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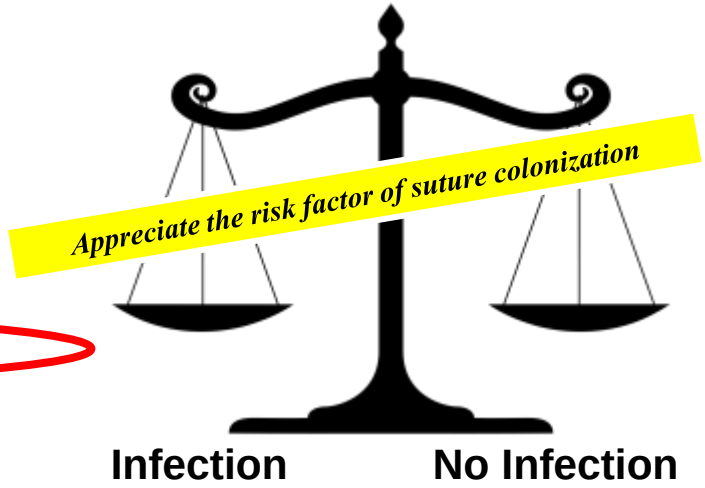
Plus Antibacterial Sutures

ETHICON

Balancing SSI Risk Factors with Interventions[1,2]

Bacteria on Personnel	Masks, gowns, scrub in
Bacteria on Patient	Pre-op bathing, skin prep
Bacteria in Environment	Sterile surfaces
Bacteria on Tools	Sterile equipment
Bacteria on Suture	Antibacterial suture
Diabetes	?
Obesity	?
Malnutrition	?
Polypharmacy	?



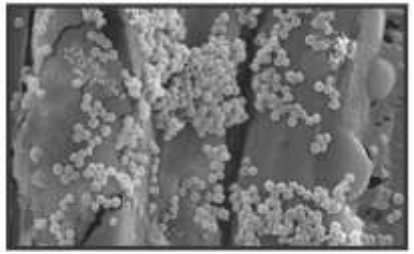
1. National Collaborating Centre for Women's and Children's Health. Surgical site infection: prevention and treatment of surgical site infection. Clinical Guideline. October 2008. **2.** World Health Organization. WHO Guidelines for Safe Surgery 2009.

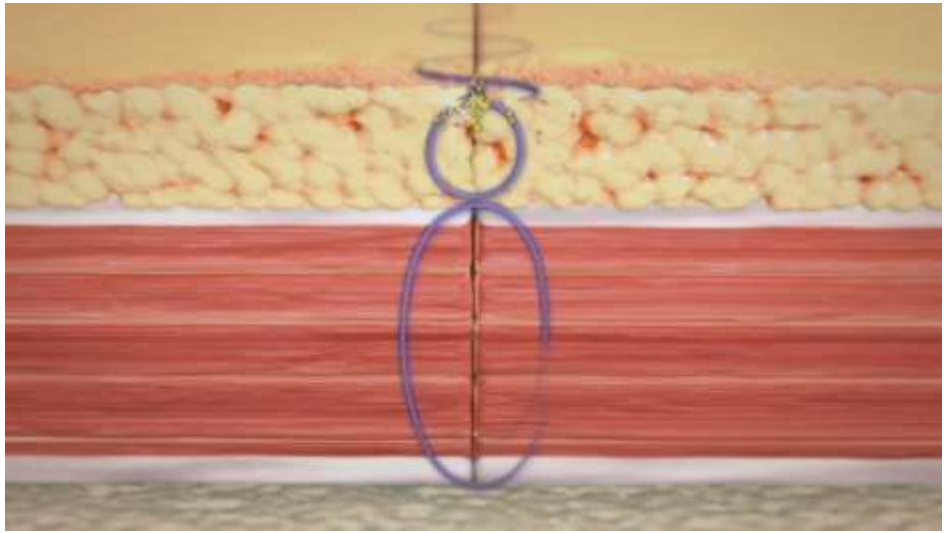
Implants Can Increase Risk of Infection

- Like all implants, sutures can be colonized by **bacteria**, which can lead to **biofilm formation**[1]

