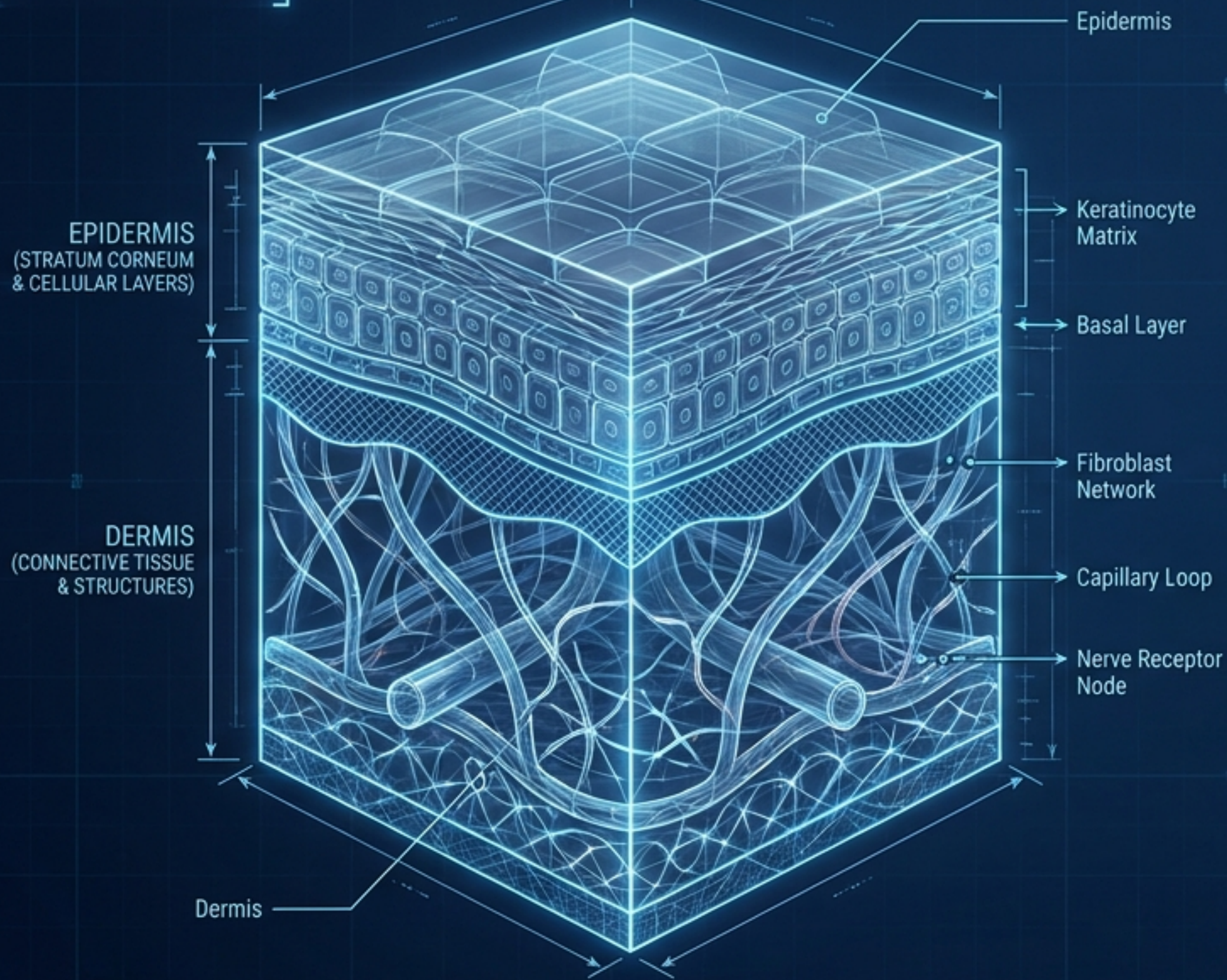


Clinical Physics
Ref: #PB-2026-AFTE
// Date: 2026-07-07
// Tech Rigor: 82%



Aftercare is Applied Wound-Healing Biology

What works, what does not, and why.
Precision Engineering for Body Arts.

