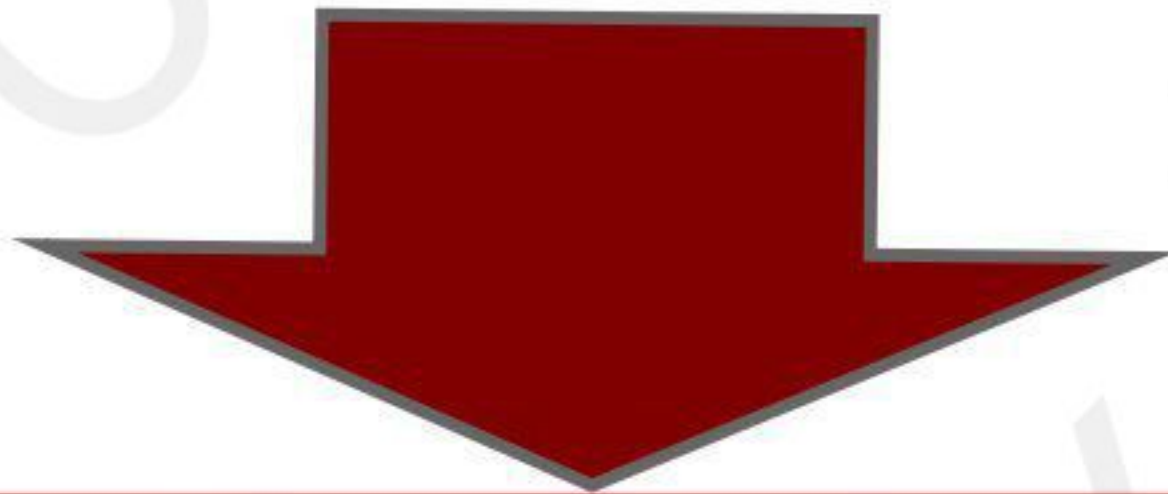
# 6. Infections

Open wounds are more prone to get infected

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This delays the process of healing due to

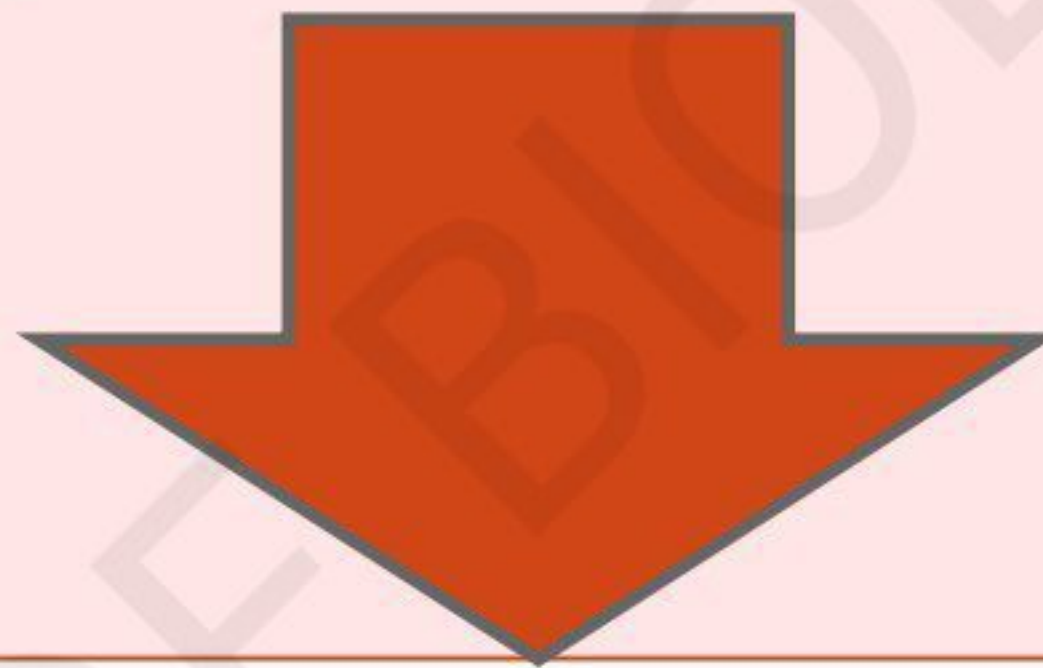
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release of bacterial toxins that  
provoke necrosis, suppuration and  
inflammation.

## Healing by tertiary intentions

[DEPTH OF BIOLOGY]



Is delayed primary wound healing after 4–6 days. This occurs when the process of secondary intention is interrupted and the wound is mechanically closed.

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- This usually occurs after granulation tissue has formed.