PHARM.D • YEAR 2

Pharmacognosy & Phytopharmaceuti

CHAPTER 15

Plant Fibers Used in Surgical Dressings and Related Products

PPT CHAPTER COVER



DOCTOR OF PHARMACY

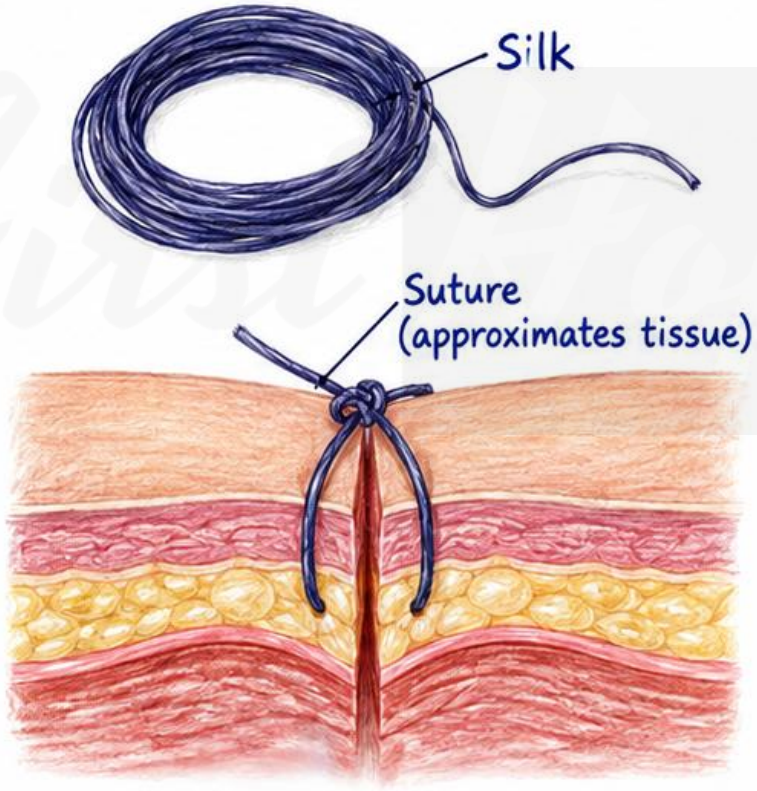
Fibres: material determines the role

Surgical materials can be grouped by source and chemistry.

Cotton and rayon are cellulose-based fibres used mainly for absorbent dressings.



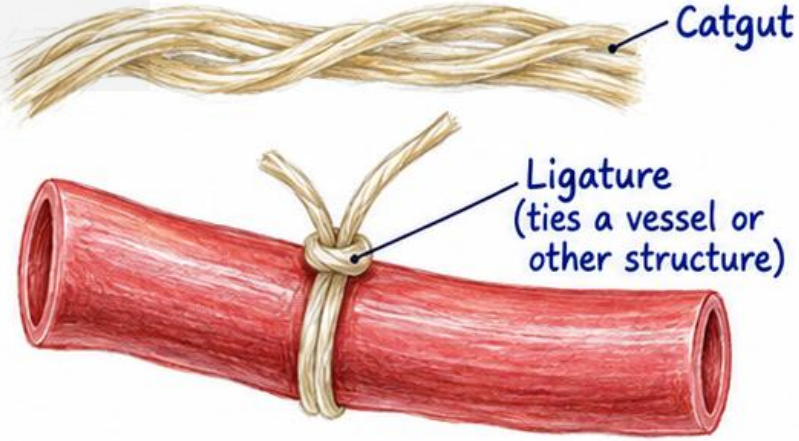
Silk is an animal protein fibre used in sutures and ligatures.



Wool contains keratin and is useful chiefly for cushioning and padding.



Catgut is collagen-based material used as a natural absorbable suture.