Patrick Poli, Chief Engineer | Poli International

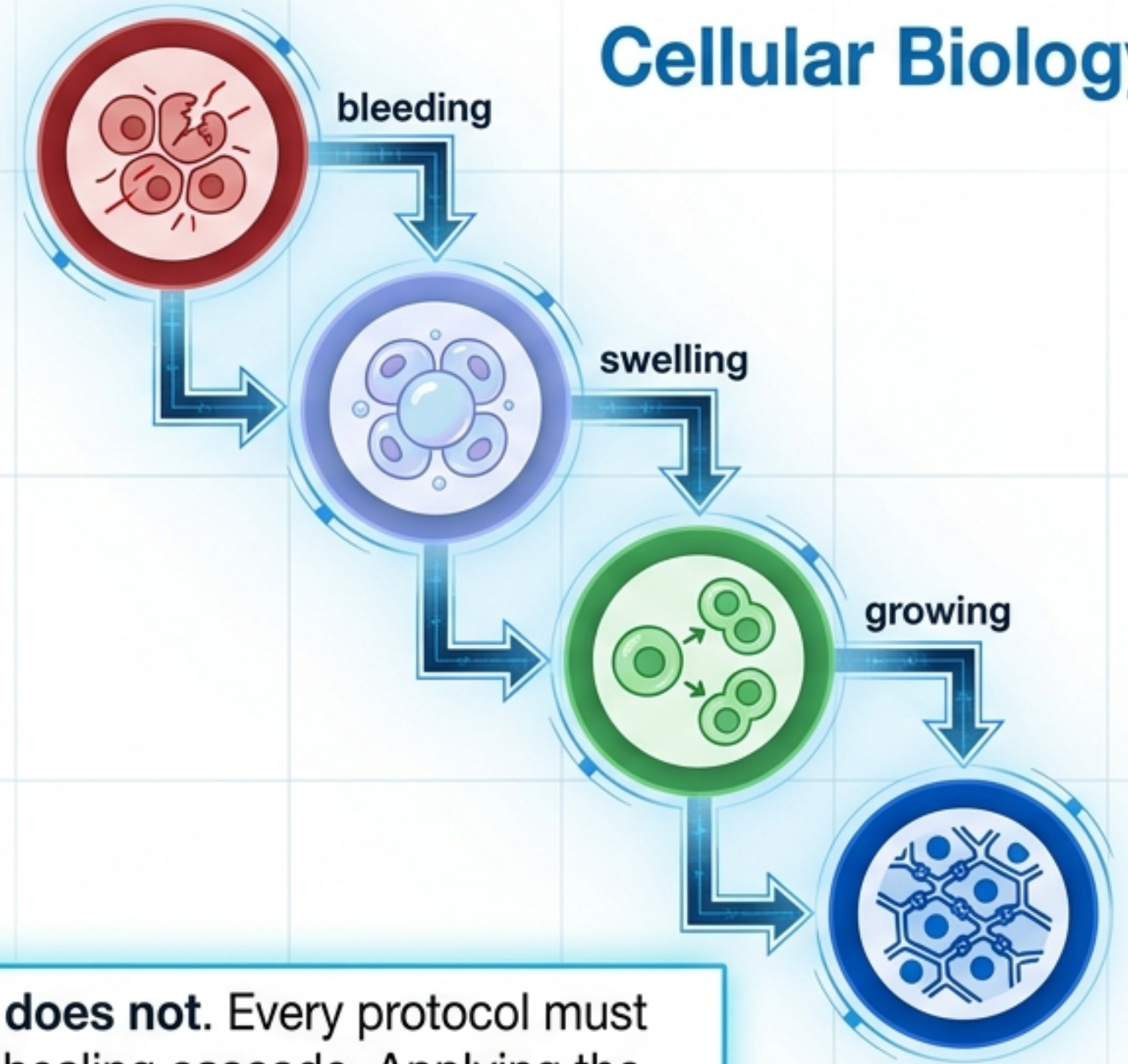
Aftercare is where safety outcomes are decided

Preference, Marketing & Habit



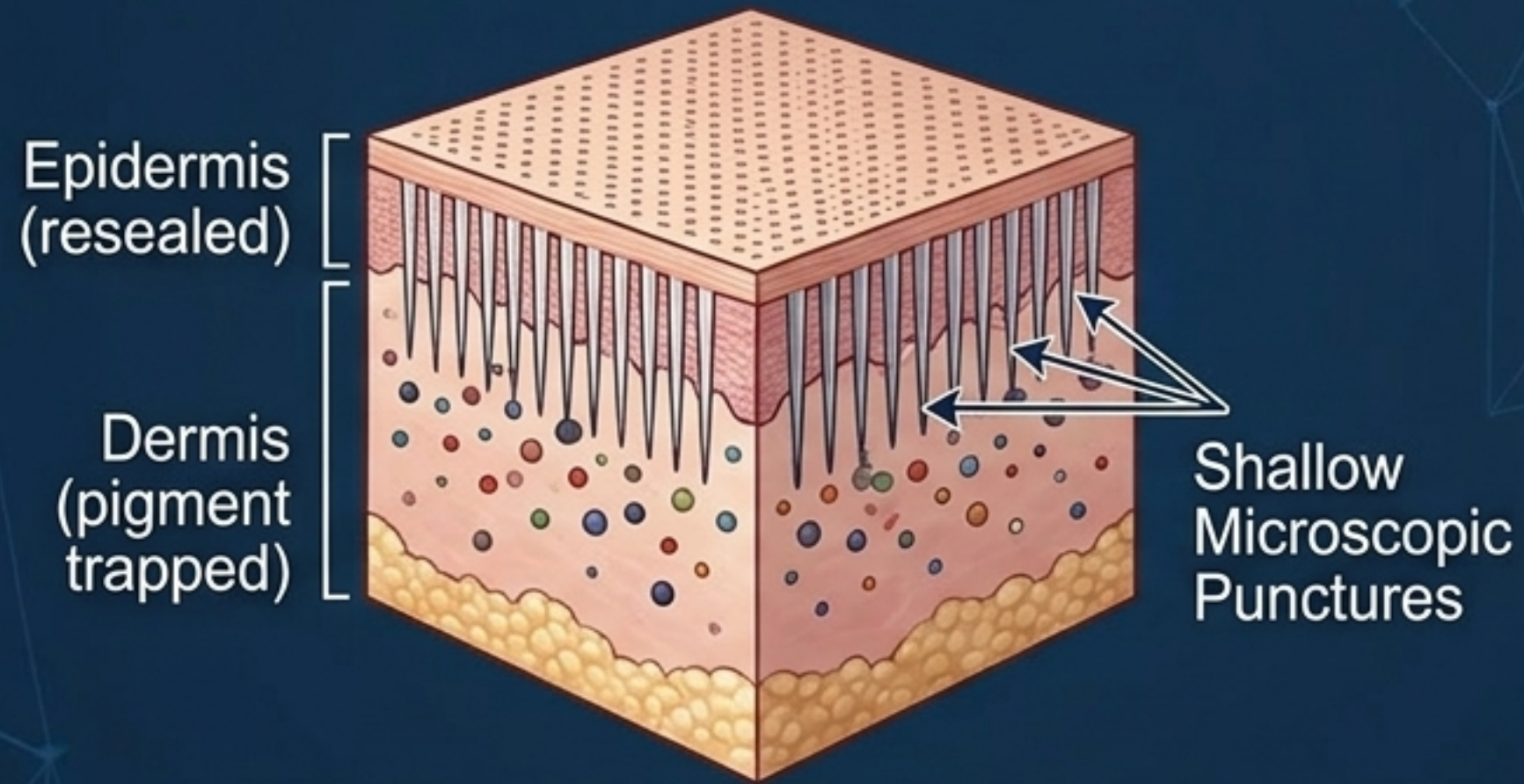
The products change, but the **biology does not**. Every protocol must support the human body's four-phase healing cascade. Applying the wrong product at the wrong phase prolongs inflammation or traps bacteria.

