



# **Wound Healing & Tissue Repair**

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# Learning Ojectives

By the end of this presentation, you should be able to:

1. Define wound healing and tissue repair.
2. Describe the stages of wound healing.
3. Differentiate between primary and secondary healing.
4. Understand factors affecting wound healing.
5. Identify common complications in wound healing.

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# **Introduction to Wound Healing**

1. Definition of wound healing
2. Importance of proper healing  
for tissue function

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## **Types of Wounds**

- Acute vs. Chronic Wounds
- Open vs. Closed Wounds

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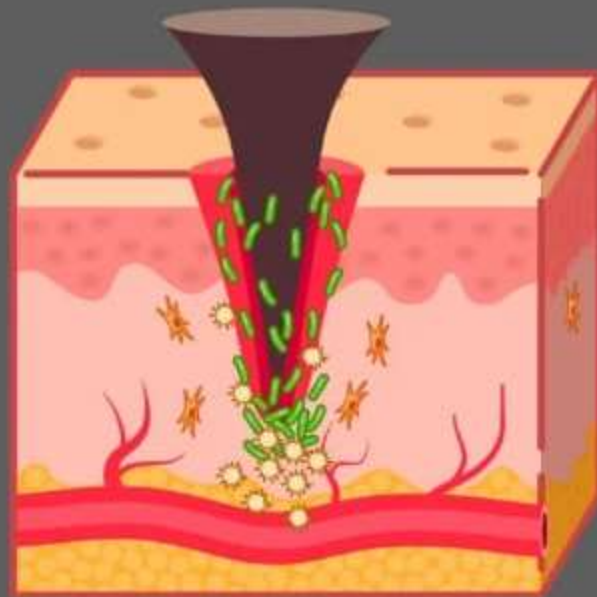
## **Phases of Wound Healing (Overview)**

- Hemostasis
- Inflammation
- Proliferation
- Remodeling (Maturation)

# 4 Stages of Wound Healing

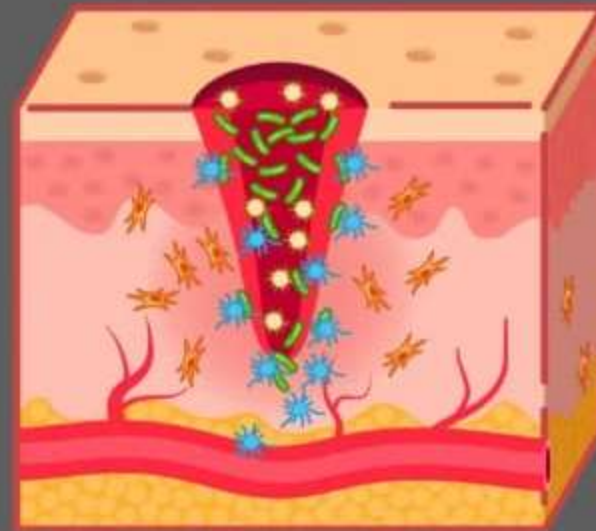


## HEMOSTASIS



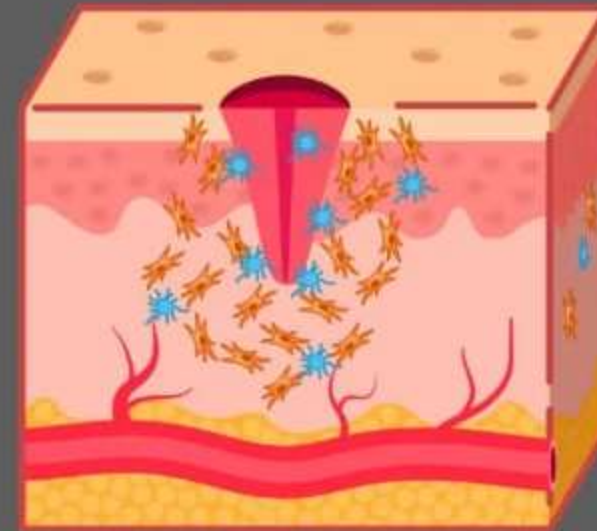
Stopping the Bleeding

## INFLAMMATION



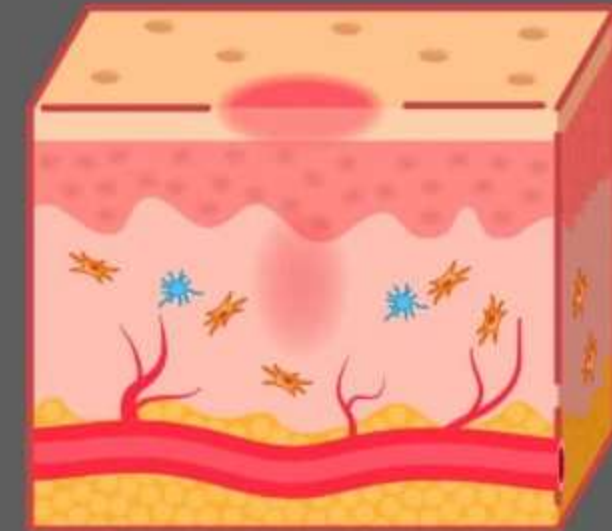
Defense & Cleanup

## PROLIFERATION



Repairing the Damage

## MATURATION



Strengthening  
the Repair

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## **Phase 1 – Hemostasis**

**1. Timeframe:** Immediate (within minutes)

**2. Key Processes:**

- Vasoconstriction
- Platelet aggregation
- Clot formation



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## **Phase 2 – Inflammation**

