

WHO Surgical Site Infection Prevention Guidelines

Web Appendix 22

Summary of a systematic review on the changing of surgical instruments

1. Introduction

Surgical site infection (SSI) is caused by microorganisms either from the patient's own skin flora or from the environment surrounding the patient. In both cases, there is a potential for microorganisms to adhere to surgical instruments and consequently contaminate the incisional wound, particularly during contaminated surgical procedures. Therefore, it is common practice to exchange surgical instruments used in contaminated surgical procedures for a non-previously used, clean set of surgical instruments before wound closure.

Current SSI prevention guidelines do not address the exchange of surgical instruments prior to wound closure and its effect to prevent SSI. The objective of this systematic review was to assess the effectiveness of this practice.

2. PICO question

By the time of wound closure, is there a difference in SSI when instruments are changed for fascial, subcutaneous and skin closure using a new set of sterile instruments?

- **Population:** inpatients and outpatients of any age undergoing contaminated surgical operations
- **Intervention:** wound closure employing a new set of sterile surgical instruments
- **Comparator:** wound closure with previously-used surgical instruments
- **Outcomes:** SSI, SSI-attributable mortality

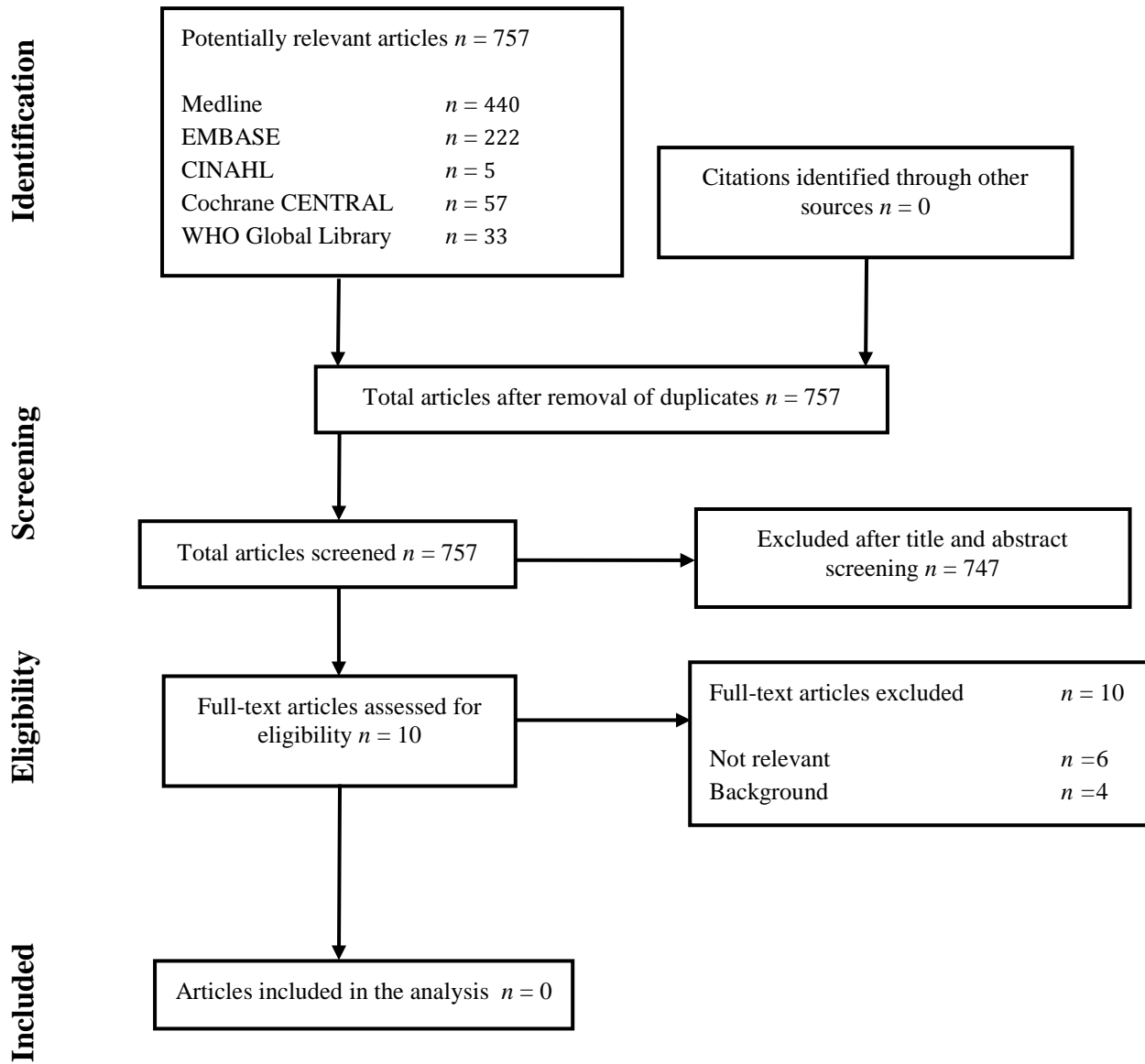
3. Methods

The following databases were searched: Medline (PubMed); Excerpta Medica Database (EMBASE); Cumulative Index to Nursing and Allied Health Literature (CINAHL); Cochrane Central Register of Controlled Trials (CENTRAL); and WHO regional medical databases. The time limit for the review was between 1 January 1990 and 31 December 2014. Language was restricted to English, French and Spanish. A comprehensive list of search terms was used, including Medical Subject Headings (MeSH) (Appendix 1).

