

SURGICAL EMERGENCY

INTEGUMENTARY · INFECTIOUS

NGN NCLEX 2026

HIGH-YIELD

Necrotizing *Infection* TIME = TISSUE

A rapidly progressive, life-threatening bacterial infection that destroys subcutaneous tissue, fascia, and sometimes muscle. Often called "flesh-eating disease," it spreads along fascial planes up to one inch per hour and carries a 25–30% mortality rate. **Surgical debridement within hours is the only definitive treatment.**

SECTION ONE

1

Definition & Overview



What It Is

- ▶ Aggressive soft-tissue infection of **subcutaneous tissue + fascia**
- ▶ May extend to muscle (necrotizing myositis)
- ▶ Causes **vascular thrombosis** → ischemia → necrosis



Why It Matters

- ▶ Spreads up to **1 inch per hour**
- ▶ Mortality **25–30%**; higher if surgery is delayed
- ▶ Every hour without debridement increases death risk



4 Types (Microbial)

- ▶ **Type I:** Polymicrobial (diabetics, post-op)
- ▶ **Type II:** Group A Strep / MRSA — most classic
- ▶ **Type III:** *Vibrio vulnificus* (seawater, raw oysters)
- ▶ **Type IV:** Fungal (immunocompromised)

⚠ High-Risk Populations

Diabetes

Immunocompromised

IV drug use

Recent surgery / trauma

Obesity

Alcoholism

Elderly (>60)

PVD / CKD

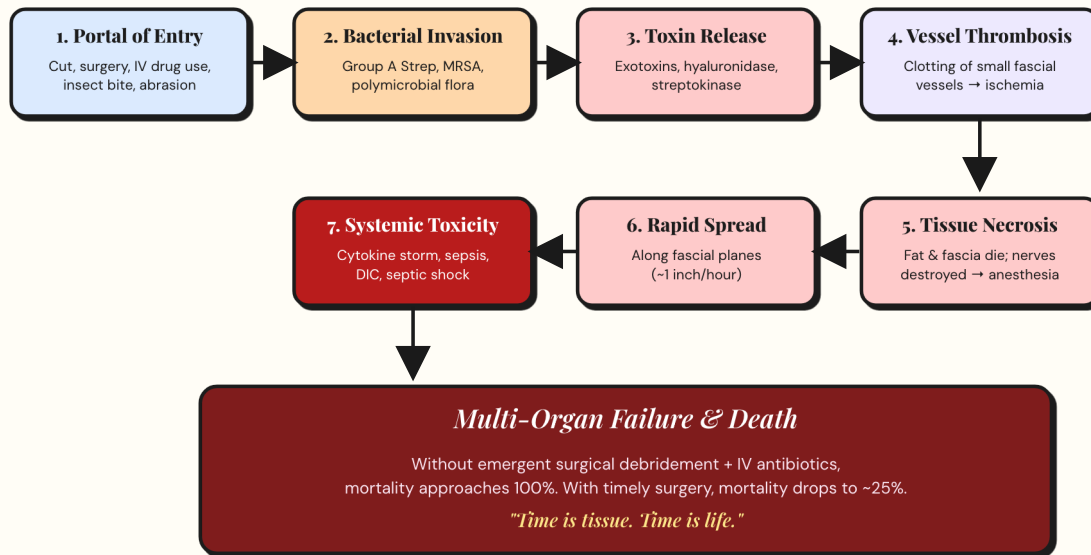
Chronic wounds

Saltwater exposure

SECTION TWO

2

Pathophysiology *Simplified*



SECTION THREE

3

Signs & Symptoms *Early vs. Late*

EARLY (Hours 0–48)

"Looks mild, feels catastrophic"

- ▶ **Pain OUT OF PROPORTION** to visible findings 🚬
- ▶ Erythema, swelling, warmth (mimics cellulitis)
- ▶ Fever > 101°F (38.3°C)
- ▶ Tachycardia, tachypnea
- ▶ Flu-like malaise, anxiety
- ▶ Skin appears normal or mildly inflamed
- ▶ Tenderness extends *beyond* visible borders

LATE (Hours 24–96)

"Tissue already dying"

- ▶ Skin discoloration: **dusky purple → bronze → black**
- ▶ **Hemorrhagic bullae** (blood-filled blisters)
- ▶ **Crepitus** (gas in tissue — palpable crackling)
- ▶ **Anesthesia** over lesion (nerves destroyed) ⚠
- ▶ Foul-smelling *"dishwater"* drainage
- ▶ Skin necrosis / sloughing
- ▶ Hypotension, AMS, oliguria → septic shock



RED FLAG — The Single Most Important Clue

Pain that is wildly out of proportion to what you see. A patient screaming 10/10 with only a small patch of redness must be assumed to have necrotizing infection until proven otherwise. **Pain that suddenly disappears is NOT improvement** — it means nerves have died and the infection has progressed.