Colonization of a suture knot

Colonization of a braided suture

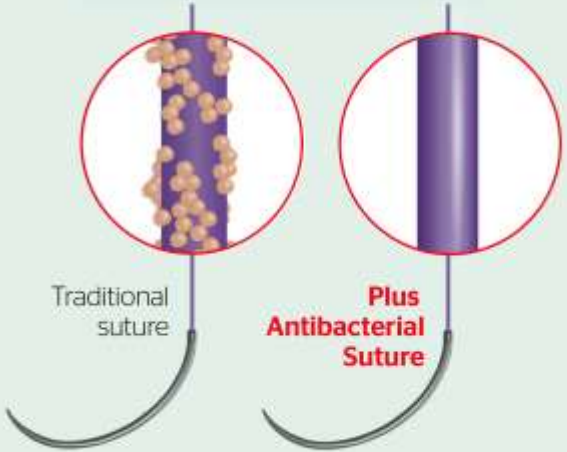




1. Mangram et al. Infect Control Hosp Epidemiol. 1999;20:250

Plus Antibacterial Suture

Suture selection provides an important opportunity to address a known risk factor for infection: bacterial colonization of the suture.



Plus Antibacterial Sutures have been shown in vitro to inhibit bacterial colonization of the suture for 7 days or more, for protection against the most common organisms associated with SSI.[4-9]

- ✓ *Staphylococcus aureus*
- ✓ *Staphylococcus epidermidis*
- ✓ Methicillin-resistant *Staphylococcus aureus* (MRSA)
- ✓ Methicillin-resistant *Staphylococcus epidermidis* (MRSE)
- ✓ *Escherichia coli*[†]
- ✓ *Klebsiella pneumoniae*[†]

[†]PDS Plus Suture and MONOCRYL Plus Suture only

The petri dish image is for illustrative purposes only, zone of inhibition testing results can vary.

4. Hendley JO, Ashe KM. E¸ect of topical antimicrobial treatment on aerobic bacteria in the stratum corneum of human skin. Antimicrobial Agents and Chemotherapy. 1991;35(4):627˜631. 5. Ward KH, Olson ME, Lam K, Costerton JW. Mechanism of persistent infection associated with peritoneal implants. J Med Microbiol. 1992;36(6):406˜413. 6. Kathju S, Nistico L, Hall-Stoodley L, et al. Chronic surgical site infection due to suture-associated polymicrobial bio°ilm. Surg Infect (Larchmt). 2009;10(5):457˜461. 7. Rothenburger S, Spangler D, Bhende S, Burkely D. In vitro antimicrobial evaluation of Coated VICRYL* Plus Antibacterial Suture (coated polyglactin 910 with triclosan) using zone of inhibition assays. Surg Infect (Larchmt). 2002;3(Suppl 1):S79˜S87. 8. Ming X, Rothenburger S, Yang D. In vitro antibacterial e˜ïcacy of MONOCRYL plus antibacterial suture (poliglecaprone 25 with triclosan). Surg Infect (Larchmt). 2007;8(2):201˜207. 9. Ming X, Rothenburger S, Nichols M. In vivo and in vitro antibacterial e˜ïcacy of PDS plus (polidioxanone with triclosan) suture. Surg Infect (Larchmt). 2008;9(4):451˜457.

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Triclosan-coated sutures now recommended

Three globally recognized health authorities now recommend the use of triclosan-coated sutures for SSI prevention

1. Berríos-Torres SI, Umscheid CA, Bratzler DW, et al. Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017. JAMA Surg. doi:10.1001/jamasurg.2017.0904. 2. WHO Global Guidelines for the Prevention of Surgical Site Infection, 2016. 3. Ban KA, Minei JP, Laronga C, et al. American College of Surgeons and Surgical Infection Society: Surgical Site Infection Guidelines, 2016 Update. J Am Coll Surg. 2016;224:59-74.

