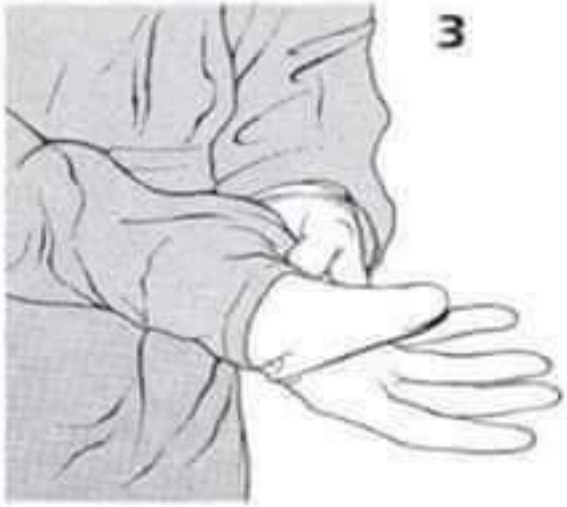
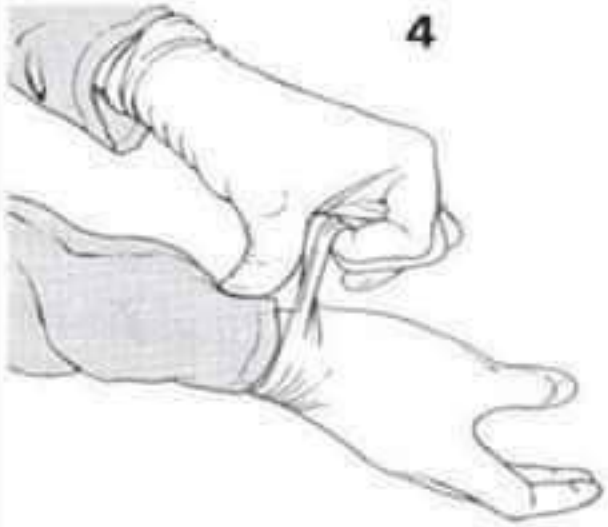




GLOVING

- Pull glove onto right hand in similar fashion to placing left glove (3)
- Ensure that cuffs cover ends of both gown sleeves (4)

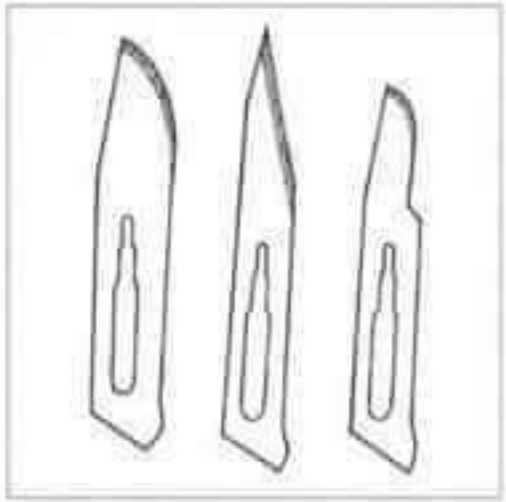
INSTRUMENTS

When using scalpel for dissection,

- use smaller knife
- hold instrument like a pen: thumb and third finger holding knife, with index finger controlling dissection

Most procedures are performed with a #3 handle and

- #10 blade for large incisions
- #11 for stab incision
- #15 for fine precision work

