SUTURE PATTERN

A suture is a thread used for uniting the wound edges; suture is also used to denote the pattern of suture. Suture pattern is broadly classified into interrupted suture and continuous suture. The special sutures fall into any one of the categories. Another classification is as follows: Apposition suture, Inversion suture, Eversion suture, and Special suture (will be taken in semester 3 with specific topics).

Apposition Suture:
Apposition sutures are those sutures that bring the wound edges close together, or in contact and promote faster healing. eg. Simple interrupted suture, Simple continuous suture are examples for this.

**Simple interrupted suture:** The suture penetrates one edge of wound from outside and goes to the other edge pierces it from the underneath and comes out on the skin of the other edge of wound the knot is tied and the excess suture is cut and removed. It is used on skin and muscles and peritoneum. It has the advantage of remaining intact even one or two bites open up but disadvantages are time consuming and wastage of suture materials. See Fig 1. Though it takes longer time it is highly recommended for suturing muscles and peritoneum to avoid wound opening up when bites are removed by patient specially in some dogs and cats.

![Simple interrupted suture](image1)

**Simple continuous suture:** The suture starts with simple interrupted suture and the subsequent stitches are continued with the same thread till the stitching is over. Bite is taken similar to simple interrupted suture but knotting is done at the start and end only. Through the tissue the suture passes perpendicular to the wound edges and the exposed part of the suture runs diagonal to the wound edges. It is used on muscles and peritoneum. See Fig 2. but should be avoided on these tissues for the fear of wound opening up if one bite is broken. Therefore this suture may be used only to close gap between skin and fascia or to close ‘dead’ space.

![Simple continuous suture](image2)
Inversion suture:
These are the suture patterns, which causes the inversion of the wound edges into the lumen of the tubular organs like gastro-intestinal tract, uterus etc. inversion sutures are used on hollow organs to bring the serosal layers in contact to promote faster healing in these organs eg. Cushing suture, Connell suture, and Lembert’s suture

Lembert’s suture: Take a bite on one side of wound (direction of needle should be perpendicular to line of incision) cross over to the other side of the wound and take another bite in the same direction, tie a knot, wound edges will invert immediately. Go onto the same side where you started and do the same. Through the tissue the suture runs perpendicular to the wound edges while the exposed portion of the suture runs diagonal to the wound edges. Fig 3

Cushing suture: The suture starts with Lembert’s and after knotting the bites are taken parallel to wound edges alternately on either sides until the end. Through the tissue the suture runs parallel to the wound edges and the exposed part of the suture runs perpendicular to the wound edges. The suture does not penetrate the mucous layer (mucosa) of the organ. See Fig 4.

Connell suture: The suture starts with Lembert’s and after knotting the bites are taken parallel to wound edges alternately. Through the tissue the suture runs parallel to the wound edges and the exposed part of the suture runs perpendicular to the wound edges unlike Cushing’s suture it penetrates the mucous layer (mucosa) of the organ. See Fig 5. this suture is not recommended for use in surgery for fear of dragging out contents from lumen of organs.
**Eversion suture:** These are the suture patterns which when applied causes the wound edges to evert out. This suture pattern is used on skin so that the outer surface of the skin do not come in contact and hinder healing due to hair growth. eg. Vertical mattress suture, Interrupted horizontal mattress suture.

*Vertical mattress suture:* suture needle penetrates on one side near to the wound edge and goes to other side from inside and comes out onto skin near the wound edge too. Next the needle direction is reversed but penetrates on the same line little lateral to previous bite and passes through tissues and comes out onto other side almost at the same distance lateral to previous bite and a knot is tied between two free ends produced. The exposed portion as well the buried portion of the suture runs perpendicular to the wound edges. It is usually used as the relaxation suture Fig 6.

*Interrupted horizontal mattress suture:* needle first penetrates on one side from out and goes through the tissues and comes out on the other side, needle is moved down parallel wound edge for a small distance and penetrates back and comes out on the side where it started and two free ends are knotted to make one complete suture. These process are repeated until whole wound is closed. The exposed portion of the suture runs parallel to the wound edges and through the tissue the suture runs perpendicular to the wound edges see Fig 7.