Cellular Biology

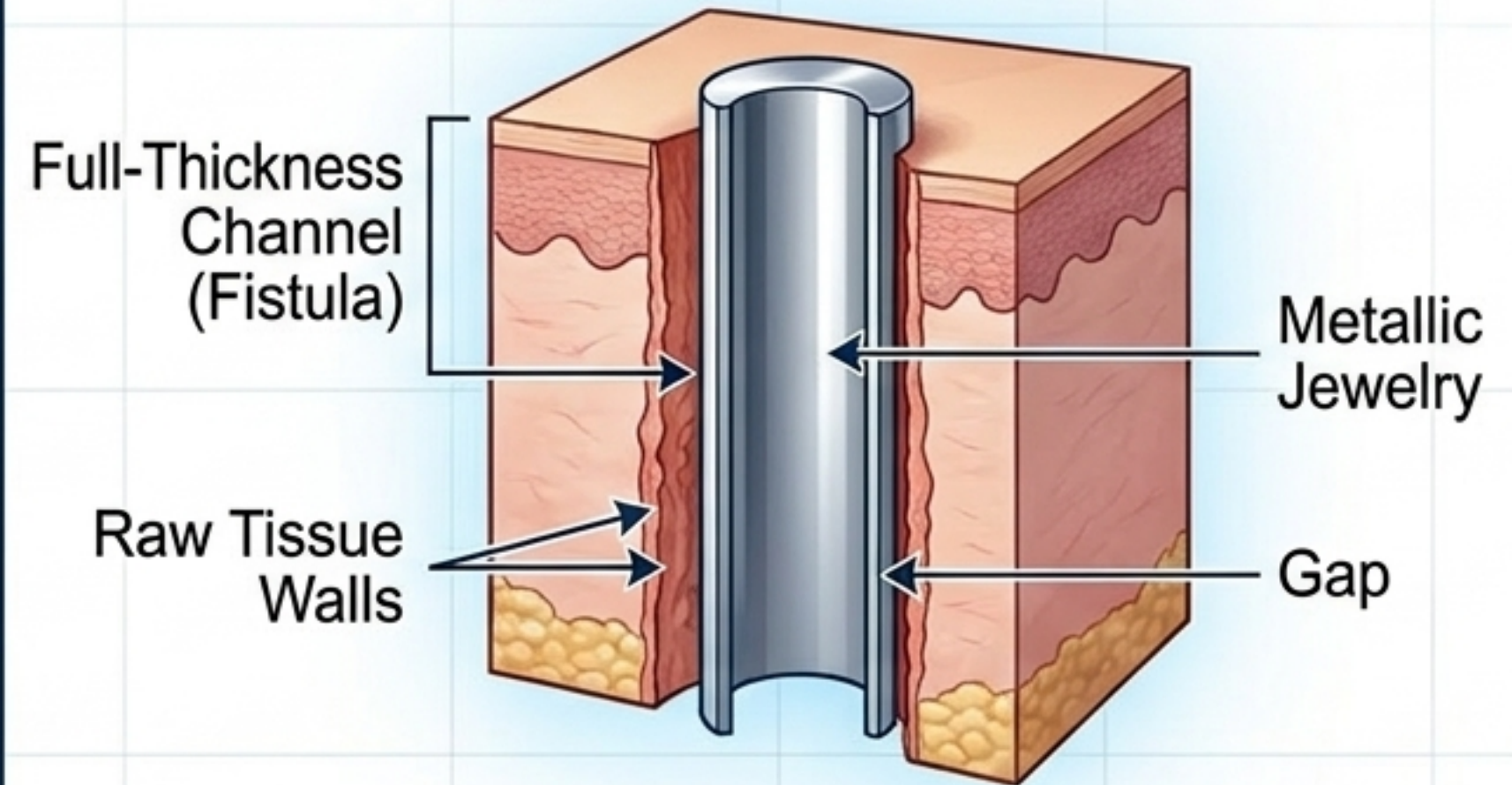


Wound Architecture Determines the Intervention

Tattoo Architecture

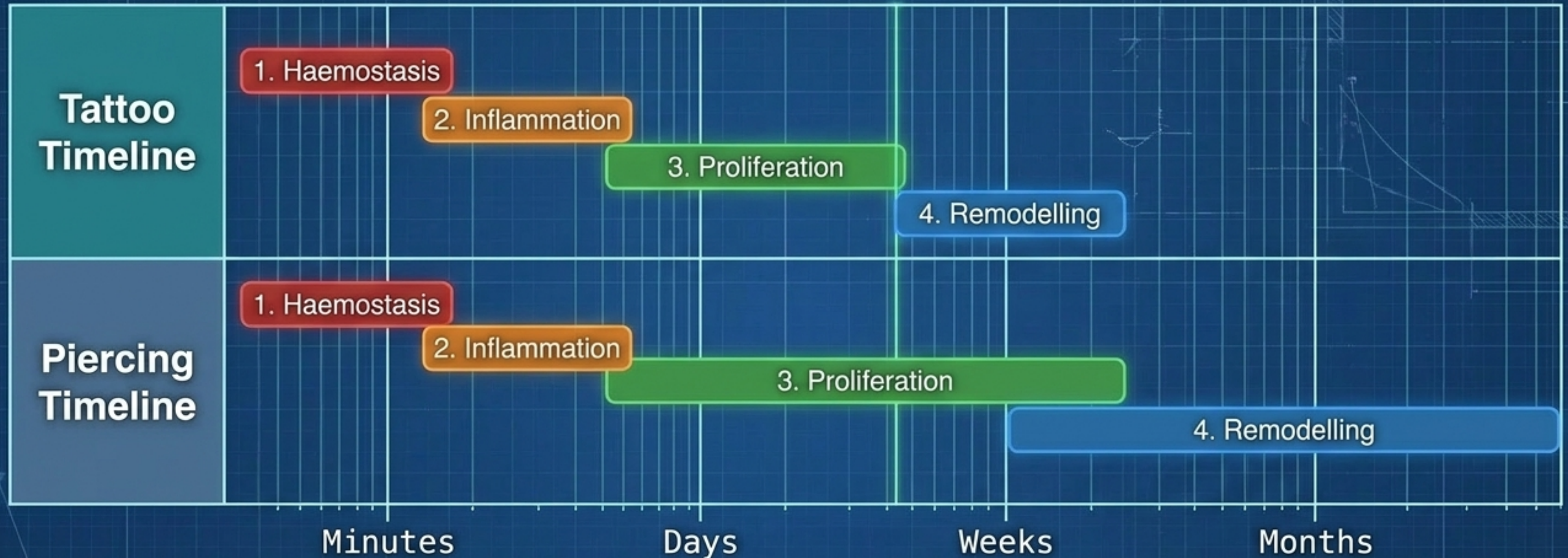


Piercing Architecture



Thousands of shallow punctures	Geometry	Single full-thickness channel
