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Non-Absorbable Sutures for General Surgery, Orthopedic Surgery, or Gynecological Surgery: Clinical Effectiveness, Cost- Effectiveness, and Guidelines

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Research Questions

1. What is the clinical effectiveness of non-absorbable sutures made from one material compared with non-absorbable sutures made from an alternative material for adult patients undergoing surgery?
2. What is the cost-effectiveness of non-absorbable sutures made from one material compared with non-absorbable sutures made from an alternative material for adult patients undergoing surgery?
3. What are the evidence-based guidelines for the use of non-absorbable sutures in adult patients undergoing surgery?

Key Findings

No literature was identified regarding the clinical effectiveness or cost-effectiveness of non-absorbable sutures made from one material compared with non-absorbable sutures made from an alternative material for adult patients undergoing surgery. No evidence-based guidelines were identified regarding the use of non-absorbable sutures in adult patients undergoing surgery.

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including Medline via OVID, the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concept was non-absorbable sutures. Filters were applied to limit the retrieval to health technology assessments, systematic reviews, and meta analyses, randomized controlled trials, and non-randomized studies, economic studies, and guidelines. The search was also limited to English language documents published between January 1, 2015 and October 19, 2020. Internet links are provided where available.

Selection Criteria

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. Open access full-text versions of evidence-based guidelines were reviewed when abstracts were not available.

Table 1: Selection Criteria

Population	Adult patients undergoing general surgery, orthopedic surgery, or gynecological surgery
Intervention	<p>Non-absorbable sutures made from one material (monofilament or multifilament or braided) Materials include, but are not limited to:</p> <ul style="list-style-type: none"> - Polypropylene (e.g., Surgipro Suture or Surgipro II, Prolene) - Polyester (e.g., Ti-cron, Ethibond excel, Surgidac, Mersilene) - Polybutester (e.g., Vasculfil, Novafil) - Hexafluoropropylene-vinylidene fluoride (e.g., Pronova)

	<ul style="list-style-type: none"> - Steel and stainless steel (e.g., Flexon) - Nylon (e.g., Monosof or Dermalon, Surgilon, Nurolon) - Silk (e.g., Sofsilik) <p>Excluding wound closure devices such as V loc.</p>
Comparator	Non-absorbable sutures made from a different material (any material noted under intervention)
Outcomes	<p>Q1: Clinical effectiveness (e.g., infection rates, safety, breaking or fraying of sutures leading to improper wound healing, wound healing)</p> <p>Q2: Cost-effectiveness (e.g., incremental cost effectiveness ratios)</p> <p>Q3: Recommendations regarding the choice of non-absorbable material for sutures in general surgery, orthopedic surgery, or gynecological surgery; recommendations regarding best practices for non-absorbable sutures in general surgery, orthopedic surgery, or gynecological surgery)</p>
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines

Results

No health technology assessments, systematic reviews, randomized controlled trials, or non-randomized studies were identified regarding the clinical effectiveness of non-absorbable sutures made from one material compared with non-absorbable sutures made from an alternative material for adult patients undergoing surgery. No economic evaluations were identified regarding the cost-effectiveness of non-absorbable sutures made from one material compared with non-absorbable sutures made from an alternative material for adult patients undergoing surgery. No evidence-based guidelines were identified regarding the use of non-absorbable sutures in adult patients undergoing surgery.

References of potential interest that did not meet the inclusion criteria are provided in the appendix.

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

No literature identified.

Economic Evaluations

No literature identified.

Guidelines and Recommendations

No literature identified.

Appendix — Further Information

Systematic Review & Meta-Analyses

Alternative Comparator

1. Pacella E, Mipatrini D, Pacella F, et al. Suspensory materials for surgery of blepharoptosis: a systematic review of observational studies. *PLoS ONE [Electronic Resource]*. 2016;11(9):e0160827.
[PubMed: PM27631781](#)

Randomized Controlled Trials

Alternative Population

2. Jamali H, Abuali M, Khalili MR. Clinical outcomes of silk versus nylon sutures for suturing of conjunctival autograft in pterygium surgery. *Middle East Afr J Ophthalmol*. 2020 Apr-Jun;27(2):110-116.
[PubMed: PM32874044](#)

Non-absorbable Suture Not Specified

3. Peleg D, Ahmad RS, Warsof SL, Marcus-Braun N, Sciaky-Tamir Y, Ben Shachar I. A randomized clinical trial of knotless barbed suture vs conventional suture for closure of the uterine incision at cesarean delivery. *Am J Obstet Gynecol*. 2018 03;218(3):343.e341-343.e347.
[PubMed: PM29496259](#)

Non-Randomized Studies

Unclear Suture Classification

4. Dragovic M, Pejovic M, Stepic J, et al. Comparison of four different suture materials in respect to oral wound healing, microbial colonization, tissue reaction and clinical features-randomized clinical study. *Clin Oral Investig*. 2020 Apr;24(4):1527-1541.
[PubMed: PM31342245](#)

No Comparator

5. Abdullah A, Memon I, Ahmed SF, Muhammad A, Anwar A. Surgical management of male incontinence, with Prolene mesh fixing with Prolene sutures; a prospective novel study for the treatment of male incontinence at tertiary care hospital. *J Ayub Med Coll Abbottabad*. 2019 Jul-Sep;31(3):331-335.
[PubMed: PM31535500](#)
6. Ursulescu A, Baumann P, Ferrer MT, et al. Optilene, a new non-absorbable monofilament is safe and effective for CABG anastomosis. OPTICABG - a prospective international, multi-centric, cohort study. *Ann Med Surg (Lond)*. 2018 Nov;35:13-19.
[PubMed: PM30258627](#)

Review Articles

7. Nahas FX, Faustino LD, Ferreira LM. Abdominal wall plication and correction of deformities of the myoaponeurotic layer: focusing on materials and techniques used for synthesis. *Aesthet Surg J*. 2019 03 14;39(Suppl_2):S78-S84.
[PubMed: PM30869750](#)

Additional References

8. Turner RC. Surgical management of acute lacerations. *Aus J Gen Pract*. 2019 Sep;48(9): <https://www1.racgp.org.au/ajgp/2019/september/surgical-management-of-acute-lacerations> Accessed 2020 Oct 26.
See: Choice of Suture Material