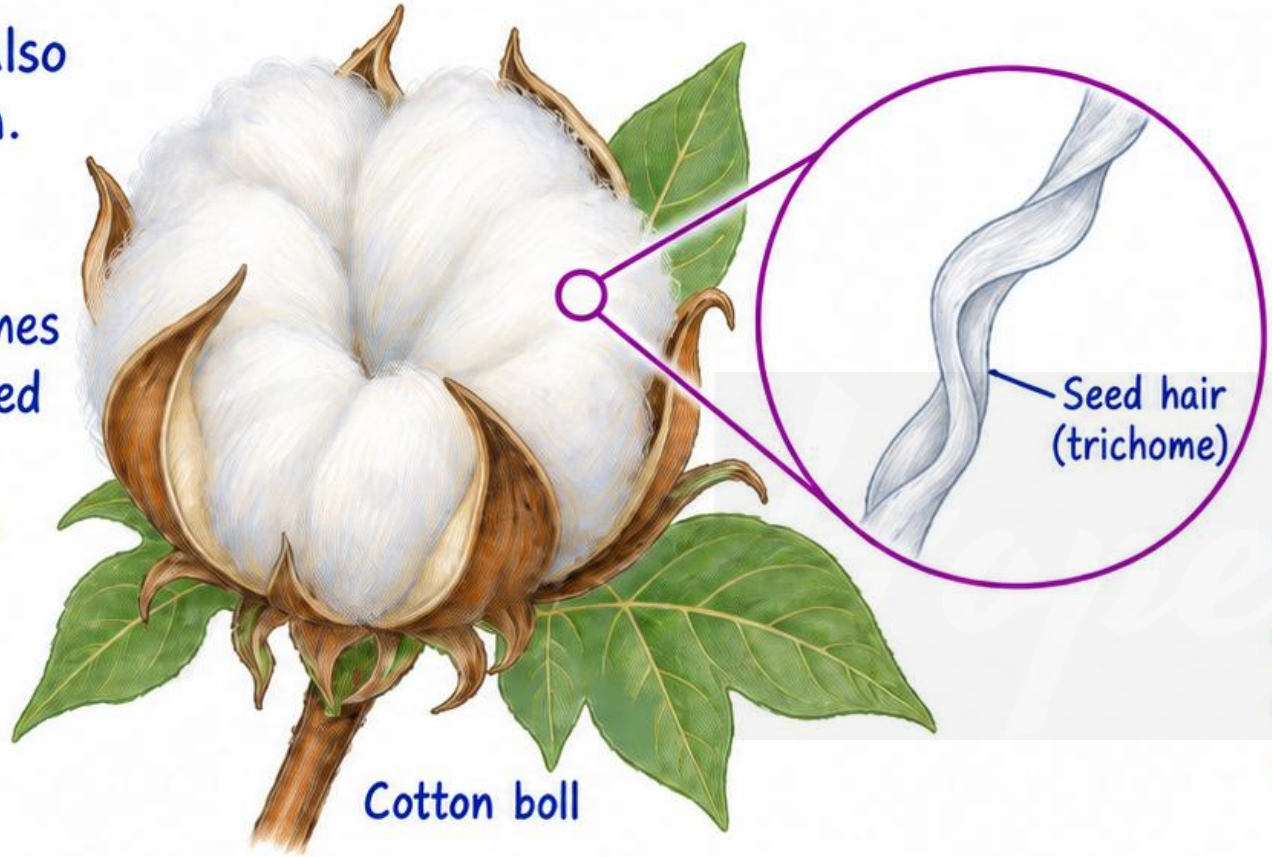
A dressing covers or protects tissue; a suture approximates tissue; a ligature ties a vessel or other structure. These are different functions, even when fibres look similar.

Cotton: seed hairs of Gossypium

Absorbent cotton is also called surgical cotton.

Biological source:
dried epidermal trichomes from seeds of cultivated Gossypium species, especially *G. hirsutum* and *G. barbadense*.

Family: Malvaceae.





Purification removes much of the non-cellulosic material and improves absorbency for dressing manufacture.

Chemical constituents:
Cotton consists mainly of cellulose; raw fibre commonly contains about 91-96% cellulose with minor waxes, proteins, pectins and mineral matter.

