

# 11 Materials for Absorbable and Nonabsorbable Surgical Sutures: A Comprehensive Guide

Surgical sutures play a crucial role in wound closure, providing strength, support, and facilitating the healing process. They come in a wide range of materials, each with unique properties that suit different surgical applications. This article provides a comprehensive overview of 11 commonly used materials for absorbable and nonabsorbable surgical sutures.

## Absorbable Sutures

### 1. Natural Materials



## Biotextiles as medical implants: 11. Materials for absorbable and nonabsorbable surgical sutures (Woodhead Publishing Series in Textiles)

by Sara Goodman Confino

★★★★★ 5 out of 5

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\* **Catgut (Collagen):** Derived from the submucosal layer of sheep's intestines, catgut is highly absorbable and provides good tensile strength early on. It degrades by enzymatic hydrolysis, leaving no permanent material in the body. \* **Silk (Sericin):** Obtained from the cocoon of the silkworm, silk is a moderately absorbable suture with excellent knot security and minimal tissue reactivity. It degrades slowly, over several months to years.

## 2. Synthetic Materials

\* **Polyglycolic Acid (PGA):** A synthetic polymer, PGA is rapidly absorbed (within 60-90 days) thanks to its simple structure. It is ideal for superficial wounds and mucosal tissues. \* **Poly-lactic Acid (PLA):** Closely related to PGA, PLA offers slightly slower absorption (within 120-180 days). It provides good strength and is commonly used in wound closure and cosmetic surgery. \* **Polydioxanone (PDS):** A crystalline polymer, PDS is characterized by its excellent wound healing properties. It absorbs slowly (within 180-240 days) and maintains tensile strength for an extended period.

## Nonabsorbable Sutures

### 1. Natural Materials

\* **Cotton:** A plant-based material, cotton is strong, flexible, and nonabsorbable. It is commonly used in dentistry, skin closure, and ligatures. However, it can elicit a foreign body reaction and inflammation. \* **Linen:** Derived from the flax plant, linen is another nonabsorbable suture with high tensile strength. It is less reactive than cotton but more expensive.

## 2. Synthetic Materials

\* **Nylon:** A polyamide polymer, nylon is characterized by its exceptional strength, elasticity, and low tissue reactivity. It is nonabsorbable and suitable for a wide range of surgical procedures. \* **Polyethylene (PE):** A lightweight and inert material, PE is well-suited for cardiovascular surgery, ophthalmology, and plastic surgery. It provides low friction and high knot strength. \* **Polypropylene (PP):** Similar to PE, polypropylene is a nonabsorbable synthetic suture with high resistance to infection and chemical degradation. It offers excellent knot security and is often used in hernia repair and abdominal surgery.

### Choosing the Right Suture Material

The selection of the appropriate suture material depends on various factors, including:

\* **Wound Type and Location:** Absorbable sutures are recommended for wounds that will heal quickly, while nonabsorbable sutures are preferred for permanent closure or where prolonged support is needed. \* **Tissue Reactivity:** Synthetic sutures generally elicit less tissue reaction compared to natural materials. \* **Tensile Strength:** The suture material should provide sufficient strength to withstand the tension of the wound. \* **Biocompatibility:** The suture should not cause any adverse reactions or toxicity within the body. \* **Cost:** Suture materials vary in price, which can influence the selection based on budget constraints.

The choice of surgical suture material is a critical aspect of successful wound closure. By understanding the properties and applications of different materials, surgeons can select the most appropriate suture for

each surgical procedure. With the wide range of absorbable and nonabsorbable sutures available, there is a suitable option for every type of wound and surgical need.



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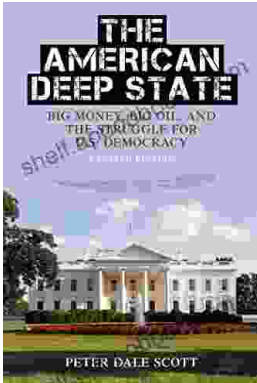
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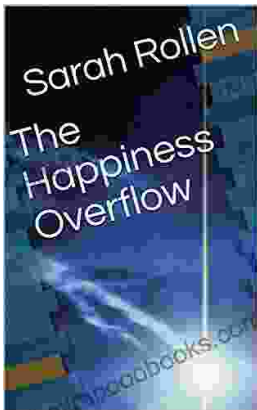
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