Two independent reviewers screened the titles and abstracts of retrieved references for potentially relevant studies. The full text of all potentially eligible articles was obtained and two authors then independently reviewed these for eligibility based on inclusion criteria. Duplicate studies were excluded.

4. Study selection

Flow chart of the study selection process



5. Summary of the findings and quality of the evidence

The literature search did not identify any studies comparing wound closure in contaminated surgery using new, sterile surgical instruments to wound closure with previously-used surgical instruments.

Two studies (one randomized controlled trial ¹ and one observational study ²) were identified that investigated the change of instruments in colorectal surgery in combination with other interventions performed before wound closure, including changing of drapes, gowns and gloves, wound lavage and rescrubbing (not homogeneous in terms of interventions). Both studies showed no benefit for the prevention of SSI.

6. Key uncertainties and future research priorities

The systematic review team identified the following key uncertainties and future research priorities.

As there is no direct evidence of the effectiveness of this measure, well-designed randomized controlled trials investigating the change of instruments prior to wound closure would be welcome. Studies should be conducted in high-, low- and middle-income countries and include different surgical procedures. All studies should be designed as a randomized controlled trial with the SSI outcome defined according to the United States Centers for Disease Control and Prevention criteria.

APPENDICES

Appendix 1: Search terms

Medline (via PubMed)

- #1 "surgical wound infection"[Mesh] OR surgical site infection* [TIAB] OR "SSI" OR "SSIs" OR surgical wound infection* [TIAB] OR surgical infection*[TIAB] OR post-operative wound infection* [TIAB] OR postoperative wound infection* [TIAB] OR wound infection*[TIAB]
- #2 "surgical instruments"[Mesh] OR surgical instrument* [TIAB] OR ((surgery OR surgical) AND (clip [TIAB] OR clips [TIAB] OR clamp OR clamps [TIAB] OR scissors [TIAB] OR hook [TIAB] OR hooks [TIAB] OR blade [TIAB] OR blades [TIAB]))
- #3 Step 1 AND Step 2 AND ("1990/01/01"[PDat] : "2014/12/31"[PDat])))

EMBASE

- #1 surgical infection/ or (surgical site infection* or SSI or SSIs or surgical wound infection* or surgical infection* or post-operative wound infection* or postoperative wound infection*).ti,ab,kw.
- #2 surgical instruments.mp. or exp surgical equipment/
- #3 surgical instrument.mp.
- #4 surgery.ti,ab,kw
- #5 clips.mp.
- #6 clamps.mp.
- #7 exp scissors/ or scissors.mp.
- #8 hook.mp.
- #9 hooks.mp.
- #10 blade.mp.
- #11 blades.mp.
- #12 5 or 6 or 7 or 8 or 9 or 10 or 11
- #13 4 and 12
- #14 2 or 3 or 13
- #15 1 and 14
- #16 limit 15 to yr="1990 - current"
- #17 limit 16 to exclude Medline journals

CINAHL

- #1 (MH "wound infection+") OR "wound infection" OR (MH "surgical wound infection")
- #2 surgical instrument OR ((clamp OR clip OR hook OR scissor OR blade OR hook) AND surgery)
- #3 #2 OR #1

Cochrane CENTRAL

- #1 wound infection:ti,ab,kw
- #2 surgical wound infection:ti,ab,kw
- #3 surgical instrument OR((clamp OR clip OR hook OR scissor OR blade OR hook) AND surgery)
- #4 #1 or #2
- #5 #4 AND #3

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((ssi) OR (surgical site infection) OR (surgical site infections) OR (wound infection) OR (wound infections)) AND ((surgical instrument) OR ((surgery) AND (clip OR clamp OR hook OR scissor OR blade)))

ti: title; ab: abstract.

References

1. Ortiz H, Armendariz P, Kreisler E, Garcia-Granero E, Espin-Basany E, Roig JV, et al. Influence of rescrubbing before laparotomy closure on abdominal wound infection after colorectal cancer surgery: results of a multicenter randomized clinical trial. *Arch Surg.* 2012;147:614-20.
2. Ghuman A, Chan T, Karimuddin AA, Brown CJ, Raval MJ, Phang PT. Surgical site infection rates following implementation of a colorectal closure bundle in elective colorectal surgeries. *Dis Colon Rectum.* 2015;58:1078-82.