Cellulose:
Cellulose is a linear polysaccharide of beta-D-glucose joined by beta-1,4 linkages.



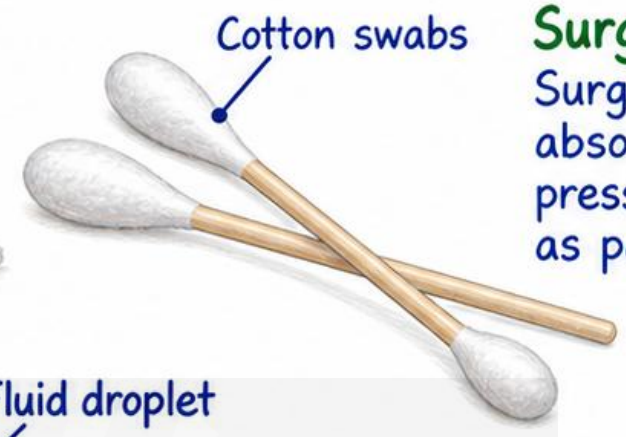
Cellulose chain (schematic)

Cotton in absorbent dressings



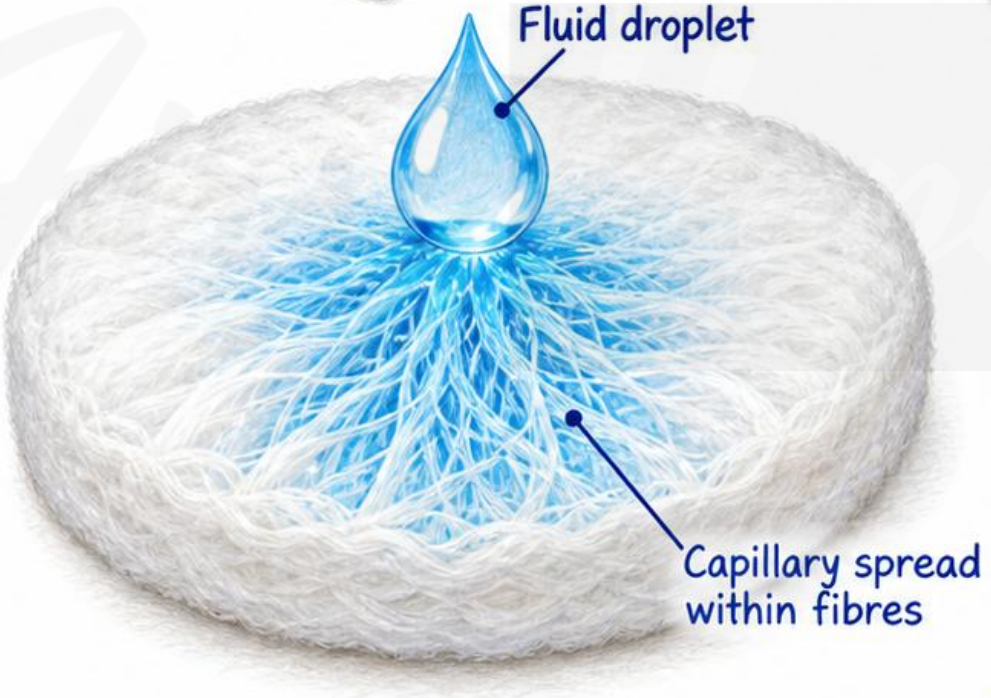
Purified cotton combines softness with fluid uptake and is used for pads, swabs, rolls and bandaging products.





Surgical uses

Surgical uses include cleaning, absorbing fluids and supporting pressure-based haemostasis as part of a suitable dressing.





Other products

Other products include medicated cotton, tampons, cosmetic pads and absorbent sanitary materials.



Sterility and quality

Absorbent does not automatically mean sterile: sterility depends on the supplied product and its processing.

Clean packaging, low contamination and appropriate absorbency are essential quality features for the intended application.

