Lecture 1 –
Surgical preparation

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1. Standard instrument set
2. Preparation for surgery
3. Suture Patterns

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1. Standard instrument set

"female set"

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Preparation of instrument pack

- Video: “Female set” preparation
- Video: Folding the drape

Autoclave

- Autoclave is the best option for sterilising instruments
- Pressure cooker can be used in an emergency

Dipping instruments into surgical sprit/any antiseptic is NOT sterilisation of the instruments

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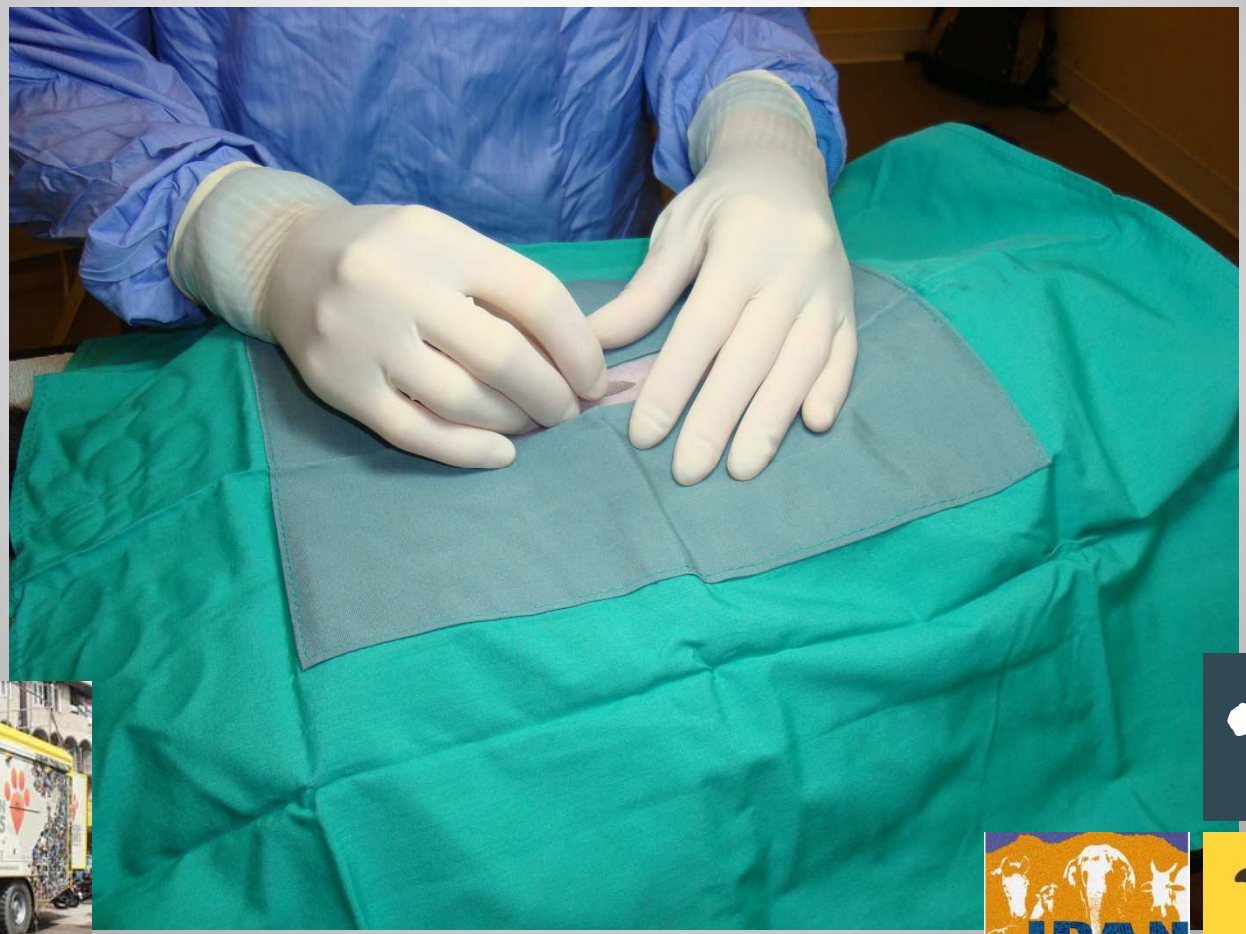
2. Surgical Preparation of Surgeon and Patient



Sources of contamination

- The surgical personnel
- The patient
- The operating environment
- Surgical equipment

- **The cause of surgical wound infection is ALWAYS at the time of the surgery!**

