

**Veterinary surgery:**

Is surgery performed on animals by veterinarians, whereby the procedures fall into three broad categories: orthopedics (bones, joints, muscles), soft tissue surgery (skin, body cavities, cardiovascular system, gastrointestinal/urogenital/respiratory tracts), and neurosurgery.

**Classification of veterinary surgery:**

**1- Elective Surgery:** Elective surgery, these are procedures that patients need, but they don't have to be done right away. An elective surgery does not always mean it is optional. It simply means that the surgery can be scheduled in advance. It may be a surgery you choose to have for a better quality of life, but not for a life-threatening condition. But in some cases it may be for a serious condition such as cancer. Examples of elective surgery include removing a mole or wart, and having kidney stones removed. It may also be done if other forms of treatment are not working.

**2- Emergency Surgery:** Urgent or emergency surgery, these are surgeries done for urgent, possibly life-threatening medical conditions, this type of surgery is done because of an urgent medical condition. The condition may even be life threatening. Examples are acute appendicitis, trauma (serious injuries from an accident), and testicular torsion.

**Tenets of Halsted:**

Also known as Halsted's principles are the basic principles of surgical technique regarding tissue handling. These key points were introduced in the late 19th century by William Stewart Halsted, co-founder of Johns Hopkins Hospital.

- **Gentle handling of tissue.**
- **Control hemorrhage** (Meticulous hemostasis).

- **Preservation of blood supply.**
- **Strict aseptic technique.**
- **Minimum tension on tissues.**
- **Accurate tissue apposition.**
- **Obliteration of dead-space.**

### **1. Gentle handling of tissue:**

Surgery is invasive by definition. Yet we should strive to minimize iatrogenic trauma to tissues. Thumb or tissue forceps should be used to grab tissues delicately, as opposed to crushing them. Whether we use sharp or blunt dissection, it should be as accurately anatomical as possible. Ironically, gentle tissue handling also means using a scalpel blade correctly. Once the beginning and end of the incision are identified, a scalpel should be used to make a single incision in a single pass to the appropriate depth.

Being wishy-washy or using a scalpel like a paint brush is much more traumatizing to the skin because the incision will have jagged edges. In addition, the blade should be kept perpendicular to the skin to ensure proper tissue apposition during suturing.

### **2. Control hemorrhage:**

We should do our best to prevent or stop bleeding using meticulous hemostasis. Electrocautery, ligatures and hemostatic agents are some of the many ways to control bleeding.

### **3. Preserve blood supply:**

Preserving the blood supply is a direct consequence of careful dissection. While many blood vessels, including large ones, can be sacrificed, we should strive to preserve them when possible as they will help with healing. This is especially important with

fracture repairs. For example, muscles should be elevated from the bone fragments only if necessary so to avoid delayed healing or creating a sequestrum.

#### **4. Observe strict asepsis techniques:**

Surgical asepsis encompasses preparation of instruments, the patient, the practitioner and the staff. This is why we recommend wearing caps, masks, gowns and gloves to perform surgery. Also, thorough scrubbing of the patient, the surgeon and any assistant is critical. The smallest mistake during any step of this continuum may lead to an infection. At best, it may be an incisional infection. At worst, it can be disastrous when it involves orthopedic implants.

#### **5. Minimize tissue tension:**

Excessive tension during suturing of organs like the intestines, bladder and skin is unnecessary, if not detrimental. Applying sutures is an art form. They can't be too tight—crushing and pressure necrosis could result—and they must allow postoperative swelling. At the same time, they can't be too loose, which could cause leakage or dehiscence.

#### **6. Appose tissues accurately:**

The purpose of wound closure is to bring the edges together to allow healing. Again, this applies, among others, to the intestines, bladder and skin. This is very different from strangulation or crushing, which may have been suggested in the past (e.g. in the intestine) but is now universally discouraged. Overlapping of the edges of an incision is not recommended.

**7. Eliminate dead space:**

This is a corollary to the previous principle except that it mostly relates to muscle and skin closure. In other words, after a laparotomy, we should eliminate dead space by carefully suturing the different layers of the abdominal incision. After excision of a large tumor, eliminate dead space to decrease the risk of seroma or hematoma formation.

If needed, a passive or an active drain should be used if bleeding or drainage is anticipated. By preventing fluid accumulation, we allow tissue layers to adhere to one another, thereby speeding up healing.