Hemodynamic

- ▶ HR > 110
- ▶ BP < 90 systolic
- ▶ Lactate > 2 mmol/L
- ▶ Urine < 30 mL/hr



Labs (LRINEC)

- ▶ WBC > 15,000
- ▶ Na < 135
- ▶ Glucose > 180
- ▶ CRP > 150
- ▶ Cr > 1.6



Imaging

- ▶ CT: gas in tissue
- ▶ MRI: fascial edema
- ▶ X-ray: subcutaneous air
- ▶ Do NOT delay surgery for imaging



Microbiology

- ▶ Blood cultures × 2
- ▶ Wound cultures (intra-op)
- ▶ Gram stain
- ▶ Anaerobic + aerobic

SECTION FOUR

4

Priority Nursing Interventions

A AIRWAY • BREATHING

- ▶ Assess airway patency — sepsis can rapidly decompensate
- ▶ Apply O₂ to keep SpO₂ ≥ 94%
- ▶ Monitor RR, work of breathing, ABGs
- ▶ Prepare for intubation if AMS or shock

C CIRCULATION

- ▶ Establish **2 large-bore IVs** (18g)
- ▶ **30 mL/kg IV crystalloid bolus** for sepsis
- ▶ Continuous BP, HR, lactate monitoring
- ▶ Foley for strict I&O (goal ≥ 0.5 mL/kg/hr)
- ▶ Vasopressors (norepinephrine) if MAP < 65

🔪 SURGICAL EMERGENCY

- ▶ **Notify surgeon IMMEDIATELY** — definitive Rx
- ▶ NPO status
- ▶ Type & crossmatch — multiple PRBC units
- ▶ Surgical consent & pre-op prep
- ▶ Anticipate repeated debridements & possible amputation

📌 Wound Surveillance

- ▶ **Mark erythema border with marker** & time
- ▶ Reassess hourly — expansion = emergency
- ▶ Photo-document if facility policy permits
- ▶ Note crepitus, bullae, color changes
- ▶ Assess sensation (anesthesia = late sign)

💊 Antibiotics & Labs

- ▶ Draw blood cultures **BEFORE** antibiotics
- ▶ Administer broad-spectrum IV antibiotics within 1 hr
- ▶ Trend lactate, WBC, CRP, Cr
- ▶ Glucose control (esp. diabetics)
- ▶ Coag panel for DIC monitoring

🛡️ Safety & Infection Control

- ▶ **Contact precautions** (gown, gloves)
- ▶ Standard + droplet if Group A Strep suspected
- ▶ Strict hand hygiene
- ▶ Pain management (IV opioids)
- ▶ Emotional support — anticipate disfigurement, ICU



The 1-Hour Sepsis Bundle (ED priorities)

1) Measure lactate | **2)** Draw blood cultures BEFORE antibiotics | **3)** Start broad-spectrum IV antibiotics | **4)** Begin 30 mL/kg crystalloid bolus if hypotensive or lactate ≥ 4 | **5)** Start vasopressors if MAP < 65 after fluids.

SECTION FIVE

5

Pharmacology at a Glance

DRUG / CLASS	MECHANISM	KEY SIDE EFFECTS	NURSING CONSIDERATIONS
Vancomycin Glycopeptide	Inhibits cell wall synthesis (covers MRSA)	Red Man Syndrome, nephrotoxicity, ototoxicity	Infuse over ≥ 60 min; monitor trough levels (15–20), BUN/Cr, hearing
Piperacillin-Tazobactam Zosyn — β -lactam + β -lactamase inhibitor	Broad gram + / gram - / anaerobic coverage	Diarrhea, rash, hypersensitivity, $\downarrow K^+$	Check penicillin allergy; monitor renal function, electrolytes
Clindamycin Lincosamide — TOXIN INHIBITOR	Suppresses bacterial protein synthesis & toxin production (key in Group A Strep)	<i>C. difficile</i> colitis, diarrhea, rash	Monitor for severe diarrhea $\rightarrow$ <i>C. diff</i> ; always given in necrotizing strep
Meropenem Carbapenem	Extremely broad gram +/- anaerobic coverage	Seizures, rash, GI upset	Reserve for severe/resistant infections; monitor neuro status
Doxycycline Tetracycline	Covers <i>Vibrio vulnificus</i> + atypicals	Photosensitivity, GI upset, teeth staining	Avoid in children < 8 yrs & pregnancy; not with dairy/antacids
Norepinephrine Vasopressor — 1st line in septic shock	α_1 agonist $\rightarrow$ vasoconstriction $\rightarrow$ $\uparrow$ BP/MAP	Reflex bradycardia, extravasation $\rightarrow$ tissue necrosis, arrhythmia	Central line required; titrate to MAP ≥ 65 ; phentolamine for extravasation
IVIG Intravenous Immunoglobulin	Neutralizes streptococcal superantigens (toxic shock)	Anaphylaxis, headache, fluid overload, renal injury	Premed if needed; infuse slowly; monitor for AKI in elderly
Tetanus Prophylaxis Tdap / TIG	Active or passive immunity	Local soreness, mild fever	Verify status — wound contamination warrants update