Surface re-epithelialisation	Healing Mechanism	Fistula tract formation
Moist & Occlusive	Ideal Environment	Dry & Breathable

The Universal Four-Phase Healing Cascade



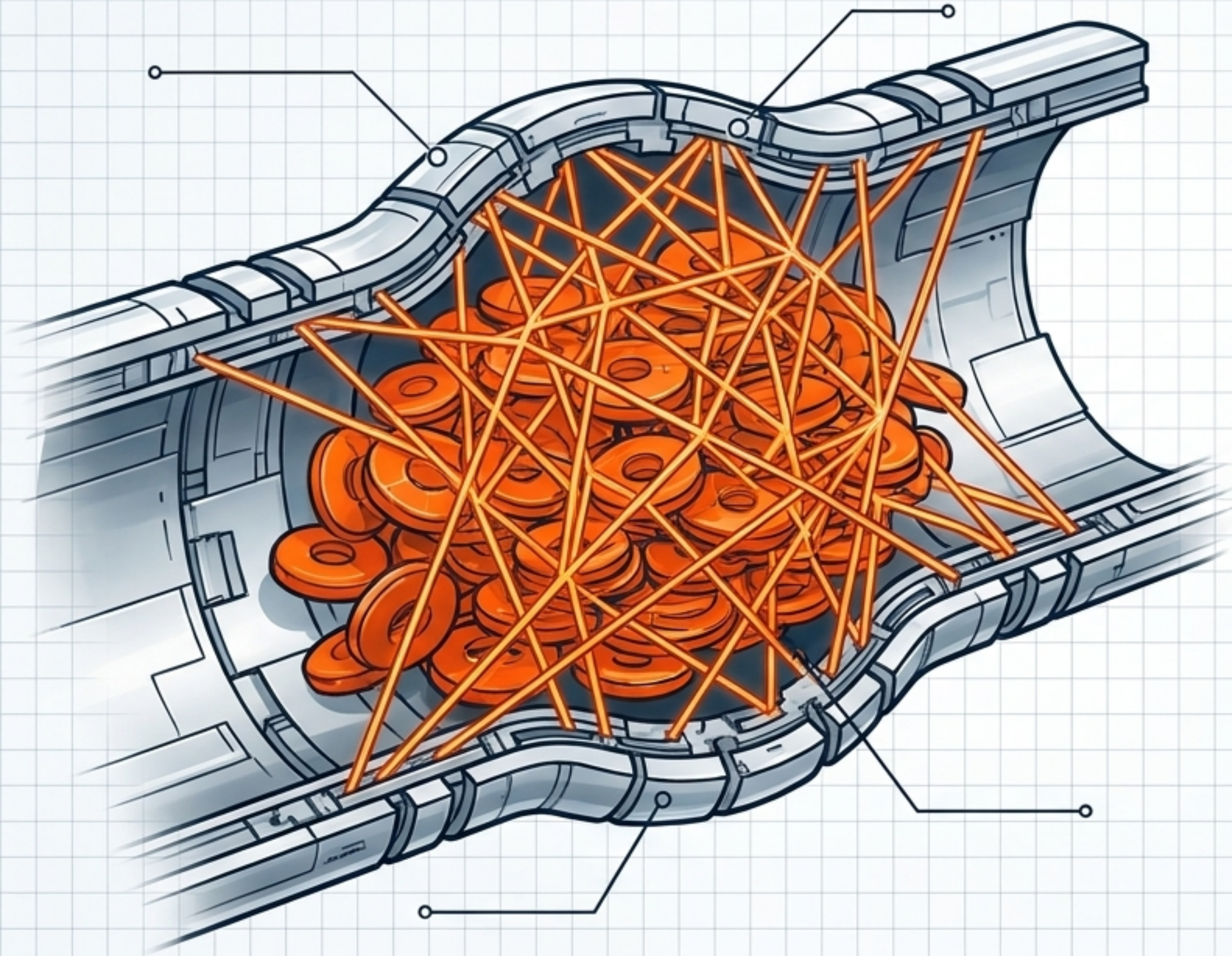
1. Haemostasis
(Minutes to Hours)

