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Wound Healing — *Process, Intentions & Stages*

A high-yield clinical map of the four stages of repair, the three intentions of closure, complications to flag, and the priority nursing judgments tested by the Next-Generation NCLEX.

SYSTEM: INTEGUMENTARY | SURGICAL & WOUND CARE | CLINICAL JUDGMENT | HIGH-YIELD NGN

📘 **Source disclosure:** Your uploaded WOUND CARE notes cover dressings, drainage, suture timing, and brief mentions of first- and second-intention healing. The phases of healing, full intentions framework, drainage progression, dehiscence/evisceration management, and pharmacology are drawn from **Saunders Comprehensive Review for the NCLEX-RN (8th ed.)**, **ATI RN Adult Medical-Surgical Nursing (12th ed.)**, **Lippincott Pharmacology for Nursing**, and **WOCN Society guidelines**.

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DEFINITION · OVERVIEW

What Is Wound Healing?

Wound healing is the body's coordinated biologic response to tissue injury — a tightly sequenced cascade that restores skin integrity, barrier function, and tensile strength. It unfolds in **four overlapping phases** and can occur by one of **three intentions**, depending on how the wound edges are managed.

Why It Matters

- Disrupted healing → infection, dehiscence, sepsis
- Identifying the *phase* drives correct dressing choice
- Drainage color tells the story of the wound

Key Facts

- Healed scar regains only **~80%** of original tensile strength
- Sutures typically removed by **day 7**
- Maximum NG suction = **25 mm Hg** for surgical patients

Core Concepts

- **Hemostasis** → Stop the bleed
- **Inflammation** → Clean the wound
- **Proliferation** → Build new tissue
- **Maturation** → Remodel & strengthen

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PATHOPHYSIOLOGY · THE FOUR STAGES

The Healing Cascade

The phases overlap in time but proceed in a predictable order. A delay or arrest in any phase = **chronic wound**.

1 Hemostasis

`0–15 minutes`

- Vasoconstriction of injured vessels
- Platelets aggregate → form plug
- Fibrin mesh stabilizes the clot
- Growth factors signal the next phase

2 Inflammation

`1–6 days`

- Vasodilation → redness, warmth, edema, pain
- Neutrophils arrive first; macrophages clean debris
- Phagocytosis of bacteria & dead cells
- **Expected — not infection**

3 Proliferation

`4–24 days`

- Fibroblasts lay down collagen
- Angiogenesis = new capillaries
- **Granulation tissue** (red, beefy, bumpy)
- Epithelialization & wound contraction

4 Maturation / Remodeling

`21 days – 2 years`

- Type III collagen → Type I (stronger)
- Scar flattens, pales, softens
- Reaches only **~80%** original strength
- Protect from sun & tension

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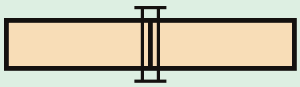
INTENTIONS OF CLOSURE

The Three Intentions of Healing

How a wound's edges are managed determines which "intention" it heals by — and the scar, time, and infection risk that come with it.

1° Primary

Primary Intention



- Clean surgical wound, edges **approximated**
- Closed with sutures, staples, glue, or steri-strips
- Minimal scar · fastest healing · lowest infection risk
- **Example:** appendectomy, lacerations sutured in ER

2° Secondary

Secondary Intention

- Wound left **open**, edges cannot be brought together
- Heals from the **base up by granulation**
- Slower · larger scar · higher infection risk
- **Example:** pressure injuries, dehisced wound, burns

3° Tertiary

Tertiary Intention

- Also called **delayed primary closure**
- Wound left open initially (infection/edema), then surgically closed
- Combines features of 1° and 2°
- **Example:** contaminated trauma wound, abdominal abscess

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ASSESSMENT · NORMAL VS ABNORMAL

Signs & Symptoms — What Are You Seeing?

✅ Expected (Normal) Healing

- Mild redness & warmth around incision (inflammatory phase)
- Slight edema in first 24–72 hr
- Pain decreasing daily
- Serous → serosanguineous drainage (decreasing volume)
- Approximated edges; intact sutures or staples
- Beefy red granulation tissue in open wounds

🚨 Abnormal — Report

- RED FLAG Increasing pain after day 3
- RED FLAG Erythema spreading > 2 cm from incision
- RED FLAG Purulent drainage (yellow/green/brown, foul)
- RED FLAG Fever > 100.4°F (38°C) after 48 hr
- RED FLAG Dehiscence — edges separate
- RED FLAG Evisceration — viscera protrude
- RED FLAG Hemorrhage / sanguineous drainage soaks dressing

Drainage Color Progression

Serous
Clear, watery plasma — **normal early healing**

Serosanguineous
Pale pink, watery — **normal first 48 hr**

Sanguineous
Bright red, fresh blood — **active bleeding (abnormal if persists)**

Purulent
Thick, opaque, yellow/green/brown, foul odor — **INFECTION** 🚨

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PRIORITY INTERVENTIONS · ABC FRAMEWORK

