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## Critically Appraised Articles

### Absorbable sutures containing triclosan decrease wound infection rates in children

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**English key words:** suture techniques, triclosan, surgical wound infection, childhood.

**Palabras clave en español:** técnicas de sutura, triclosán, infección de herida operatoria, niños.

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# Absorbable sutures containing triclosan decrease wound infection rates in children

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**Original article:** Renko M, Paalanne N, Tapiainen T, Hinkkainen M, Pokka T, Kinnula S, *et al.* Triclosan-containing sutures versus ordinary sutures for reducing surgical site infections in children: a double-blind, randomized controlled trial. *Lancet Infect Dis.* 2017;17:50-7.

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## Abstract

**Authors' conclusions:** in agreement with what is known for adult patients, the use of absorbable sutures containing the antiseptic triclosan in children, compared to conventional ones, effectively reduces the incidence of surgical wound infections.

**Reviewers' commentary:** even in populations with a low prevalence of surgical wound infections, the use of absorbable sutures containing triclosan versus conventional sutures reduces the presence of this complication by about half. More safety and cost-effectiveness studies in childhood are needed to recommend its use widely.

**Key words:** suture techniques, triclosan, surgical wound infection, childhood.

**Las suturas absorbibles que contienen triclosán disminuyen las tasas de infección de la herida quirúrgica en los niños**

## Resumen

**Conclusiones de los autores del estudio:** en concordancia con lo ya sabido en cuanto pacientes adultos, la utilización de suturas absorbibles que contienen el antiséptico triclosán en niños reduce eficazmente la incidencia de infecciones de la herida quirúrgica en comparación con las convencionales.

**Comentario de los revisores:** aun en poblaciones de baja prevalencia de infecciones de la herida quirúrgica, la utilización de suturas absorbibles que contienen triclosán frente a las convencionales reduce a cerca de la mitad la presencia de dicha complicación. Serían precisos más estudios de seguridad y coste-efectividad en la infancia para recomendar ampliamente su utilización.

**Palabras clave:** técnicas de sutura, triclosán, infección de herida operatoria, niños.

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## STRUCTURED ABSTRACT

**Objective:** To investigate whether the use of triclosan-containing sutures in paediatric patients unselected by surgery could lead to a clinically relevant reduction in the occurrence of surgical site infections (SSIs).

**Design:** randomised, double-blind, controlled trial.

**Setting:** University hospital with a Paediatric Surgery Department in Oulu, Finland.

**Study sample:** children aged less than 18 years admitted to hospital for any type of elective or emergency surgery and with anticipated use of absorbing sutures. Out of 2124 patients that met the inclusion criteria, 1633 agreed to participate and were randomly allocated. Children undergoing surgical correction of the foreskin or a cleft lip or palate were excluded due to the use of sutures with shorter resorption times that were not available with triclosan. Also excluded were patients from the neonatal and paediatric intensive care units (ICUs) and the oncological ward because their baseline risks for infection were too different and there were too few

of these surgeries to be analysed as a subgroup. Losses to followup were similar and of less than 10% in both groups.

**Intervention:** monofilament or multifilament sutures were used based on the desired absorption times, coated with triclosan in the intervention group (IG) and uncoated in the control group (CG). A statistician that was not involved in the study performed the randomised allocation of patients: 802 patients allocated to the IG and 813 to the CG. Twenty-one and twenty percent of patients in these groups, respectively, did not receive the assigned treatment and were excluded from the per-protocol analysis. Patients, surgeons, staff in the operating room and individuals in charge of evaluating surgical wounds were blinded to the type of suture.

**Outcome measures:** the primary outcome was the occurrence of a deep or superficial SSI in the 30 days following the operation and according to the criteria of the CDC. In the post-hoc analysis, the authors compared the frequency of wound dehiscence, the number of positive bacterial cultures from surgical site samples, the number of required antimicrobial courses and the number of unplanned visits to a nurse or physician. The authors presented the results of the intention-to-treat and per-protocol analyses.

**Main results:** there were no differences in the baseline characteristics of the two groups. Six surgeons performed 77% of the interventions, but a total of 69 participated in the study. The intention-to-treat analysis found that SSIs occurred in 3% of the IG (n = 778) compared to 5% of the CG (n = 779) (risk ratio [RR], 0.48; 95% confidence interval [95 CI], 0.29 to 0.81), which resulted in a number needed to treat (NNT) with this type of suture of 36 children (95 CI, 21 to 111) to prevent one SSI. In the per protocol analysis, SSIs occurred in 3% of patients in the IG (n = 636) compared to 6% in the CG (n = 651) (RR: 0.47; 95 CI, 0.27 to 0.81) (NNT\*, 32; 95 CI, 19 to 108). Adverse events were similar in both groups (sutures not resorbing in the expected time frame in 6%).

**Conclusion:** consistent with the findings of previous studies in adults, the use of triclosan-coated absorbable sutures is effective in reducing the occurrence of SSIs in paediatric patients.

**Conflicts of interest:** explicitly disclosed by the authors.

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## COMMENTARY

**Justification:** surgical site infections are a frequent complication of surgery. They result in increases in length of stay, antimicrobial use, morbidity and mortality. Sutures with triclosan, an antiseptic used to reduce the risk of infection, have been used in adults, but there are few studies on their use in children, which is the subject of the work reviewed in this article.<sup>1</sup>

**Scientific rigour/validity:** the trial was designed around a clearly defined research question. The methodology of the study minimised the risk of bias. The results are relevant, precise, and have statistical power. The authors performed a modified intention-to-treat analysis that included unjustified losses. The conclusions are based on the observed outcomes. The results and conclusions do not seem to be influenced by competing interests. The results of the study can be generalised to the population and context of interest; however, most of the patients in the sample had elective surgery and the study was conducted in a single hospital.

**Clinical relevance:** triclosan-coated sutures are effective in reducing surgical site infections in children, with an absolute risk reduction (intention-to-treat analysis recalculated for 802 patients in the IG and 813 in the CG) of 2.7% (95 CI, 0.8% to 4%), a number needed to treat of 37 children to prevent one SSI (95 CI, 22% to 125%) and a RR of 48% (95 CI, 29% to 81%). This is an important effect for any type of surgery. This measure can reduce costs. In a study on sternal wounds, Fleck et al<sup>2</sup> concluded that the use of triclosan-coated sutures results in an added cost of 9 dollars per patient, which is considerably lower than the cost of treating infection. When it comes to triclosan toxicity, Clyton et al<sup>3</sup> expressed concern on its long-term effects on immunity.

In this study, the number of patients included for different types of surgery varied, and we cannot conclude that the intervention is effective in all operations requiring sutures. A multicentric randomised controlled trial in adults<sup>1</sup> did not find a reduction in infection associated with the use of triclosan-coated sutures. Furthermore, the study we are reviewing was conducted in a single centre and involved few surgeons that mainly performed elective surgeries, which may lead to overestimation of treatment effects.<sup>4</sup>

**Applicability to clinical practice:** in populations with a low prevalence of surgical site infections, the use of triclosan-containing absorbable sutures compared to conventional sutures reduces the incidence of this complication by nearly half. Further studies on safety and cost-effectiveness are required to recommend their widespread use.

**Conflicts of interest:** the authors of the commentary have no conflicts of interest to declare.

\* Figure calculated by reviewers with data provided by authors of original article.

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