2. Inflammation
(Day 1 to 6)

3. Proliferation
(Days to Weeks)

4. Remodelling
(Weeks to Months)

Phase 1: Haemostasis (Minutes to Hours)

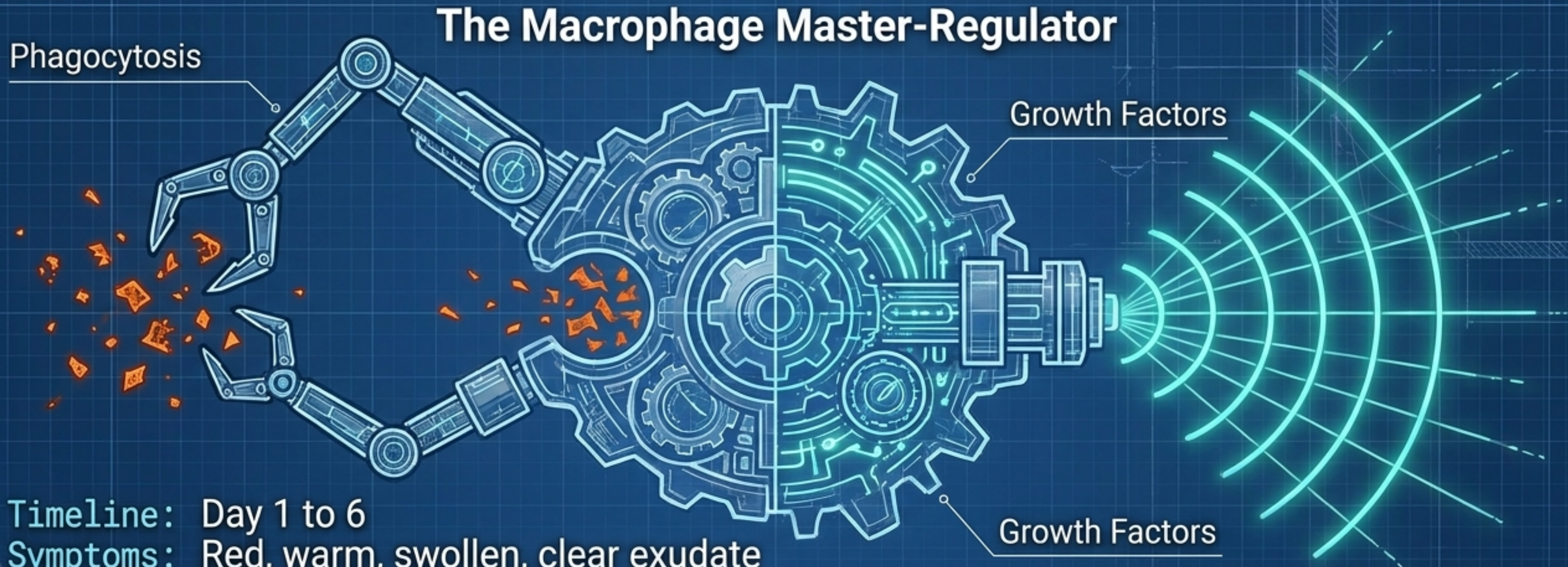


Action:
Vasoconstriction, platelet plug formation.

Result:
The Fibrin Clot.

Clinical Significance:
This clot is not just a scab; it provides the essential provisional matrix for incoming repair cells to walk across.