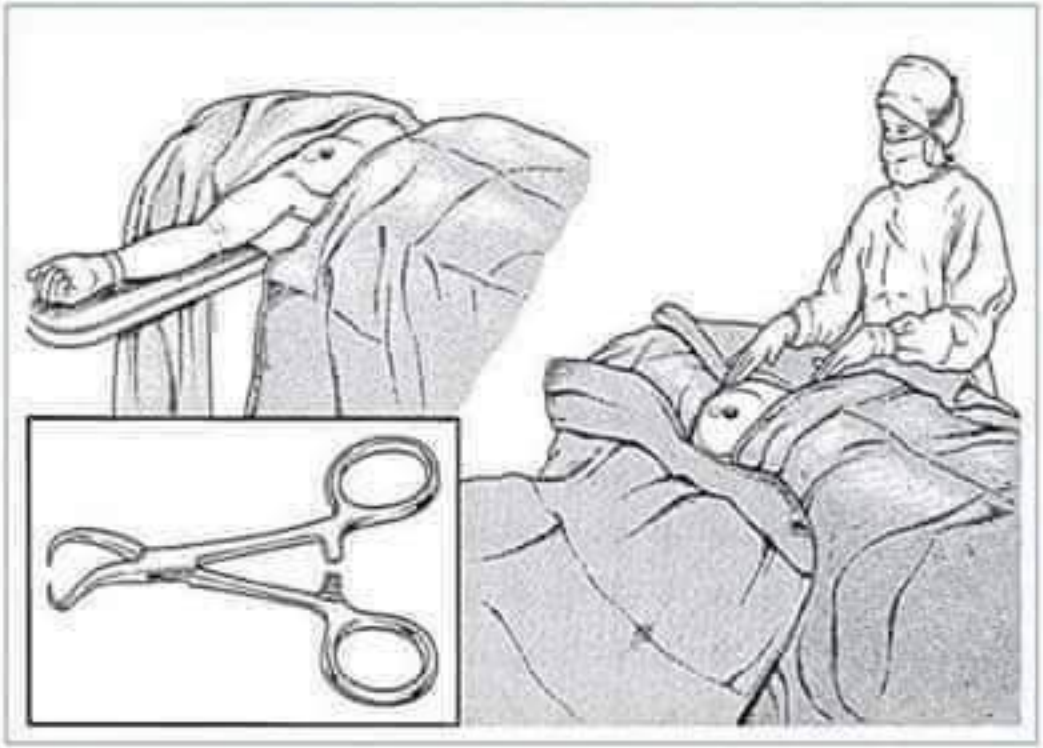


#10 #11 #15

SKIN PREPARATION

- Before operation, wash surgical site, surrounding area with soap, water; particularly wash debris from injuries
- Prepare skin with antiseptic solution; start in centre, move to periphery
- Chlorhexidine gluconate and iodine preferable to alcohol as less irritating to skin
- Solution should remain wet on skin for at least two minutes

DRAPING



- Do not place drapes on patient until scrubbed, gowned, gloved
- Leave uncovered only operative field (areas that have been prepped) and areas necessary for anaesthesia
- Secure drapes with towel clips at each corner

WOUND MANAGEMENT

Surgical wound classification:

- Clean
- Clean Contaminated: normal but colonized tissue
- Contaminated: contains foreign or infected material
- Infected: obvious pus present

WOUND MANAGEMENT

- Clean wounds: close immediately to allow healing by primary intention
- Contaminated or infected wounds: never close, leave open to heal by secondary intention
- Clean Contaminated: surgical toilet, leave open, then close 48 hours later - *delayed primary closure*
- Careless closure of a contaminated wound will promote infection and delay healing

WOUND MANAGEMENT

Primary repair:

- Primary closure requires clean tissue to be approximated without tension
- Leave skin sutures in place for an average 7 days; longer if healing expected to be slow due to blood supply of particular location (back or legs) or patient's condition
- Close deep wounds in layers; absorbable sutures for deep layers

WOUND MANAGEMENT

Delayed Primary Closure:

- Irrigate clean contaminated wounds, then pack open with damp saline gauze
- Close wounds with sutures at 2 days

Secondary healing:

- Perform wound toilet, surgical debridement without closure; may need skin graft