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Surgical Personnel

- A scrubbed surgeon, correctly dressed, rarely contaminates a surgical wound unless one of the barriers to contamination fails

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Non Sterile Barriers

- Scrub suits/ scrub top
- Surgical head cover
- Face masks
- Shoes and shoe covers

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Sterile Barriers

- Gloves
- Gowns
- Surgical Skin Scrub

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Surgeon: preparation

- Mask
- Scrub
- Drying hands
- Gloving

Scrub Solutions

- Povidone Iodine
- Chlorhexidiine

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Povidone Iodine

- Excellent spectrum
- Less residual activity than Chlorhexidine
- Partially inactivated by organic debris
- Occasional skin sensitivity

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Chlorhexidine Gluconate

- Broadest spectrum
- Better residual activity than iodophors
- Occasional skin sensitivity (mucous membranes)

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Video: Hand scrubbing & gloves

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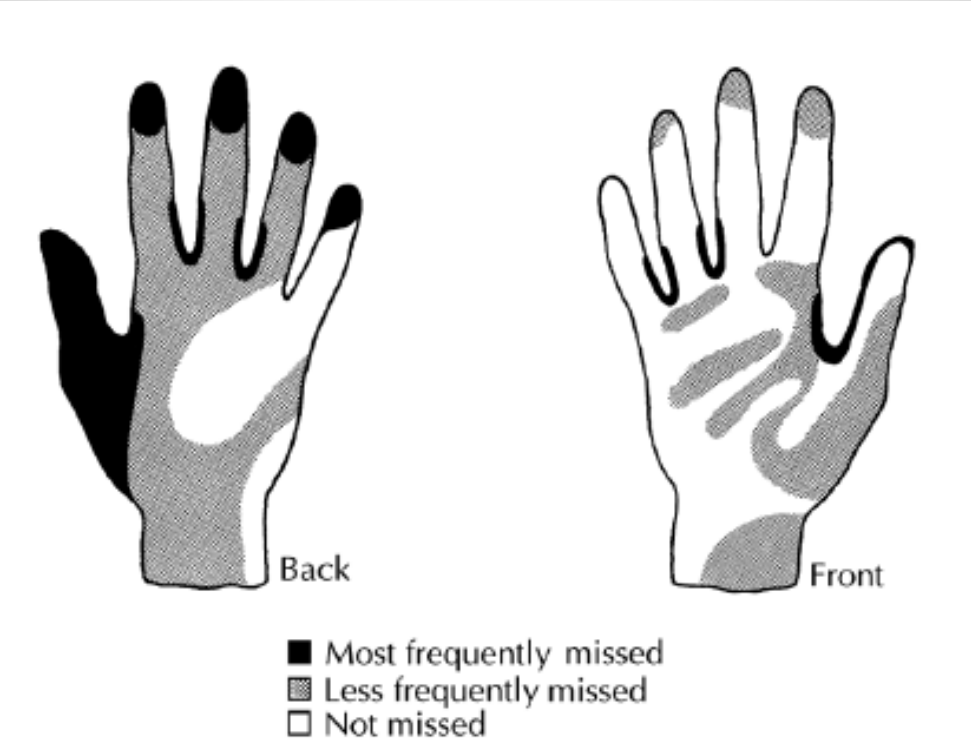
Areas frequently missed during scrubbing



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Maintaining asepsis

- Once the surgical scrub and gloving has been completed, sterility must be maintained.
- Keep hands above the waist and do not touch anything non sterile
- Elbows and other non sterile areas must not be placed on or near the sterile surgical field.

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The Patient

- The patients own microbial flora is the most common source of contamination at the time of surgery

- Proper pre-operative preparation of the patient is the most critical process in reducing wound infection

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Preparation of the Patient

- Hair removal
- Skin preparation
- Patient draping

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Hair Removal

- Perform immediately prior to surgery
- As atraumatic as possible
- Electric clipper or manual shaving blades
- A large area of hair should be removed not just the area over the incision site. This reduces the risk of contamination and allows for an increase in the length of the incision if required.

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Skin Preparation

- Skin cannot be sterilised but the number of bacteria can be minimised.
- Surgical scrub solutions are a mixture of antiseptic and detergent.
- The antiseptic solution provides residual bacteriocidal activity.
- The best and most commonly used solutions are based on chlorhexidine and povidone iodine.