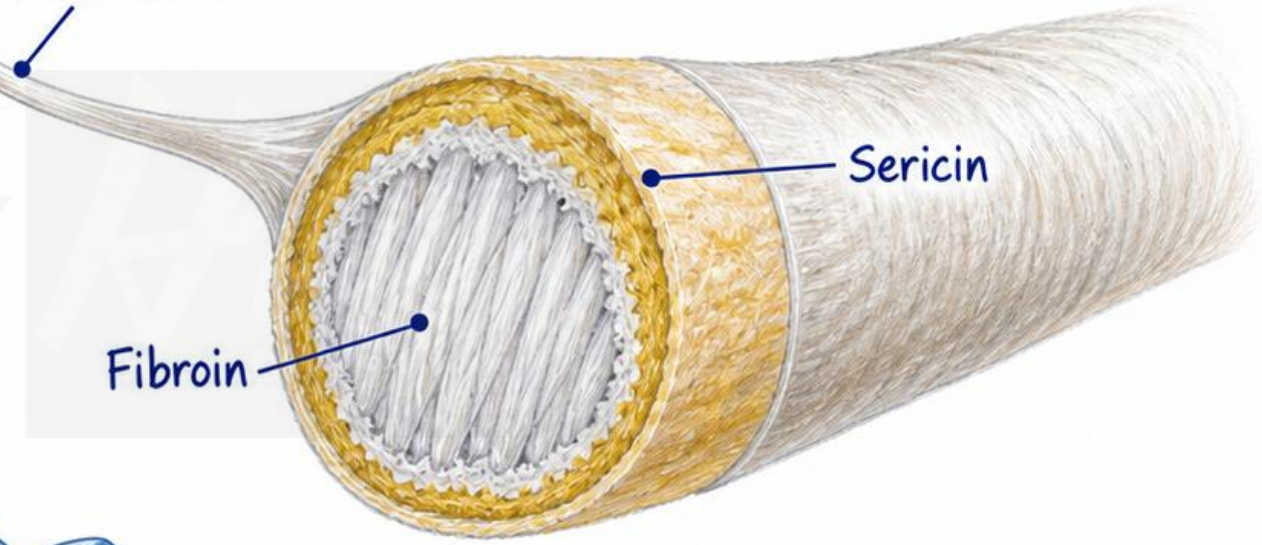
Silk: fibroin from the cocoon



Source and identity

Silk is an animal protein fibre obtained from the cocoon of the silkworm *Bombyx mori*.

Family: Bombycidae.



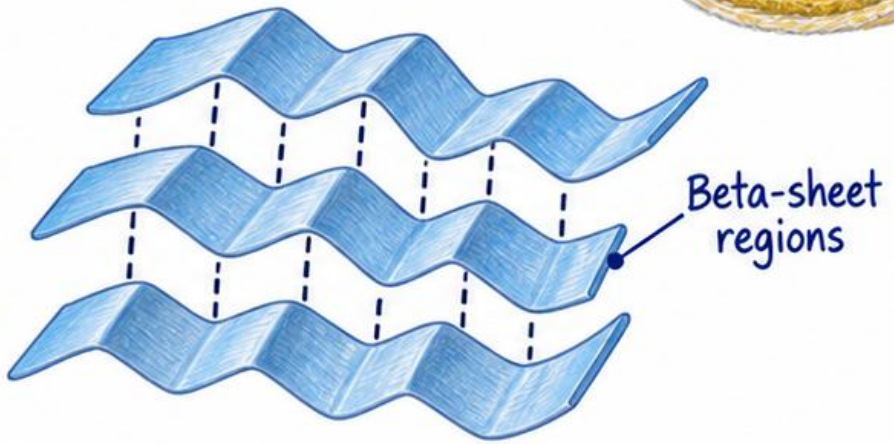
Composition

Raw silk contains fibroin, roughly 70-80%, surrounded by a sericin coating, roughly 20-30%.

Chemistry and structure

Fibroin is a fibrous protein rich in glycine, alanine and serine.

Its ordered beta-sheet regions help explain the fibre's strength.



Processing

Processing removes much of the gummy sericin coating before silk is prepared for specialised products, including surgical sutures.

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