Hierarchy of Scientific Evidence

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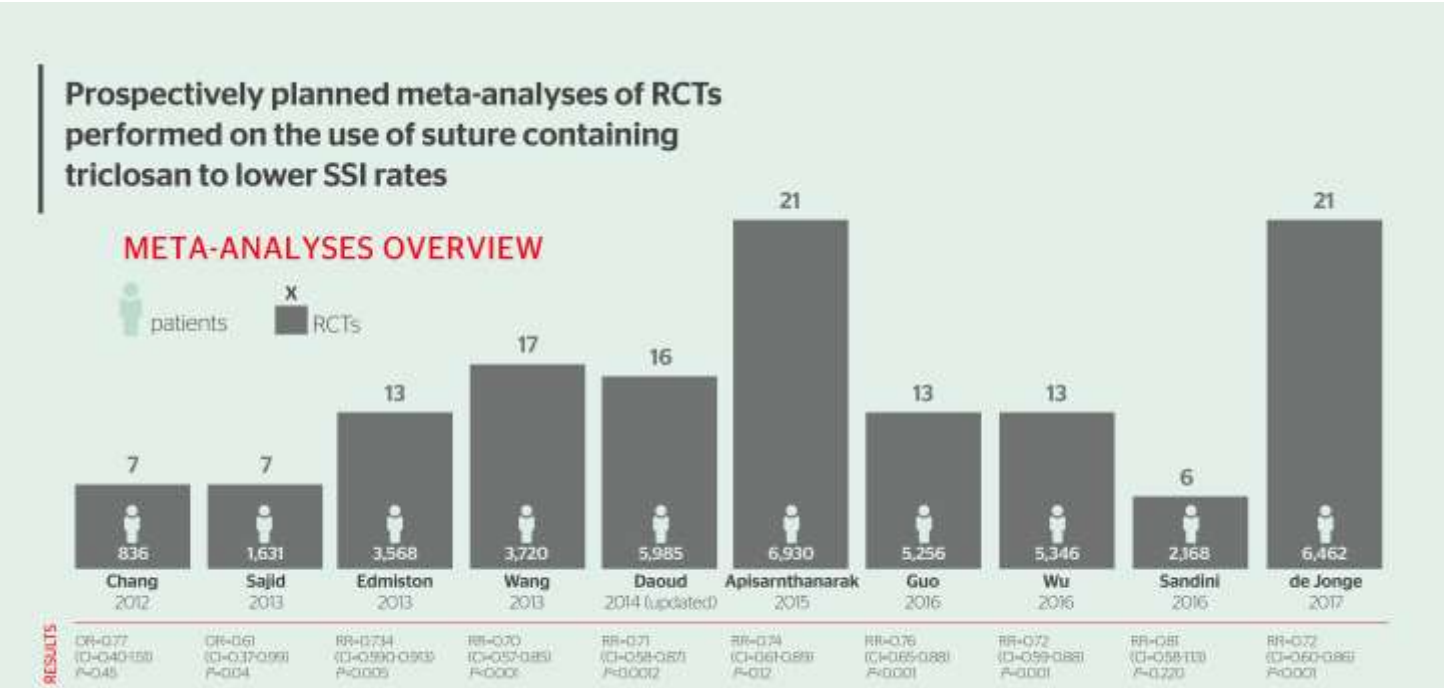
Supported by a wealth of clinical evidence

10 meta-analyses of 24 RCTs involving over 7,000 patients[10-20]