💡 NCLEX High-Yield Pharm Pearl

In suspected necrotizing fasciitis, the classic empiric combination is **Vancomycin + Piperacillin-Tazobactam + Clindamycin**. Clindamycin is non-negotiable in Group A Strep because it shuts down toxin production at the ribosome — antibiotics that only kill bacteria still let pre-made toxins circulate. Hyperbaric oxygen therapy (HBOT) may be ordered as an adjunct, never as the primary treatment.

6 SECTION SIX NCLEX Test Traps

X COMMON TRAP

Patient with redness, swelling, and warmth → **diagnose as cellulitis** and start oral antibiotics at home.

✓ CORRECT ANSWER

If pain is **out of proportion** to visible findings, suspect necrotizing infection. **Admit, IV antibiotics, urgent surgical consult.**

X COMMON TRAP

Pain that suddenly goes away = patient is improving; **decrease pain meds.**

✓ CORRECT ANSWER

Sudden loss of pain = **nerve destruction**, infection worsening. **Notify HCP STAT** and prepare for surgery.

X COMMON TRAP

Wait for CT or MRI results before any intervention.

✓ CORRECT ANSWER

This is a **clinical diagnosis**. Do NOT delay debridement for imaging. Surgery + antibiotics start *now*.

X COMMON TRAP

Treat with antibiotics alone, since infection is the cause.

✓ CORRECT ANSWER

Surgical debridement is the definitive treatment.
Antibiotics cannot penetrate dead, thrombosed tissue.

X COMMON TRAP

Give antibiotics first, then draw blood cultures.

✓ CORRECT ANSWER

Cultures BEFORE antibiotics (unless it delays care > 45 min). Antibiotics still given within the 1-hr bundle.

X COMMON TRAP

Apply a wet-to-dry dressing and reassess in 8 hours.

✓ CORRECT ANSWER

Mark border of erythema and reassess HOURLY. Spread of redness past the mark = emergency.

SECTION SEVEN

7

Patient & Family Education



Wound & Recovery

- ✓ Multiple surgeries / debridements are common
- ✓ Expect skin grafts & reconstructive surgery
- ✓ Strict adherence to dressing changes
- ✓ Complete *full* course of antibiotics
- ✓ Attend ALL follow-up appointments



When to Call HCP

- ▶ New or spreading redness, warmth, or pain
- ▶ Fever > 100.4°F (38°C)
- ▶ Foul drainage or new bullae
- ▶ Increasing fatigue, confusion, decreased urine
- ▶ Black or purple skin discoloration



Prevention

- ✓ Wash any skin break with soap + water immediately
- ✓ Keep diabetes well-controlled (A1C < 7%)
- ✓ If immunocompromised: avoid raw oysters & warm saltwater with open wounds (Vibrio risk)
- ✓ Cover wounds with clean dressing until healed
- ✓ Vaccinations: tetanus, influenza, pneumococcal



Psychosocial Support

- ▶ Survivors face significant **disfigurement, amputation, and PTSD** — refer to counseling and survivor support groups
- ▶ Long ICU stays and prolonged rehabilitation are typical — coordinate physical/occupational therapy early
- ▶ Family education about appearance changes before they see the wound
- ▶ Address financial concerns — connect with case management and social work

SECTION EIGHT

8

Memory Boosters & Mnemonics



"FLESH" — Late Signs of Necrotizing Infection

F

Foul—smelling drainage ("dishwater pus")

L

Loss of sensation (anesthesia from nerve death)

E

Edema & erythema extending past visible borders

S

Skin discoloration: dusky, purple, bronze, black

H

Hemorrhagic bullae + crepitus (gas in tissue)



"SAD" — The Treatment Triangle

S

Surgical debridement — definitive, life-saving

A

Antibiotics — Vanc + Zosyn + Clindamycin

D

Decompensation support — fluids, pressors, ICU

Without surgery, the patient dies. Antibiotics cannot reach thrombosed, necrotic tissue.