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Skin Preparation

- Apply antiseptic with a swab or cotton wool
- Commence at the incision site and work outwards in a spiral motion
- Do NOT return to the centre
- Repeat until the skin is clean
- Pay attention to the big nibbles of female dogs

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Patient Draping

- Draping reduces the risk of contamination of the surgical site by surrounding hair and skin.
- Try to place the drape with the fenestration in the correct place. Avoid dragging the drape around over the surgery site.
- Ensure your gloves are not contaminated by touching the hair when placing the drape.
- The use of waterproof barrier drapes prior to the sterile surgical drapes is ideal.

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3. Suture patterns

- Surgeons will have their own preferences and so the points made in this lecture are regarded as guide only

Comparison of interrupted and continuous suture patterns

- Interrupted
- Multiple knots so more secure
- Knot is the weakest point of the suture line

- Continuous
- Quicker to close wound
- Less suture material used and buried
- More efficient seal
- Improved spread of tension along wound length

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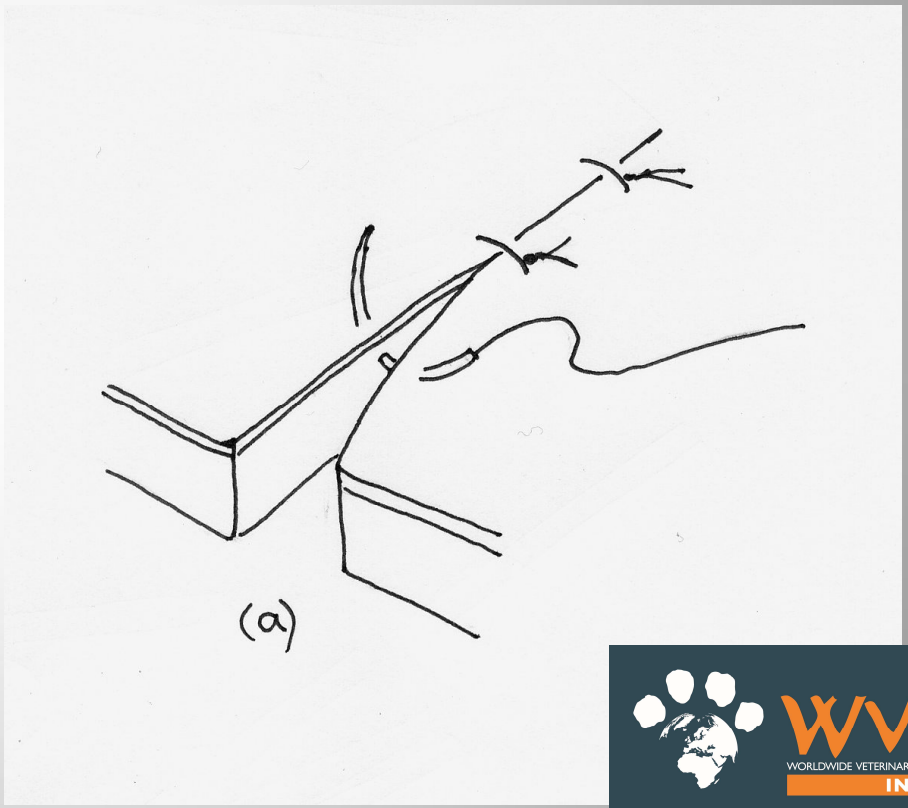
Suture Patterns:

Simple interrupted pattern

- Apply sufficient tension to appose tissue only
- Do not tie knots too tightly
- Leave ends long enough to facilitate removal



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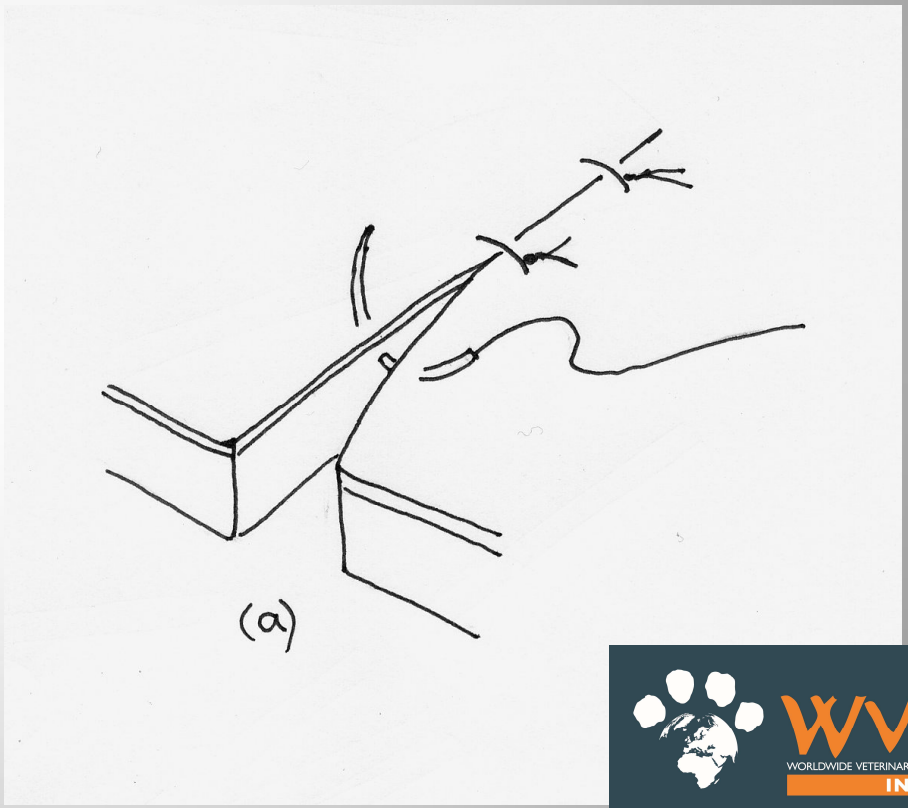
Suture Patterns:

Simple interrupted pattern

- Good apposition
- Less resistant to effects of wound tension



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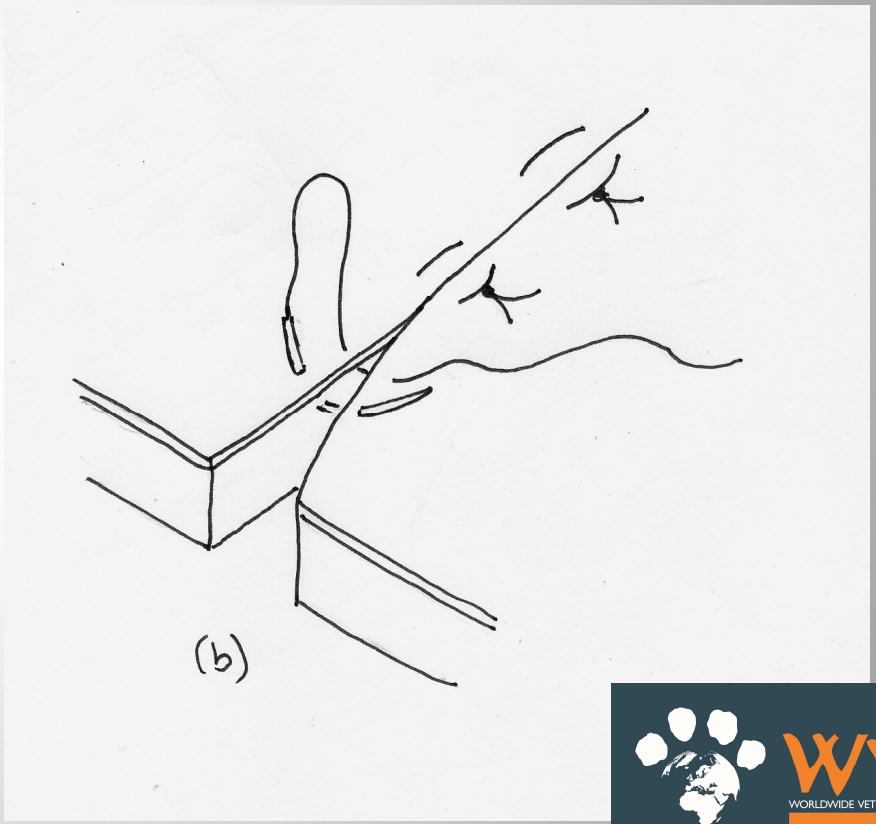
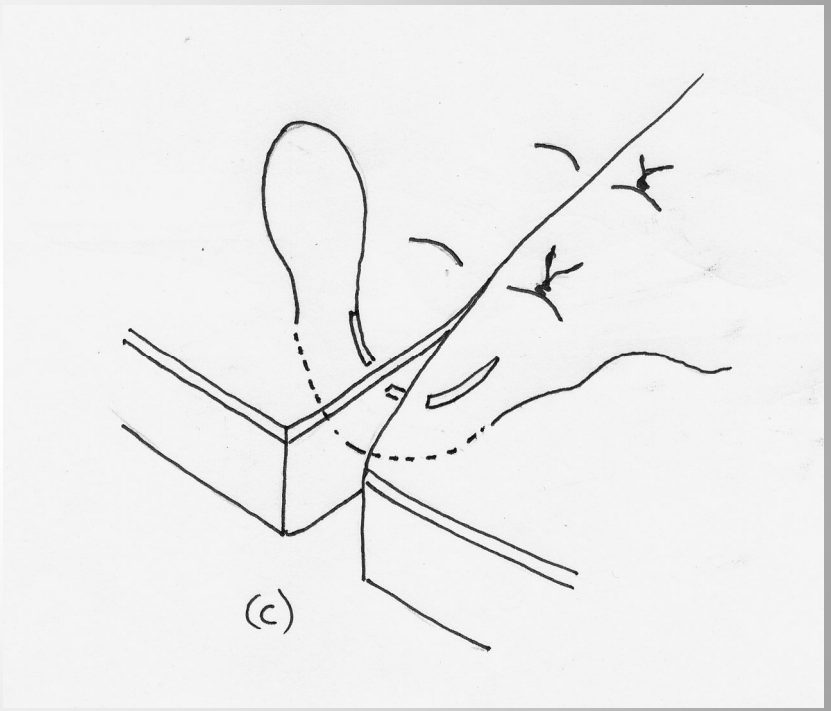
Suture Patterns:
Horizontal mattress