- **Timeframe:** 0-3 days
- **Key Processes:**
  - Neutrophils and macrophages clear debris
  - Release of cytokines and growth factors

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## **Phase 3 – Proliferation**

- **Timeframe:** 3-21 days
- **Key Processes:**
  - Fibroblast activation → Collagen synthesis
  - Angiogenesis (new blood vessels)
  - Granulation tissue formation

## **Phase 4 – Remodeling (Maturation)**

- **Timeframe:** 21 days – months/years

- **Key Processes:**

Collagen remodeling

Scar formation

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## **Types of Wound Healing**

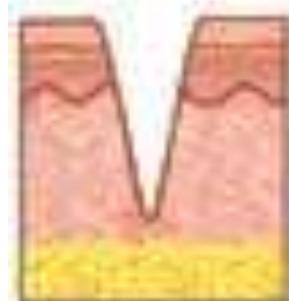
**Primary Intention:** Clean wounds with minimal tissue loss  
(e.g., surgical wounds)

**Secondary Intention:** Wounds heal from the base (e.g.,  
ulcers, burns)

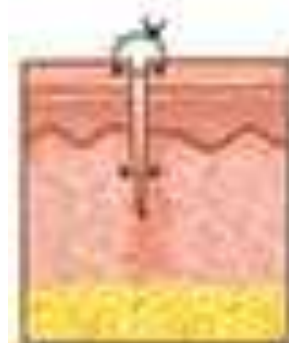
**Tertiary Intention:** Delayed closure of infected wounds

## Wound healing

### Primary intention

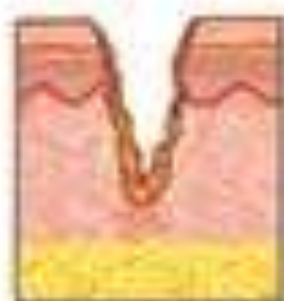


Clean incised wound/surgical wound



Wound closed by suturing, skin grafting or flap closure

### Secondary intention

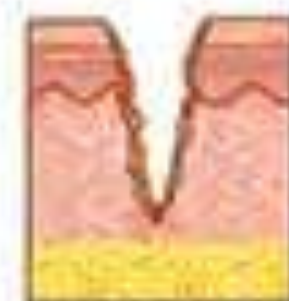


- Highly contaminated wound or tissue loss
- Wound is left open to heal

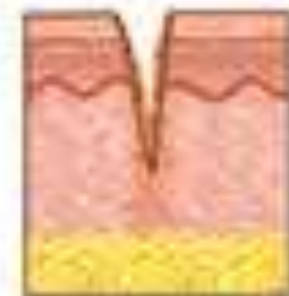


Closed by reepithelialization

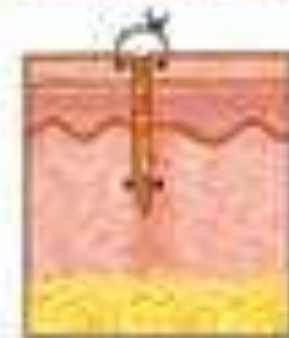
### Tertiary intention



Contaminated wound



Treated by repeated debridement



Wound is closed by suturing skin grafting or flap

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## **Factors Affecting Wound Healing (Intrinsic)**

Age

Nutrition

Immune status

Chronic diseases (e.g., diabetes, vascular diseases)

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## **Factors Affecting Wound Healing (Extrinsic)**

Infection

Medications (e.g., steroids, chemotherapy)

Oxygen supply (e.g., smoking, poor circulation)

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# Complications of Wound Healing

Infection

Dehiscence (wound reopening)

Hypertrophic scars and keloids

Chronic wounds (non-healing ulcers)



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## **Role of Growth Factors in Wound Healing**

Platelet-derived growth factor (PDGF)

Epidermal growth factor (EGF)

Vascular endothelial growth factor (VEGF)

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## **Wound Dressings & Management**

- Types of dressings (occlusive, hydrocolloids, antimicrobial)
- Debridement techniques (surgical, enzymatic, autolytic)

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## **Advances in Wound Healing**

Bioengineered skin substitutes

Stem cell therapy

Negative pressure wound therapy

## VIDEO LINK

[https://youtu.be/7qgyBZFalds?si=\\_litfHP9t96j-DHC](https://youtu.be/7qgyBZFalds?si=_litfHP9t96j-DHC)  
<https://www.youtube.com/watch?v=7qgyBZFalds>