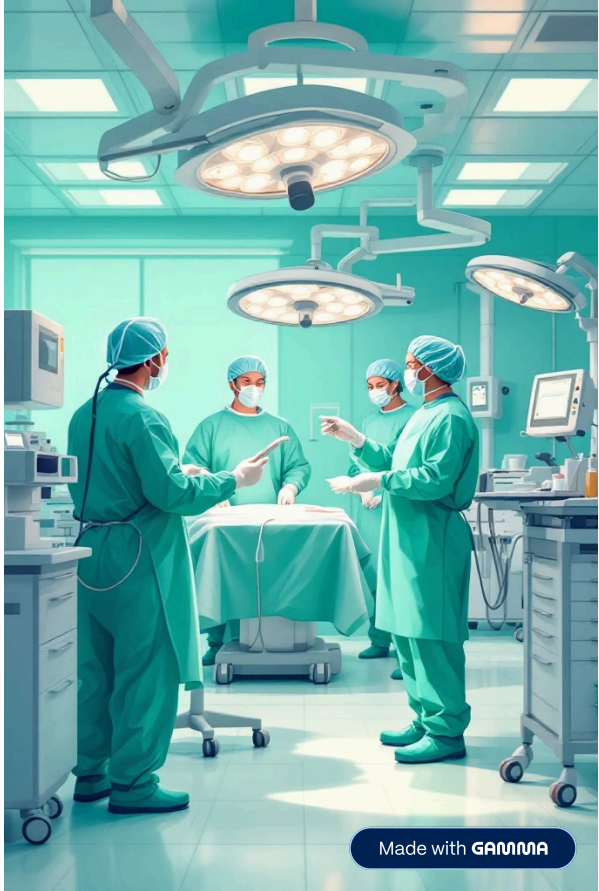
Surgical Wound Care, Ethics & Aseptic Technique



Wound Classification by Contamination

This classification directly determines antibiotic use, closure method, and infection risk assessment.

Class I: Clean

No entry into respiratory/GI/GU tracts. Example: hernia repair.

Class II: Clean-Contaminated

Controlled entry into viscera. Example: elective bowel surgery.

Class III: Contaminated

Gross spillage, traumatic wounds less than 6 hours old.

Class IV: Dirty/Infected

Established infection or perforated viscus present.

Type of wound	Definition	Risk of infection	Antibiotic Prophylaxis	Other notes
Clean	No entry into RS/ GI/GU tracts	<2%	Don't Give	give antibiotics only if higher risk of infection, ex: immunocompromised or sensitive areas where if infected the complications are catastrophic like cardaic and brain surgeries.
Clean-Contaminated	Controlled entry into RS/GI/GU tracts	5-10%	Give	—
Contaminated	Results when 1 of the conditions of clean contaminated is missing. For example no longer controlled entry, as in the surgeon accidentally touches something non sterile, or gross spillage occurs	10-15%	Give	—
Dirty	Wound already infected or crush injury and traumatic wound	—	We give THERAPEUTIC not prophylactic	—

↓

(residency exam Question!)

Wound Healing Phases

Hemostasis

Platelets release PDGF and TGF-β. Fibrin scaffold forms immediately.

Inflammatory

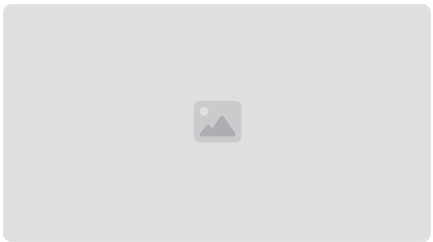
Neutrophils arrive first. Macrophages release VEGF and cytokines.

Proliferative

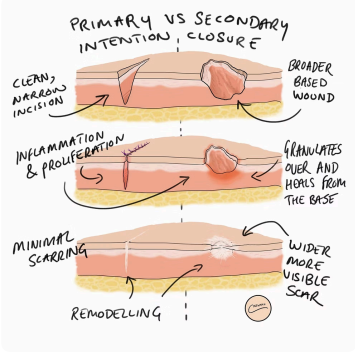
Fibroblasts produce type III collagen. Beefy red granulation tissue.

Remodeling

Type III converts to type I collagen. 20% strength at 3 weeks, ~80% max.



Types of Wound Closure



Advanced Wound Management

Debridement Methods

- **Sharp/surgical** – fastest, gold standard technique
- **Autolytic** – via occlusive dressings
- **Enzymatic** – collagenase application

Mechanical: wet gauze is put on wound and left to dry then removed where the gauze will remove the tissue stuck to it. It is very painful for the pt. And is very traumatic causes reopening of wound and bleeding.
no longer used

Modern Dressing Types & Indications

Ideal condition for wounds = Not too dry & not too wet → use apropriate dressing

Dressing Type	Indication
Hydrocolloid	Low exudate wounds = dry wound
Alginate	Heavy exudate management = wet wound
Foam	Moderate exudate
Silver dressings	Infected wounds requiring antimicrobial properties

promotes angiogenesis and granulosis leading to healing. Promotes mitosis through inflicting microstrain. Also decreases dead space. Removes dead tissue and exudates

Negative Pressure Wound Therapy (NPWT)

Mechanism: Removes exudate, improves perfusion, promotes granulation.

Indications: Chronic wounds, large surgical wounds requiring enhanced healing.