- May be preferred if incision is under some tension
- May produce some eversion of wound edges
- May be some interference with local blood supply



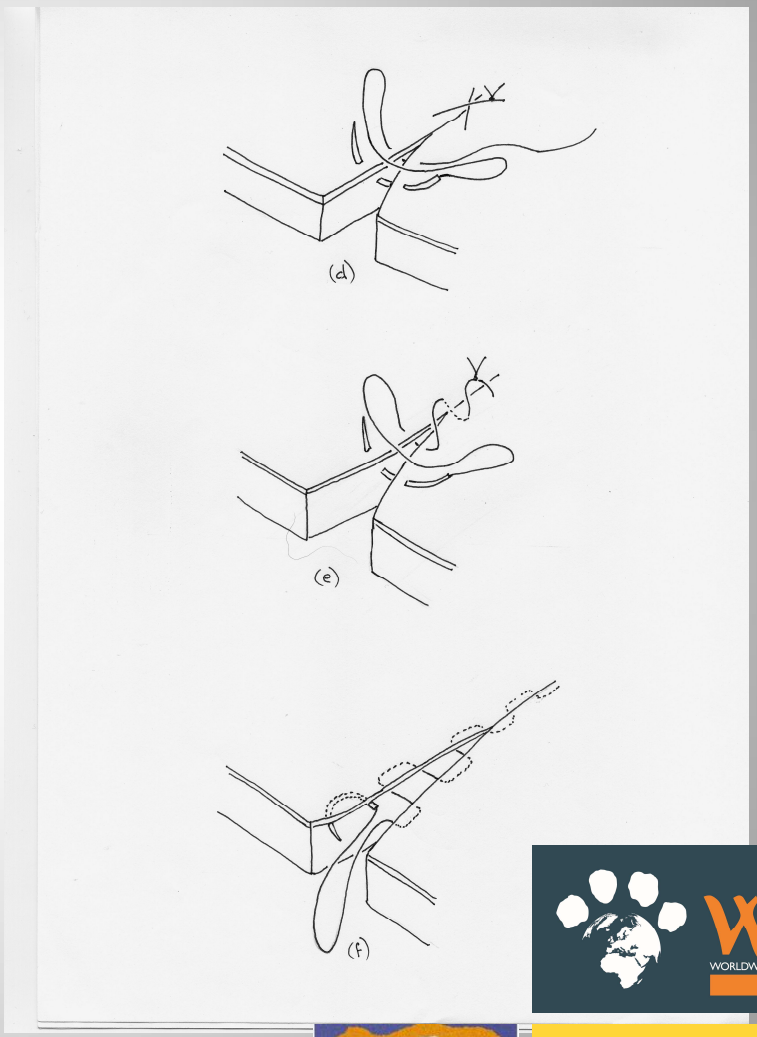
Suture Patterns:
Vertical mattress

- Used in same circumstances as horizontal mattress
- Said to be less risk of ischaemia of skin edges
- Can be used in combination with another pattern for controlling tension



Suture patterns

- D. Cruciate mattress
- E. Simple continuous
- F. Sub-cuticular



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Suture patterns: Cruciate mattress

- Variation of horizontal mattress
- Advantage that resistance to tension with less eversion of wound edges

Suture Patterns: Simple continuous

- Rapid
- Efficient seal
- Safe to use when knots done properly and modern suture materials (PGA or PDS) are used
- **Avoid in skin** as external suture because of the risk of patient interference

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Suture patterns: Subcuticular and intra-dermal

