RAMA UNIVERSITY

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FACULTY OF NURSING

SUTURES

DEFINITION, CLASSIFICATION, TYPES

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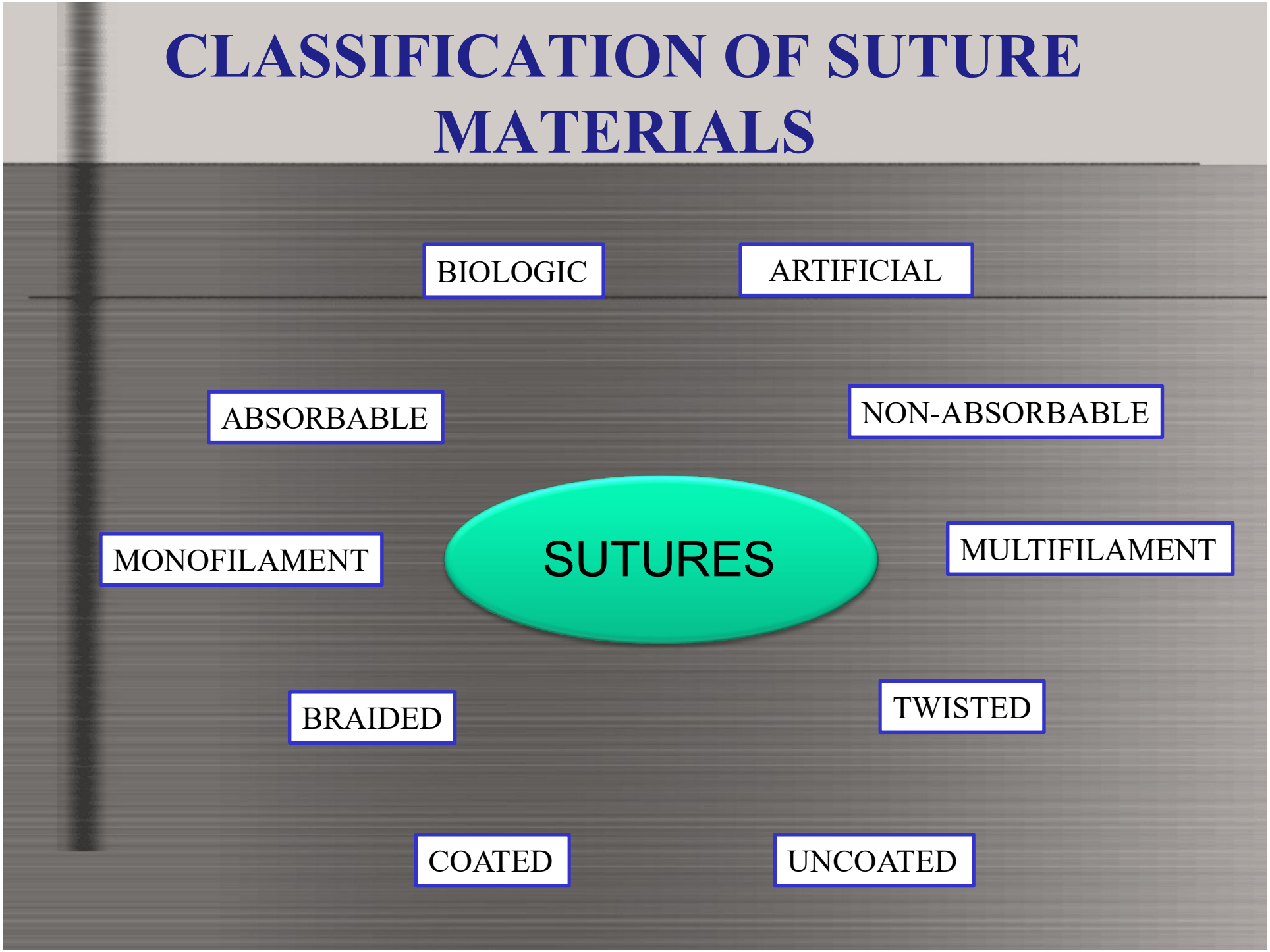
DEFINITION

- A suture is a strand of material which is used to ligate blood vessels and to approximate tissues together.
- To suture is the act of sewing or bringing tissues together and holding them in apposition until healing has taken place.