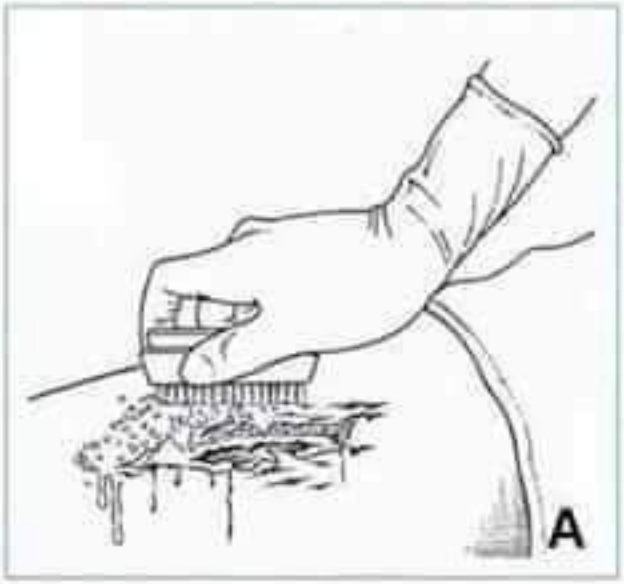
WOUND TOILET AND SURGICAL DEBRIDEMENT

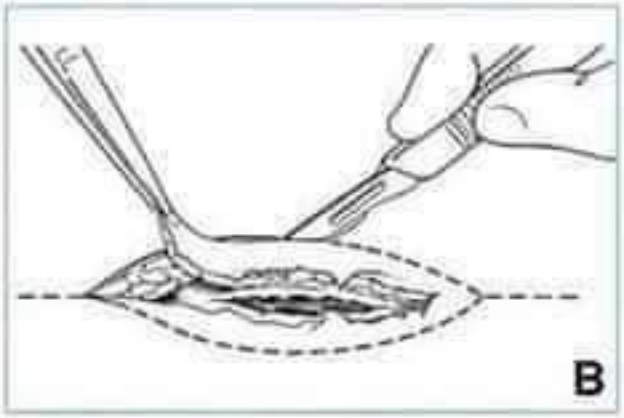
- Thoroughly clean the wound with normal saline or sterile water.
- It is important to use a large volume of fluid and pressure to remove all visible dirt and debris from a wound
- Use a large syringe for irrigation. Attach a 16 or 19 gauge needle or soft IV catheter to generate pressure.

WOUND TOILET AND SURGICAL DEBRIDEMENT

- Gentle handling of tissues to minimize bleeding, additional trauma
- Control residual bleeding with compression, ligation, cautery
- Dead or devitalized muscle is dark in color, soft, easily damaged; does not contract when pinched
- Dead tissue does not bleed when cut

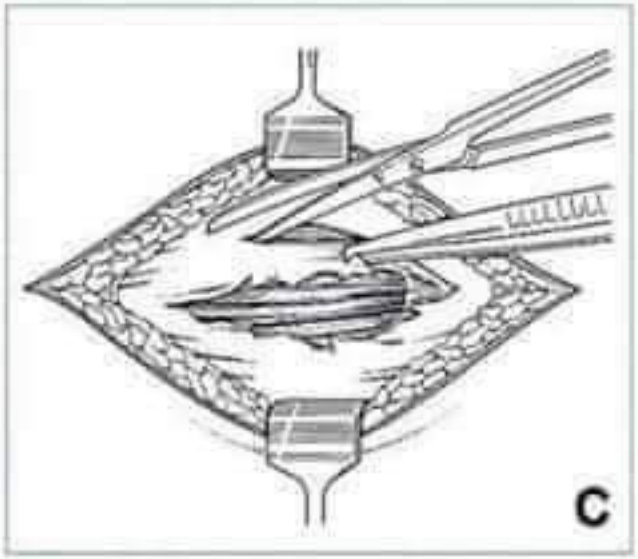
WOUND TOILET AND SURGICAL DEBRIDEMENT

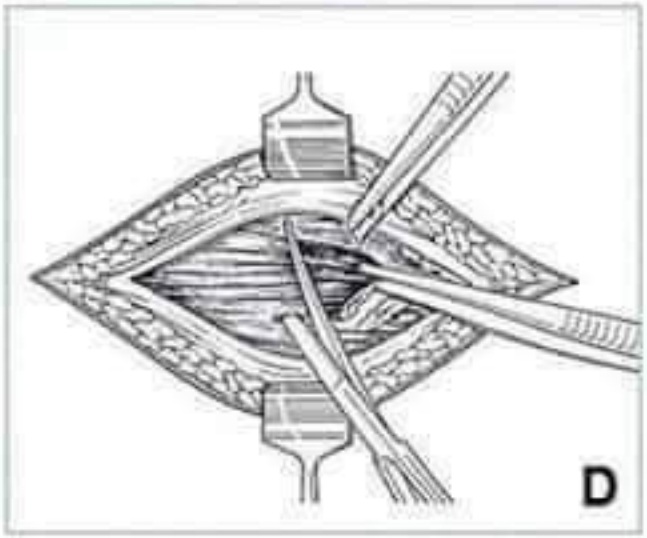




- Wash wound with large quantities of soap and boiled water for 10 minutes, then irrigate with saline; prep skin with antiseptic (A)
- Debride wound meticulously to remove loose foreign material, use surgical techniques to cut away damaged, dead tissue
- Excise only very thin margin of skin from wound edge (B)