- Slower and requires more care in placement of sutures
- Resists tension
- Avoids patient interference
- Does not require removal – advantage if aggressive or feral
- Improved cosmetic effect
- Aberdeen knot at either end of incision to bury it

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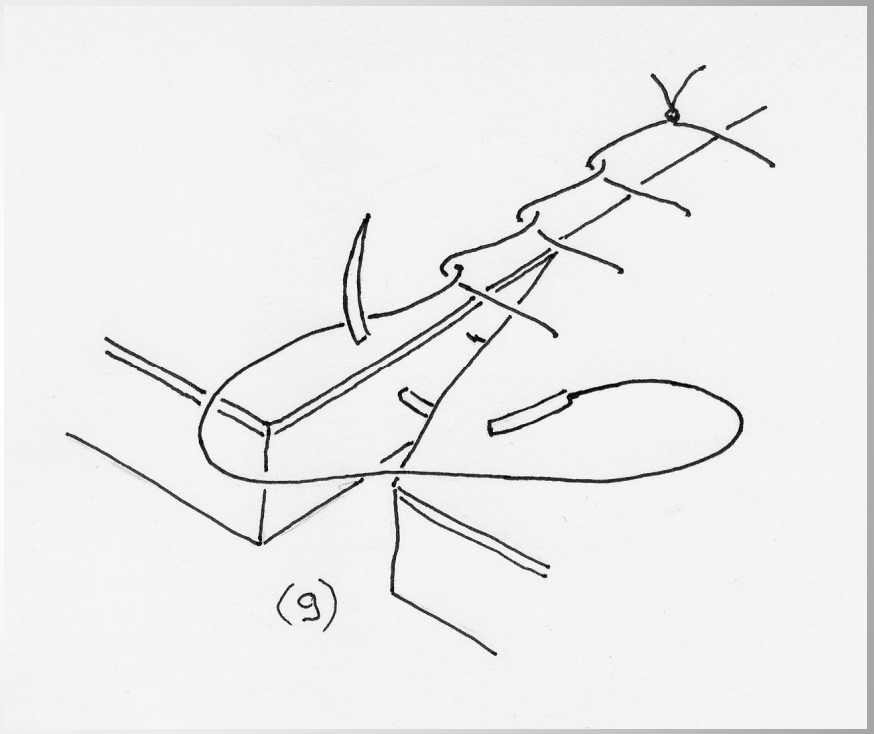
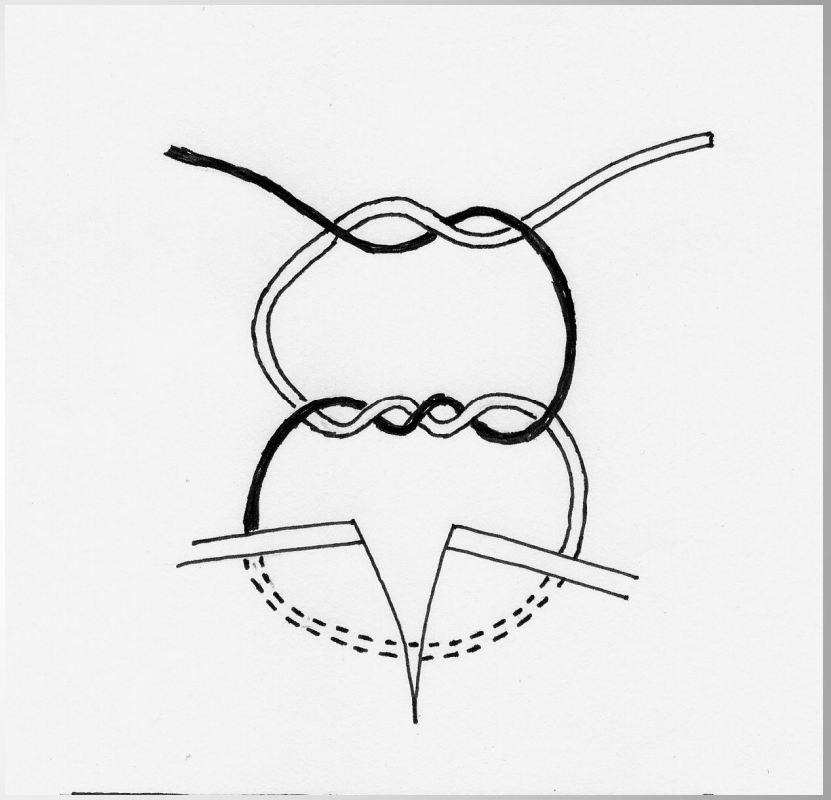
Suture patterns:
Ford interlocking