GOALS OF SUTURING

- Healing by primary intention
- Minimal scarring
- Maximal esthetic and functional results

CLASSIFICATION OF SUTURE MATERIALS



TYPES OF SUTURE MATERIALS

- NATURAL FIBRES

ABSORBABLE

PLAIN GUT

CHROMIC GUT

PLAIN COLLAGEN

CHROMIC COLLAGEN

NONABSORBABLE

SILK

COTTON

LINEN

TYPES OF SUTURE MATERIALS

- SYNTHETIC FIBERS

ABSORBABLE

POLYGLYCOLIC ACID
POLYGALACTIN 910
POLYDIOXANONE
POLYGLYCONATE

NONABSORBABLE

NYLON
POLYESTER
POLYPROPYLENE
DACRON

REQUISITES OF IDEAL SUTURE MATERIAL

- Adequate strength
- Good handling and knot tying characteristics
- Little tissue reaction
- Low capillarity
- Sterilisable

PROPERTIES-ABSORBABLE SUTURES

CATGUT:

Oldest absorbable suture material

derived from Sheep intestinal submucosa

degradation-proteolytic enzymes of phagocytic cells

ADVANTAGES:

Undergoes easy absorption

DISADVANTAGES:

Isopropyl alcohol – irritant to soft tissues
Evokes inflammatory reaction
Stiff
Least tensile strength

CHROMIC GUT

- Plain gut treated or tanned with chromic salts

ADVANTAGES:

Prolonged suture strength

Resistant to proteolytic enzymes

Less stimulation of tissue reaction

Increased tensile strength

POLYGLACTIN 910

- Synthetic absorbable suture
  derived from: Copolymer of glycolide and lactide
  Derivative of hydroxyacetic acid

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  High molecular weight linear
  chain polymer

  ↓

  Long chains of polymer braided
  into suture material
- Coated with polyglactin370 and calcium stearate

- *ADVANTAGES:*
  - Strongest
  - No enzymatic break down
  - Less stiff
  - Less irritant
  - Metabolites are bactericidal
- *DISADVANTAGES:*
  - Difficulty in tying the knot
  - Expensive

COLLAGEN

- Derived from grinding the native collagen of deep flexor tendons of cattle.

- *ADVANTAGES:*

  Uniform physical characteristics

- *DISADVANTAGES:*

  Premature absorption

NON-ABSORBABLE SUTURES

- SILK :

Natural, non-absorbable suture material

Advantages:

Easiest to handle

Excellent tensile strength

Minimal tissue reaction

Convenient color difference from oralmucosa

Inexpensive

Disadvantages:

Lowest knot holding ability

Multifilamentous- greatest capillarity

NYLON

- Synthetic, non-absorbable
- Available as both monofilament and braided form.
- Advantages:
  - Minimal tissue reaction
  - High coefficient of friction
  - Least stiff
  - Good tensile strength
- Disadvantages:
  - Braided form harbors bacteria
  - Property of memory
  - Tears through non-keratinised tissues

COTTON AND LINEN

- Derived from non-continuous material fibers of cotton and linen

- Properties:
  - Strength and tissue reaction are similar to silk
  - Handling characters are inferior

METALS

Stainless steel

Monofilament

Tantalum

Multifilament

INDICATIONS:

1. Scar revision in keloid forming patients
2. Suspension of splints or arch bars

- ADVANTAGES:
  1. Strongest
  2. Greatest tensile strength
  3. The most secured knot
- PROPERTIES:

  Undergo degradation through corrosion

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  Tissue reaction

SUTURE SIZES

- Largest size – 1-0
- Extremely fine – 11-0
- Increase in number of zeroes

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Decrease in the diameter and strength of the suture

- Commonly used sutures in maxillofacial procedures are 3-0 or 4-0 sutures

STERILISATION OF SUTURES

- Lister was the first to sterilise sutures
- Sterilised using 2.5 megarads of gamma radiation or ethylene oxide
- In the past sterilised using autoclave or by boiling- loss of tensile strength.