Phase 2: Inflammation is a mechanism, not an infection



Timeline: Day 1 to 6

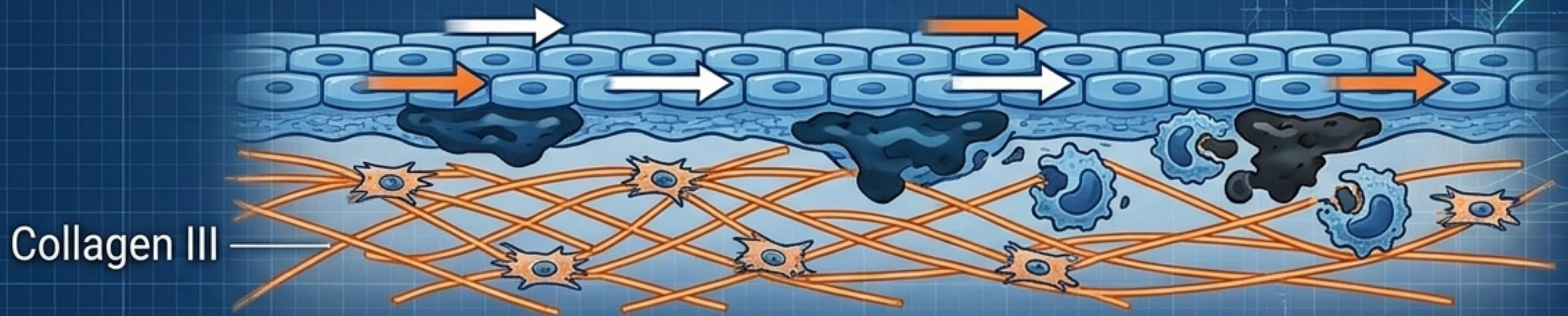
Symptoms: Red, warm, swollen, clear exudate

The Actor: Neutrophils, followed by Macrophages

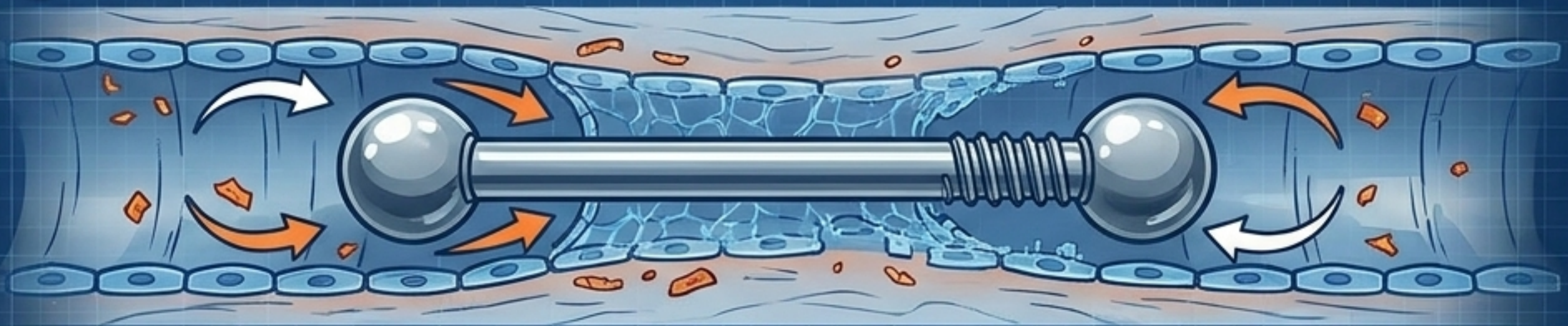
The Reality: This is productive biology. Macrophages are master regulators clearing debris and triggering the next cellular phase. Suppressing this unnecessarily delays healing.

Phase 3: Proliferation and Structural Closing

Tattoo - Day 4 to 21

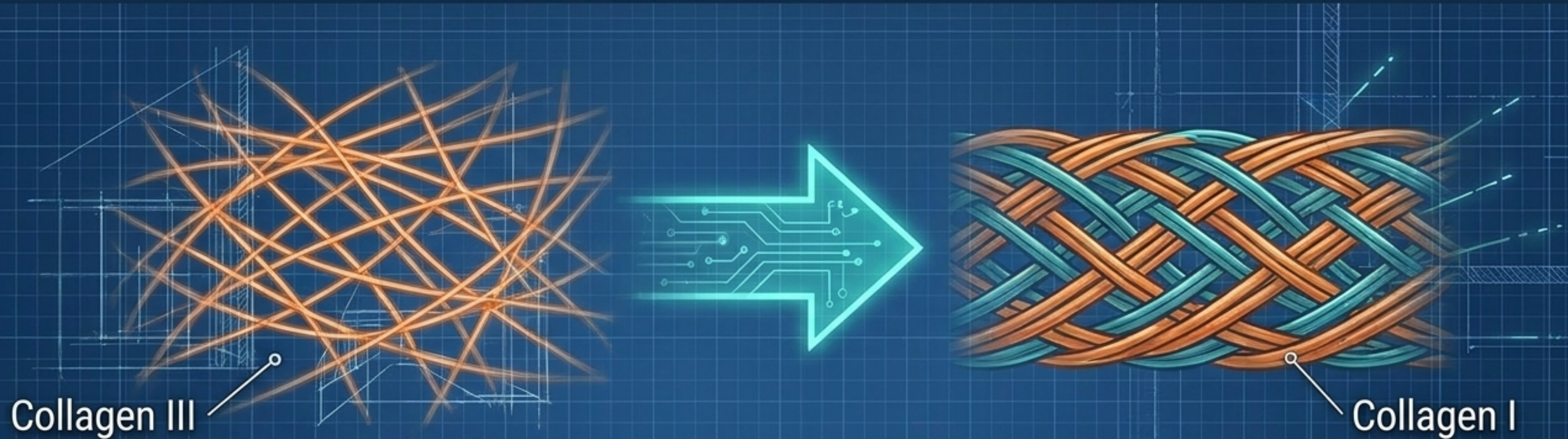


Piercing - Day 4 to Week 8+



Key Mechanisms: Angiogenesis, fibroblast migration, and the critical deposition of Collagen III.