DEBRIDEMENT





- Systematically perform wound toilet, surgical debridement; initially to superficial tissue layers, subsequently deeper layers (C and D)
- With scalpel or dissecting scissors, remove all adherent foreign material along with a thin margin of underlying tissue, irrigate
- Continue cycle of surgical debridement, saline irrigation until wound is completely clean

WOUND TOILET AND SURGICAL DEBRIDEMENT

- Leave wound open after debridement to allow for healing by secondary intention
- Pack lightly with damp saline gauze, cover packed wound with dry dressing
- Change packing, dressing daily - more often if outer dressing becomes damp with blood, other body fluids
- Large defects will require closure with flaps or skin grafts but may be initially be managed with saline packing

PREVENTION OF WOUND INFECTIONS

- Restore breathing, blood circulation as soon as possible after injury
- Warm victim; at earliest opportunity provide high-energy nutrition, pain relief
- Perform wound toilet, debridement as soon as possible (within 8 hours if possible)
- Respect universal precautions
- Antibiotic prophylaxis for deep or penetrating wounds (dirty stick, knife) and wounds older than 12 hours

PREVENTION OF WOUND INFECTIONS

Factors that affect wound healing and infection potential

Patient

- Age
- Underlying illnesses or disease: anemia, diabetes, immune deficient

Wound

- Organ or tissue injured
- Extent of injury
- Nature of injury (laceration less complicated than crush injury)
- Contamination or infection
- Time between injury and treatment (sooner is better)

WOUND INFECTIONS IN CHILDREN

Immuno-suppression from chronic parasitic infections or underlying malnutrition greatly affect wound healing and risk of infection

Preventing infection

- Cleaning wound: most important factor
- Antibiotics usually not necessary unless:
  - Wound older than 12 hours
  - Deep penetrating wounds (dirty stick, knife)

WOUND INFECTIONS IN CHILDREN

Wound closure

- Less than 24 hours from injury, cleaned properly: primary closure
- Greater than 24 hours, contaminated or animal bite: do not close
- Wounds not closed primarily should be packed lightly with damp gauze
- If clean after 48 hours, delayed primary closure
- If wound infected, pack lightly, heal by secondary intention

WOUND INFECTIONS IN CHILDREN

- Clinical signs:
  - Pain, swelling, redness, warmth, pus drainage
- Treatment
  - Open wound if pus present or suspected
  - Clean with disinfectant
  - Pack lightly with damp gauze, change daily
  - Antibiotics until cellulitis resolved
    - Staphylococcus: Cloxacillin (25-50mg/kg po qid)
    - Suspected bowel flora : Ampicillin (25-50mg/kg po qid), Gentamycin (7.5 mg/kg IM or IV once a day) and Metronidazole (7.5 mg/kg tid)

TETANUS PROPHYLAXIS

Patient vaccinated: give booster if needed

Patient not vaccinated: give antitetanus serum and start dose of tetanus toxoid vaccine (separate syringes, separate sites)

Antitetanus serum for adults and children

Tetanus immunoglobulin (human) 250 units IM, increased to 500 units if any of the following conditions apply:

- wound older than 12 hours
- presence or risk of heavy contamination
- patient weight more than 90 kg

TETANUS IMMUNIZATION

ADULTS and CHILDREN over 7 years:

- tetanus toxoid (TT) or tetanus and diphtheria vaccine (Td)

CHILDREN under 7 years:

- *Diphtheria and tetanus vaccine* (DT). Higher diphtheria toxoid content

Dose of TT or Td	When to give	Expected duration of protection
1	As early as possible	None
2	At least 4 weeks after TT 1	1-3 years
3	At least 6 months after TT 2	At least 5 years
4	At least 1 year after TT 3	At least 10 years
5	At least 1 year after TT 4	Booster every 10 years

Modified from http://www.who.int/immunization/topics/tetanus/en/index2.html

ANTIBIOTIC PROPHYLAXIS

Indicated for wounds at high risk for infection:

- Contaminated wounds
- Penetrating wounds
- Abdominal trauma
- Compound fractures
- Lacerations greater than 5 cm
- Wounds with devitalized tissue
- High risk anatomical sites—hand, foot