Priority Nursing Interventions

Airway / Breathing

- For evisceration: position **low-Fowler's, knees flexed** to reduce abdominal tension
- Splint incision with pillow during cough/deep breathing
- Incentive spirometry q1h while awake → prevents atelectasis & pneumonia

Circulation / Perfusion

- **Monitor** VS & wound q4h (more if abnormal)
- Mark expanding bloodstain on dressing with time + initials
- Assess capillary refill, edema, pulses around wound
- Hemorrhage suspected → notify surgeon, prepare to reinforce dressing

Safety & Infection Control

- **Hand hygiene** before & after every contact
- Sterile technique for dressing changes on acute wounds
- Clean from **incision outward** (clean → dirty)
- Avoid mealtime for dressing changes (odors / sights)
- Pull tape **toward the wound** to protect edges

Evisceration — Priority Sequence

- **1.** Cover exposed organs with **sterile saline-soaked gauze** — keep moist!
- **2.** Position low-Fowler's, knees bent
- **3.** Maintain NPO — surgery imminent
- **4.** Notify surgeon & obtain IV access
- **5.** Monitor for shock (↓BP, ↑HR)
- **NEVER** push organs back inside

Dressing & Drain Care Quick Hits (from your notes)

Tape Removal

Pull **toward the wound** to protect fragile incision edges. Apply **tincture of benzoin** before tape to improve adhesion & protect skin.

Penrose Drain

Advance by pulling out **1 inch**, then trim the excess. Sterile pin in new position.

Montgomery Straps

Allow dressing changes **without repeated taping** — protects skin on wounds needing frequent care.

Saturated Dressing

Bacteria reach the wound via **capillary action** — change promptly; reinforce only if hemorrhage suspected (notify HCP).

Suture Removal

Most sutures come out by **day 7**. Steri-strips may be applied after to support the incision.

Cleaning Technique

Start at the **incision** and move outward in a single stroke. New gauze for each pass. **Clean → dirty**, never the reverse.

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PHARMACOLOGY · TOPICALS & ADJUNCTS

Pharmacology for Wound Healing

Agent / Class	Mechanism	Key Side Effects	Nursing Considerations
Collagenase (Santyl) ENZYMATIC DEBRIDER	Digests denatured collagen → selectively removes necrotic tissue	Mild local erythema, transient pain at site	Apply 1× daily; **do not use with silver or iodine** (inactivates enzyme); cover with moist dressing
Silver sulfadiazine (Silvadene) TOPICAL ANTIBIOTIC	Disrupts bacterial cell wall — broad-spectrum, anti-pseudomonal	Leukopenia, rash, "pseudo-eschar" formation	Standard for **burns**; avoid in sulfa allergy & near-term pregnancy; apply with sterile glove
Mupirocin (Bactroban) TOPICAL ANTIBIOTIC	Inhibits bacterial protein synthesis — covers MRSA, Staph	Local burning, itching	Apply thin layer TID; cover lightly; nasal form for MRSA decolonization
Povidone-iodine (Betadine) ANTISEPTIC	Releases iodine → bactericidal	Skin irritation, iodine absorption, staining	For **IV site prep** (per your notes); avoid in open healing granulation — cytotoxic to fibroblasts
Becaplermin (Regranex) GROWTH FACTOR	Recombinant PDGF stimulates granulation	Erythema, possible malignancy risk with excessive use	Diabetic foot ulcers; apply thin layer, do not exceed prescribed amount
Corticosteroids (systemic) ANTI-INFLAMMATORY	Suppress inflammatory phase → **impair healing**	Delayed wound closure, immunosuppression, hyperglycemia	Anticipate slower healing; monitor for dehiscence; teach not to stop abruptly
Vitamin C, Zinc, Protein NUTRITIONAL	Collagen synthesis (C), epithelialization (Zn), tissue building (protein)	Excess zinc → copper deficiency, GI upset	Diet high in protein + Vit C & Zn; supplements if deficient; assess albumin/prealbumin
Heparin / Anticoagulants SURGICAL CONTEXT	Prevent VTE post-op, but ↑ bleeding risk at wound	Hemorrhage, hematoma, ecchymosis	Hold per protocol around dressing changes; monitor drainage color & volume closely

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NCLEX TEST TRAPS · WRONG VS RIGHT

NCLEX Test Traps ⚠

✕ TRAP	✓ CORRECT
"Push the eviscerated bowel back into the abdomen and apply a dry dressing."	Cover with **sterile gauze moistened with normal saline**; never replace organs; position low-Fowler's with knees bent; NPO; notify surgeon.
"Day 2 post-op redness, warmth, and edema = infection — call provider."	These are **expected inflammatory findings** in the first 1–6 days. Worry when they **increase after day 3**, spread, or develop fever & purulent drainage.
"Clean the wound by wiping from outside skin toward the incision."	Clean **from the incision outward** — clean to dirty, single stroke, new gauze each pass.
"Bright red drainage on a dressing 4 days post-op is normal."	**Sanguineous** drainage after the first 48 hr suggests **active bleeding**. Mark the dressing, monitor VS, notify the surgeon.
"The patient on long-term prednisone will heal at a normal rate."	Corticosteroids **suppress the inflammatory phase** → delayed healing & ↑ dehiscence risk. Anticipate slower closure and monitor closely.
"Pull tape away from the wound to remove it quickly."	Always pull tape **toward the wound** — pulling away can split fragile incision edges.
"A wet, saturated dressing left in place protects the wound."	Bacteria reach the wound through **capillary action**. Change promptly. If hemorrhage suspected → reinforce, mark, and notify HCP.