C/I:

1. exposed blood vessels causing erosion and bleeding.
2. exposed nerves.
3. Flap / graft.
4. directly on organ (ex: bowel) causes erosion and perforation.
5. directly on malignancy, since it promotes mitosis, it will encourage cancer growth.
6. infected bone (osteomylitis), creates closed space that promotes infection, ideal area for abscess formation, since it cannot clear the infxn from the bone, u need to surgically debride it first.

Chronic Wounds & SSI Prevention

Diabetic Foot Ulcers

Causes: Neuropathy plus ischemia. **Management:** Offloading (total contact cast), glycaemic control, debridement.

Pressure Ulcers

Sites: Sacrum, heels. **Prevention:** Repositioning, pressure-relieving mattresses.

SSI Risk Factors

Diabetes, obesity, prolonged surgery, poor aseptic technique.

Prevention Strategies

Antibiotic prophylaxis within 60 minutes before incision, proper scrubbing, normothermia maintenance.

Informed Consent & WHO Checklist

Informed Consent Requirements

- Nature of procedure explained
- Risks (common and serious)
- Benefits and alternatives
- Complications of not operating

Capacity Criteria: Understand, retain, weigh information, communicate decision.

WHO Surgical Safety Checklist

1. **Sign In** – before anaesthesia
2. **Time Out** – before incision
3. **Sign Out** – before leaving OR

Ensures correct patient, site, and procedure. Prevents never events like wrong-site surgery.

OR Ethics, Confidentiality & Professional Standards

Speaking Up

If sterile field broken, MUST declare immediately. Junior doctors have ethical duty to intervene.

Surgeon's Responsibility

Cannot delegate accountability. Must supervise trainees properly at all times.

Resource Allocation

ICU beds and OR time require justice principle consideration in distribution.

Confidentiality

Avoid discussing unrelated patient information. Never use identifiable details in teaching.

Professional Misconduct Examples

- Ignoring sterility breach during procedure
- Operating without proper patient consent
- Disrespectful or unprofessional behaviour

Sign in: Done by anesthesia/nursing
- Pt name and id no.
- Allergies (to antibiotics or anesthesia (malignant hyperthermia))
- Type of surgery and location (rt/lt) (note: if surgery is not related to something that is bilateral then no need to specify location. Ex: lab coli surgery) (residency question!)
- Consent
- Anesthesia perfrom airway assessment
- Nursing confrim markings and pt information

Consent:
- Pt name and ID
- Indication
- Type of surgery / procedure
- Possibility of conversion for type of sx (ex: laparoscopy to laparotomy)
- مع اجراء كل ما يراه الجراح مناسبا
- Type of anesthesia
- Risk level of sx (high, med, low) with percent and risk of death
- Alternative procedures that can be done
- Possible results if no surgery is performed
- signiture: yours + day and time + pt's signature with 3 or 4 name parts + gaurdian's (usually father of child unless unavailable then mom's)
- Complications:
 infection
 bleeding
 hematoma
 seroma formation
 injury to adjacent organs and the results of this injury (ex: recurrent laryngeal N. Injury in thyroid sx)
 drain insertion
 incisional hernia
 adhesions
 add specific complications (leak in anastomsis sx, stenosis, infertility, etc..)

Note: never do anything w/o consent unless it's life-saving

Time out:
- patient name
- type of surgery (brief description)
- estimated time and blood loss
- any specific lab or imaging results that are of special concerns to pt.
- if abx is planned
- surgeon and team members names
- anesthesia and must reply: their name, type of anesthesia, abx given, any special concerns
- nursing reply: tools complete and sterile

Sign out:
- done by all 3
- surgeon: type of sx, complications, special scenarios that occurred during sx
- anesthesia: plan (ex: admission to icu)
- nursing: tools count complete and correct, specimen labeled and delivered to lab

Surgical Scrubbing & Aseptic Technique

Antiseptic Agents

- **Chlorhexidine** – long-lasting effect
- **Povidone-iodine** – broad spectrum

Scrubbing Techniques

Timed scrub: 3–5 minutes total.

Stroke count method: Each surface scrubbed specific number of strokes.

Detailed Scrub Sequence

Gowning & Gloving (Closed Technique)

- Hands stay inside sleeves during gowning
- Gloves applied without skin exposure
- Sterile touches sterile only principle
- Front of gown = sterile, back = non-sterile

Scrubbing Principals:
- sterile box:
top border: chest
bottom: level of tabel
sides: hands to elbow
- back is always facing non sterile environment
- any drapes below the level of the table are considered non sterile
- sterile always faces sterile and the same for non sterile, when passing and moving through the room
- hand washing: one way from distal to proximal, hands

Common Errors (VERY TESTABLE)

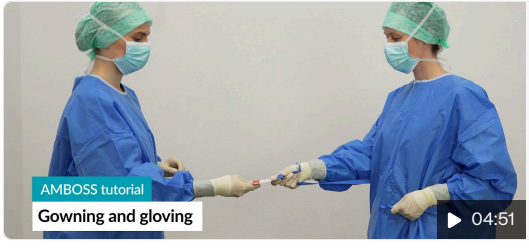
- Hands below waist level
- Wet gown causes contamination
- Turning back to sterile field
- Reaching over sterile field

Golden Rule: If contamination occurs, acknowledge immediately and rescrub/reglove without delay.

YouTube

Scrubbing in (surgical scrub): brush-stroke method | AMBOSS tutorial

This video shows you how to scrub in for the OR with the counted brush stroke method. You can find more information on infection prevention and scrubbing...



YouTube

Gowning and gloving | AMBOSS tutorial

This video shows you how to quickly and safely don a surgical gown and gloves, both by yourself and when you have more assistance. You can find more information on...