Phase 4: Remodelling and Tensile Strength



A piercing fistula only reaches roughly 80% of its final tensile strength at week 12. It continues remodeling for a year or more.

Takeaway: Visual healing is deceptive. Internal structural maturation takes months.

The Science of Moist Wound Healing

Ref: Winter GD, 1962. Nature. 193:293-294.

Dry Healing



Wet Healing



The Evidence: A moist environment accelerates re-epithelialisation by approximately 50% compared to air-exposed wounds. Epithelial cells migrate seamlessly across moisture, not under dry scabs.

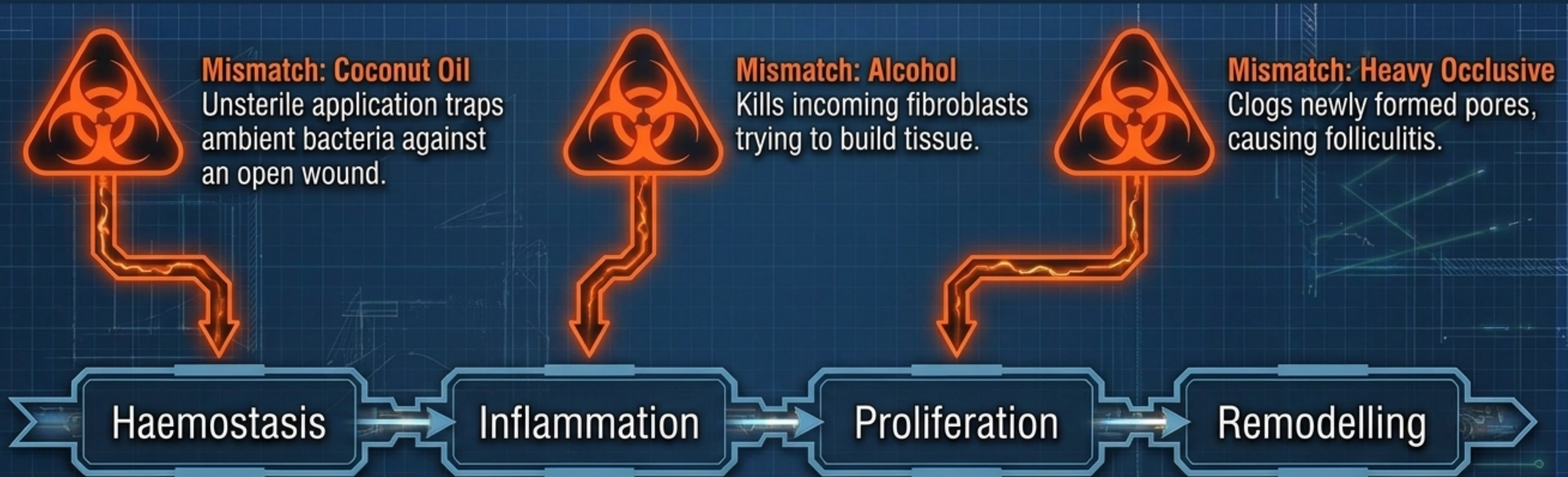
The Ingredient Audit: Barrier Compounds

Ingredient	Function	Evidence for Wound Use	Risk
White Petrolatum	Occlusive barrier	Decades of wound-care use; accelerates epithelialisation	Maceration if applied too thickly
Dimethicone	Silicone occlusive	Used in medical barrier creams; highly breathable	Very low irritancy
Lanolin (USP)	Semi-occlusive	Effective TEWL reduction	Contact allergen in 1.5–2.5% of dermatitis patients
Panthenol (B5)	Humectant	Promotes fibroblast proliferation in vitro	Low irritation