- Rapid
- Apposition and seal of incision superior to that of simple interrupted
- ? Role in closing long incisions – good for closing long autopsy wounds to make a seal



Surgeon's knot

- Tighten throws gently so as to oppose wound edges only
- Avoid crushing the tissues
- Following surgery there will be a degree of swelling of the incised tissue making the sutures more tight



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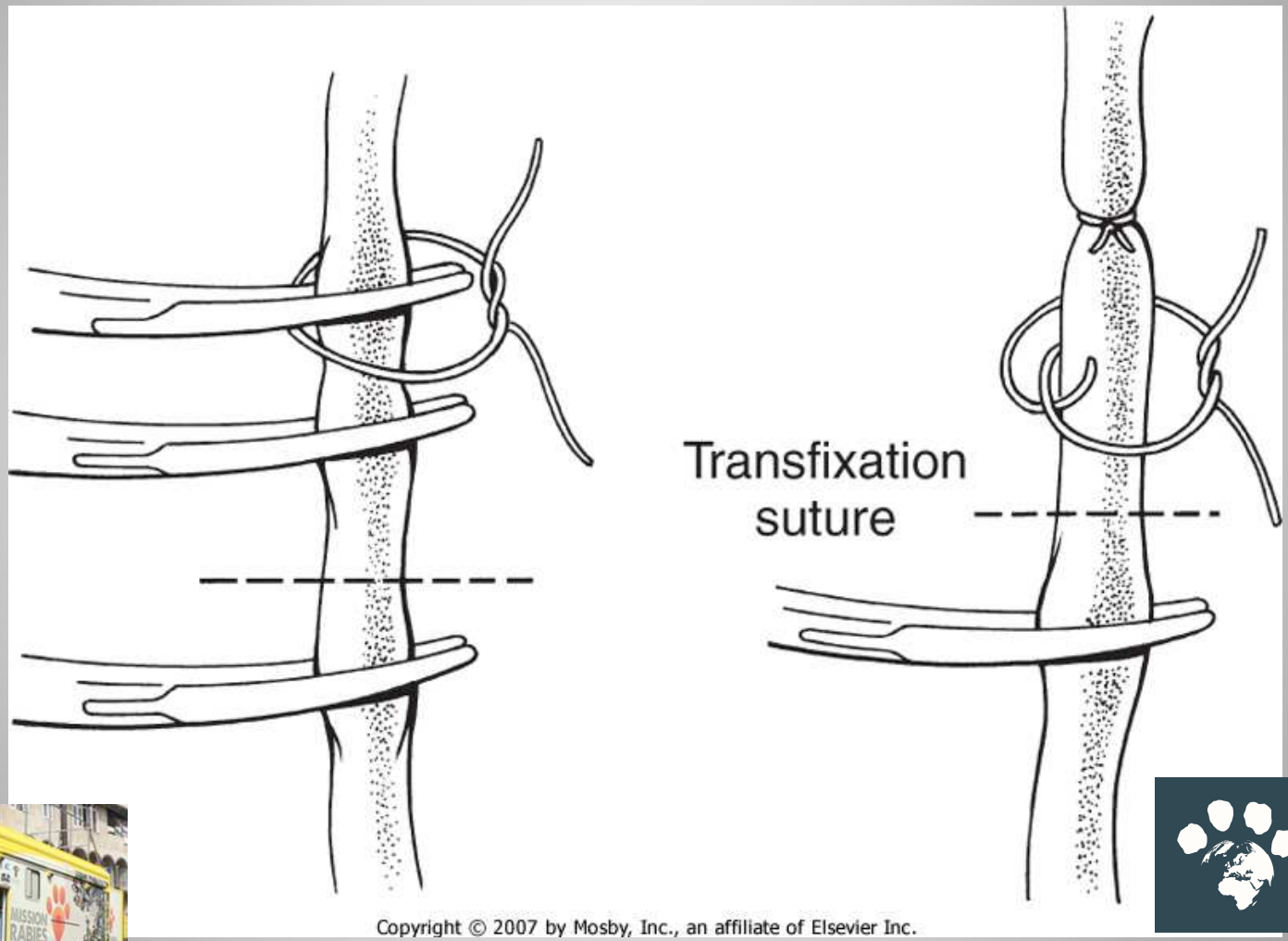
Problems associated with tight sutures

- Local tissue necrosis > inflammation > pain
- Increased incidence of self mutilation by the patient
- Predisposition to local wound infection
- Increased difficulty in suture removal