10. Apisarnthanarak A, Singh N, Bandong AN, et al. Triclosan-Coated Sutures Reduce the Risk of Surgical Site Infections: A Systematic Review and Meta-Analysis. Infection Control & Hospital Epidemiology 2015;36:169179. 11. Chang WK, Srinivasa S, Morton R, et al. Triclosan-Impregnated Sutures to Decrease Surgical Site Infections: Systematic Review and Meta-Analysis of Randomized Trials. Ann Surg 2012; 255:854859. 12. Daoud FC, Edmiston CE Jr, Leaper D. Meta-analysis of prevention of surgical site infections following incision closure with triclosan-coated sutures: Robustness to new evidence. Surg Infect (Larchmt) 2014;15:165181. 13. Daoud FC. Systematic Literature Review Update of the PROUD Trial: Potential Usefulness of a Collaborative Database. Letter to Surg Infect (Larchmt) 2014;15:857858. 14. Edmiston CE, Daoud FC, Leaper D. Is there an evidence-based argument for embracing an antimicrobial (triclosan)-coated suture technology to reduce the risk for surgical-site infections?: A meta-analysis. Surgery 2013;154:89100. 15. Guo J, Pan LH, Li YX, et al. E¨icacy of triclosan-coated sutures for reducing risk of surgical site infection in adults: a meta-analysis of randomized clinical trials. J Surg Res 2016; 201:105117. 16. Sajid MS, Craciunas L, Sains P, et al. Use of antibacterial sutures for skin closure in controlling surgical site infections: a systematic review of published randomized, controlled trials. Gastroenterol Rep 2013;1:4250. 17. Sandini M, Mattavelli I, Nespoli L, Uggeri F, Gianotti L. Systematic review and meta-analysis of sutures coated with triclosan for the prevention of surgical site infection after elective colorectal surgery according to the PRISMA statement. Medicine. 2016;95:35(e4057). 18. Wang ZX, Jiang CP, Cao Y, et al. Systematic review and meta-analysis of triclosan-coated sutures for the prevention of surgical-site infection. Brit J Surg 2013;100:465473. 19. Wu X, Kubilay NZ, Ren J, et al. Antimicrobial-coated sutures to decrease surgical site infections: a systematic review and meta-analysis. Eur J Clin Microbiol Infect Dis. 2016. DOI: 10.1007/s10096_016_2765-y. 20. de Jonge SW, Atema JJ, Solomkin JS, Boermeester MA. Meta-analysis and trial sequential analysis of triclosan-coated sutures for the prevention of surgical site infection. Brit J Surg. 2017;ePub-DOI: 10.1002/bjs.10445. 21. Ford HR, Jones P, Gaines B, Reblock K, Simpkins DL. Intraoperative Handling and Wound Healing: Controlled Clinical Trial Comparing Coated VICRYL® Plus Antibacterial Suture (Coated Polyglactin 910 Suture with Triclosan) with Coated VICRYL® Suture (Coated Polyglactin 910 Suture). Surg Infect (Larchmt). 2005;6(3):313¨321.

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2017 de Jonge Meta-analysis

Results

Meta-analysis demonstrates **28% reduction in SSI risk** with the use of triclosan-coated sutures[1]

- 21 RCTs, 6462 patients, 95% CI: (14, 40%), $P < 0.001$
- All triclosan-coated sutures in these RCTs were Ethicon Plus Antibacterial Sutures (Monocryl Plus, Vicryl Plus and PDS Plus)


Meta-analysis and trial sequential analysis of triclosan-coated sutures for the prevention of surgical-site infection

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1 de Jonge SW, Atema JJ, Solomkin JS, Boermeester MA. Meta-analysis and trial sequential analysis of triclosan-coated sutures for the prevention of surgical site infection. Brit J Surg. 2017;ePub-DOI: 10.1002/bjs.10445

2017 de Jonge Meta-analysis

Results

Meta-regression analyses demonstrated that the effect of triclosan-coated sutures in reducing the risk of SSI **does not vary by CDC wound classification* or suture type#**[1]


Meta-analysis and trial sequential analysis of triclosan-coated sutures for the prevention of surgical-site infection

*Clean wounds 10 RCT, 2842 patients 95% CI (11-43%). P= 0.003; non-clean wounds 14 RCT, 3620 patients. 95% CI (7 – 42%). # 21 RCTs, 6462 patients, 95% CI: (14, 40%), *P* < 0.001. All triclosan-coated sutures in these RCTs were Ethicon Plus Antibacterial Sutures (Monocryl Plus, Vicryl Plus and PDS Plus) 1 de Jonge SW, Atema JJ, Solomkin JS, Boermeester MA. Meta-analysis and trial sequential analysis of triclosan-coated sutures for the prevention of surgical site infection. Brit J Surg. 2017;ePub-DOI: 10.1002/bjs.10445

Thank you