The Ingredient Audit: Cytotoxins and Sensitizers

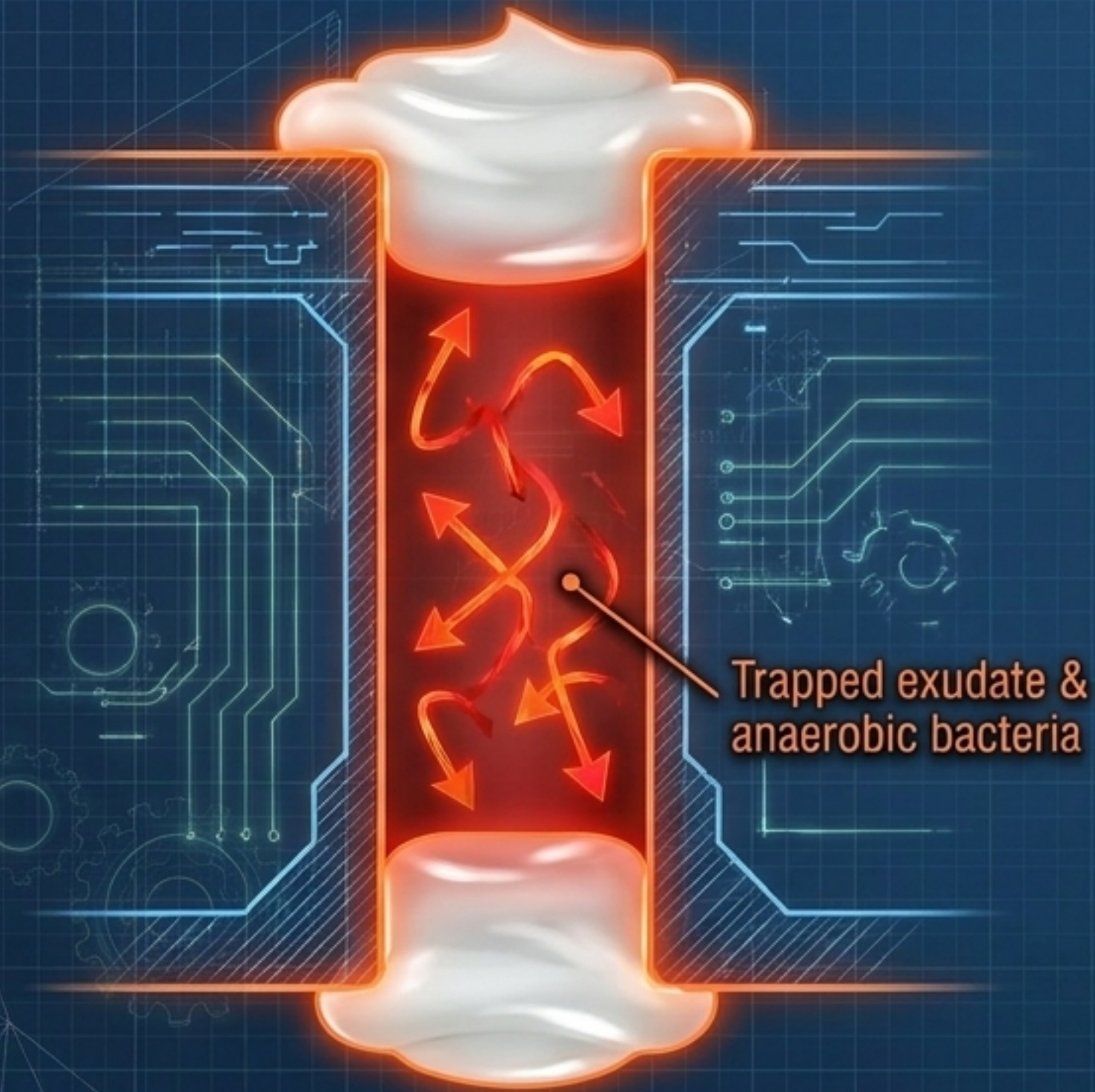
 Ingredient	Function	Clinical Reality 
Alcohol (Isopropyl/Ethanol)	Solvent / Antimicrobial	Cytotoxic to fibroblasts and keratinocytes. Delays wound healing entirely.
Hydrogen Peroxide	Antiseptic	Cytotoxic to fibroblasts. Impairs re-epithelialisation. Rejected by current guidelines.
Fragrance / Parfum 	Scent	Zero therapeutic benefit. High contact allergen risk. Avoid entirely on fresh wounds. 

Complications Stem from Phase-Mismatch



**The right product at the wrong phase
is as bad as the wrong product.**

The Occlusive Trap (Why piercings require dry healing)



The Mechanism:

An occlusive ointment on a fresh piercing blocks the fistula opening. It traps moisture and creates a sealed, anaerobic environment favorable to bacteria.

The Piercing Standard:

Sterile isotonic saline.
Isotonic with body fluids, non-cytotoxic,
and preservative-free.

Evidence-Based Protocol: **Tattoos**

Phase 1-2 (Days 1 to 5)

Goal: Support re-epithelialisation.

Intervention: Thin layer of petrolatum-based or dimethicone-based occlusive, 2-3x daily after gentle cleansing with fragrance-free mild soap. Wound must not feel suffocated.



Phase 3-4 (Day 4 to 21+)

Goal: Moisture management, prevent pore blockage.

Intervention: Switch to a fragrance-free, water-based moisturiser. Do not over-moisturise.

The Complete Piercing Equation



External (The Wash):
Sterile isotonic saline,
applied twice daily.
Keep the area completely
dry afterward.



Internal (The Scaffold):
BioFlex implant-grade medical
elastomer. Material must not
leach nickel or degrade in the
moist fistula environment.



**Dermal
Recovery**

Diagnostic Triage: The Piercing Bump

Start: Bump develops on fresh cartilage piercing.

Step 1: Identify Irritant

- Pressure (sleeping/headphones)?
- Inappropriate jewelry length/material?
- Harsh aftercare?

Remove source of irritation immediately.

Step 2: Protocol Reset

Return to strict sterile saline 2x daily. Keep strictly dry.

Step 3: Evaluation

If bump persists beyond 2-3 weeks of optimized care
-> Consult professional.



WARNING: DO NOT apply aspirin paste, tea tree oil, or wart removers. These are cytotoxic irritants.

Clinical Standards for Physical Intervention

MYTH

EVIDENCE

Intervention 1: Rotation

Myth: Rotate to prevent sticking.

Evidence: DO NOT ROTATE. Tears the fragile new epithelial layer inside the fistula and drags external bacteria into the wound.

MYTH

EVIDENCE

Intervention 2: Cleansing

Myth: Use harsh antibacterial soap.

Evidence: Fragrance-free mild soap is sufficient for tattoos. Triclosan and chlorhexidine are unnecessarily irritating for routine care.

MYTH

EVIDENCE

Intervention 3: Occlusion (Dressings)

Standard: 2-24 hours for simple pads. Film dressings up to several days. Remove immediately if fluid builds up or seal breaks.

The Protocol Imperative

“Your aftercare protocol is the last thing your client remembers about the appointment, and it is the first thing they blame when something goes wrong.”

1. **Do not** rely on verbal run-throughs.
2. **Write it down.** Print it.
3. **Match** the written protocol to the wound architecture, the placement, and the specific phase of healing.