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PATIENT & FAMILY EDUCATION

Teaching for Home Wound Care

🧼 Hygiene & Technique

- Wash hands before AND after touching the dressing
- Keep wound clean & dry as ordered
- Don't pick scabs — disrupts the proliferative phase
- Shower vs bath per surgeon's order (usually no soaking)

🍳 Nutrition & Healing

- High **protein**: meats, eggs, dairy, legumes
- **Vitamin C**: citrus, peppers, broccoli — for collagen
- **Zinc**: nuts, seeds, whole grains — for epithelialization
- Adequate hydration (8 cups/day unless restricted)

📞 When to Call the HCP

- Fever > 100.4°F (38°C)
- Increasing redness, warmth, or pain after day 3
- Pus, foul odor, or new sanguineous drainage
- Wound opens, edges separate, or organs visible
- Streaks of red moving away from incision

☀️ Long-Term Scar Care

- Protect new scar from sun for 12 months (sunscreen SPF 30+ or covering)
- Avoid heavy lifting/straining for 4–6 wk post-op (per surgeon)
- Smoking cessation — nicotine = vasoconstriction = slow healing
- Glycemic control if diabetic — high glucose impairs healing

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MEMORY BOOSTERS · MNEMONICS

Memory Boosters 🧠

"H-I-P-M"

The four phases, in order:

Hemostasis → Inflammation → Proliferation → Maturation
(Heroes In Pretty Mansions)

"1° Closed · 2° Open · 3° Both"

The three intentions, decoded:

1° = closed primarily (sutures)
2° = open, granulates from base up
3° = open first, then closed later

"Color = Phase"

Drainage tells the story:

Clear (serous) → Pink (sero-sang) → Red (sanguineous = bleeding) → Yellow/Green (purulent = infection)

"Evisceration → Wet & Bent"

Two priorities you'll never forget:

Wet = sterile saline-soaked gauze on viscera
Bent = knees flexed, low-Fowler's

"Clean → Dirty"

Cleaning direction always:

From the **incision OUTWARD**, single stroke, new gauze each pass. Never re-cross the clean field.

"DIDN'T HEAL"

Factors that delay healing:

Diabetes · **I**nfection · **D**rugs (steroids) · **N**icotine · **T**issue perfusion ↓ · **H**ypoxia · **E**dema · **A**ge (older) · **L**ow protein/Vit C/Zn

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NGN CLINICAL JUDGMENT · 6-STEP NCJMM

Clinical Judgment Scenario

Case

A 68-year-old client is post-op day 4 after an open colectomy. The client has Type 2 diabetes and takes prednisone 10 mg daily for rheumatoid arthritis. While assisting with ambulation, the client coughs forcefully and reports, "Something just gave way." The nurse lifts the abdominal binder and finds a 6-cm portion of the incision separated with a glistening pink loop of bowel visible at the wound bed. VS: T 100.2°F, HR 118, BP 102/64, RR 22, SpO_2 96% RA.

STEP 1

Recognize Cues

Bowel visible at wound = **evisceration**. ↑HR, borderline BP, low-grade fever, "something gave way" + cough trigger. Risk factors: diabetes + chronic steroid use (impaired healing).

STEP 2

Analyze Cues

Evisceration is a **surgical emergency**. Tachycardia + borderline BP suggests early shock. Steroids suppressed inflammatory phase → poor tensile strength. Diabetes impairs collagen synthesis.

STEP 3

Prioritize Hypotheses

#1 priority: protect exposed viscera + prevent shock. Secondary: pain, infection prophylaxis, NPO for surgery. Tertiary: glycemic control, family communication.

STEP 4

Generate Solutions

Cover viscera with **sterile saline-soaked gauze** · low-Fowler's, knees flexed · NPO · 2 large-bore IVs · type & cross · notify surgeon STAT · OR prep · monitor VS q5–15 min · stress-dose steroids per HCP.

STEP 5

Take Action

Stay with the client. Apply **sterile saline-soaked gauze** immediately and keep moist. Position low-Fowler's, knees bent. Call rapid response/surgeon. Establish IV access. Reassure client; obtain consent for surgery.

STEP 6

Evaluate Outcomes

Effective: viscera remain moist & covered, no further protrusion, VS trend toward baseline, client reaches OR within target window, no signs of shock or peritonitis post-op.

The Single Most-Tested NGN Action

When the question stem describes **protruding viscera**, the correct first nursing action is to **cover with sterile gauze moistened with normal saline**. This option will almost always be in the answer choices alongside distractors like "push organs back in," "apply a dry dressing," or "elevate head of bed to high-Fowler's." Choose **moist + low-Fowler's + knees flexed** every single time.