Ligatures



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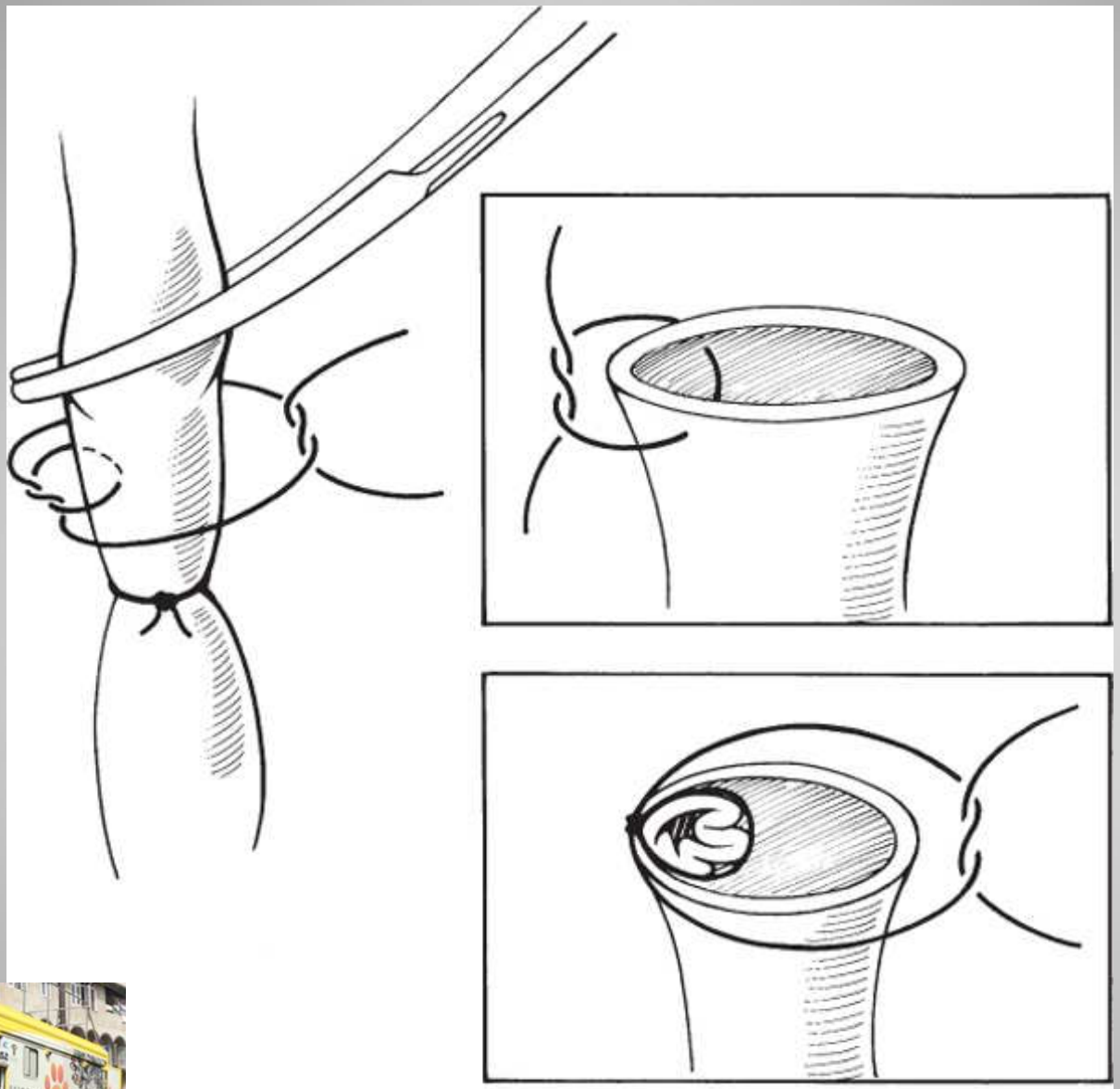

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PRACTICAL

Now, can you make the following:

- Encircling ligature
- Transfixing ligature
- Surgeon's knot
- Simple interrupted pattern
- Simple continuous pattern
- Cruciate pattern
- Intradermal pattern with buried knots

and remember to use correct instrument handling .

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Halstead's principles of surgery

William S Halsted of John Hopkins University put forward a set of principles (Halstedian principles) in the 1890's for achieving the best results in surgery. Now, more than 100 years later, they still form the basis of modern surgical craftsmanship.

- Handle tissues gently
- Achieve meticulous hemostasis
- Preserve vascularity
- Ensure strict asepsis
- Close the wound without tension
- Achieve good approximation of tissues
- Avoid dead space

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Thank You

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