Pattern Recognition

- ▶ **Pain >> appearance** = think necrotizing
- ▶ **Dusky purple + bullae** = late, surgical emergency
- ▶ **Diabetic + minor cut + sepsis** = think Type I (polymicrobial)
- ▶ **Raw oyster + immunocompromised + leg infection** = *Vibrio*
- ▶ **Painless area within painful zone** = nerve death = worse, not better



Time-Based Thinking

- ▶ "Time is tissue" — every hour without surgery ↑ mortality
- ▶ Sepsis 1-Hour Bundle is the framework
- ▶ Spreads ~1 inch/hour → mark border + reassess hourly
- ▶ Survivors require **weeks–months** of ICU + rehab



SECTION NINE — NEXT GENERATION NCLEX

NCJMM *Clinical Judgment Scenario*



Scenario

Patient: A 58-year-old male with Type 2 diabetes (A1C 9.2%) presents to the ED with a 36-hour history of severe right calf pain after sustaining a small scratch while gardening. He took ibuprofen at home without relief. **Vital signs:** T 102.8°F, HR 124, RR 26, BP 88/54, SpO₂ 94% on RA. **Pain:** 10/10, "worst pain of my life." **Exam:** Right calf shows a 4-cm area of mild erythema and swelling with disproportionate tenderness extending well beyond the visible border. Skin is warm and slightly dusky at the center. Patient is anxious, diaphoretic, and confused.



1 Recognize Cues

- ♦ Severe pain (10/10) **out of proportion** to small visible lesion
- ♦ Fever 102.8°F, HR 124, RR 26, BP 88/54 → meets SIRS criteria
- ♦ Dusky skin discoloration centrally — possible early necrosis
- ♦ Tenderness extends beyond visible borders
- ♦ Risk factors: uncontrolled diabetes, recent skin break
- ♦ Acute mental status changes, diaphoresis — early septic shock



2 Analyze Cues

- ♦ Pain disproportionate to appearance + systemic toxicity = classic necrotizing fasciitis pattern
- ♦ Hypotension + altered LOC + suspected infection = septic shock
- ♦ Diabetes is the highest-yield risk factor for Type I (polymicrobial) necrotizing infection
- ♦ Dusky skin = compromised perfusion — late finding, tissue at risk
- ♦ This is a **time-sensitive surgical emergency**



3 Prioritize Hypotheses

- ♦ **#1 — Necrotizing fasciitis with septic shock** (highest priority: life-threatening, hours matter)
- ♦ **#2 — Cellulitis with sepsis** (less likely; pain severity & dusky color don't fit)
- ♦ **#3 — DVT with secondary infection** (doesn't explain systemic toxicity)
- ♦ **#4 — Compartment syndrome** (possible coexisting concern)



4 Generate Solutions

- ♦ Establish 2 large-bore IVs (18-gauge)
- ♦ Draw blood cultures × 2, lactate, CBC, CMP, coags, CK, glucose
- ♦ Begin 30 mL/kg crystalloid bolus (0.9% NS or LR)
- ♦ Administer broad-spectrum IV antibiotics: **Vancomycin + Piperacillin-Tazobactam + Clindamycin**
- ♦ Page surgery STAT for emergent debridement
- ♦ Mark erythema border with marker + timestamp
- ♦ Insert Foley for hourly UOP; prepare for possible norepinephrine if MAP < 65
- ♦ NPO; type & crossmatch; obtain surgical consent

5 Take Action

- ♦ Established 2 IVs; drew cultures & labs at 14:02
- ♦ Started 2-L NS bolus at 14:05
- ♦ Vancomycin, Zosyn, and Clindamycin hung at 14:18
- ♦ Marked border + photographed wound at 14:10; reassessing q15 min
- ♦ Surgery responded — patient transported to OR at 14:45
- ♦ Started norepinephrine at 14:30 when MAP fell to 58 despite fluids
- ♦ Family notified; ICU bed reserved post-op; case management notified

6 Evaluate Outcomes

- ♦ ✓ Emergent debridement completed within 90 minutes of arrival
- ♦ ✓ Post-op MAP improved to 72; norepinephrine weaning
- ♦ ✓ Lactate down from 5.2 → 2.8 mmol/L over 6 hours
- ♦ ✓ Erythema has not advanced past marked border
- ♦ ✓ Cultures: Group A Streptococcus + Staph aureus (polymicrobial)
- ♦ ⌚ Plan: serial debridements q24h until wound clean; continue IV antibiotics; ICU monitoring; glucose control with insulin gtt; PT/OT consult; psychosocial support for anticipated reconstructive surgery

"Pain out of proportion. Time is tissue. Time is life."

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