Quarterly Review of the Surgical Infection Literature

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The use and knowledge of the literature is important for awareness of current findings, and implementation of advances in surgical infection.  To assist members of the Surgical Infection Society in this endeavour, the Scientific Studies Committee has embarqued upon a program to identify the most important papers in the field of surgical infection, which we hope will be reported every quarter.  These articles are selected by members of the Committee and submitted to the Executive Council for approval prior to appearance on the website of the organization.  Each article will have a few sentences of commentary, and the reader is encouraged to consider and perhaps further explore the article at his/her convenience.  It is hoped that this will further the knowledge of the membership, and provoke further conversation and investigation.

The process used was as follows.  PubMed was used to search all publications between 1 October 2015 and 31 December 2015 with the search terms 'surgery' and 'infection'.  The search was repeated with the terms 'surgery' and 'sepsis'.  Of these, 15 were selected as potentially the most useful for the membership, and are included below.

1. [Eur J Cardiothorac Surg.](http://www.ncbi.nlm.nih.gov/pubmed/26254467) 2015 Nov;48(5):642-53. doi: 10.1093/ejcts/ezv272. Epub 2015 Aug 7.

**EACTS expert consensus statement for surgical management of pleural empyema.**

[Scarci M](http://www.ncbi.nlm.nih.gov/pubmed/?term=Scarci%20M%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)1, [Abah U](http://www.ncbi.nlm.nih.gov/pubmed/?term=Abah%20U%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)2, [Solli P](http://www.ncbi.nlm.nih.gov/pubmed/?term=Solli%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)2, [Page A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Page%20A%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)2, [Waller D](http://www.ncbi.nlm.nih.gov/pubmed/?term=Waller%20D%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)3, [van Schil P](http://www.ncbi.nlm.nih.gov/pubmed/?term=van%20Schil%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)4, [Melfi F](http://www.ncbi.nlm.nih.gov/pubmed/?term=Melfi%20F%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)5, [Schmid RA](http://www.ncbi.nlm.nih.gov/pubmed/?term=Schmid%20RA%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)6, [Athanassiadi K](http://www.ncbi.nlm.nih.gov/pubmed/?term=Athanassiadi%20K%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)7, [Sousa Uva M](http://www.ncbi.nlm.nih.gov/pubmed/?term=Sousa%20Uva%20M%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)8, [Cardillo G](http://www.ncbi.nlm.nih.gov/pubmed/?term=Cardillo%20G%5BAuthor%5D&cauthor=true&cauthor_uid=26254467)9.

PMID: 26254467

**Abstract**

Pleural infection is a frequent clinical condition. Prompt treatment has been shown to reduce hospital costs, morbidity and mortality. Recent advances in treatment have been variably implemented in clinical practice. This statement reviews the latest developments and concepts to improve clinical management and stimulate further research. The European Association for Cardio-Thoracic Surgery (EACTS) Thoracic Domain and the EACTS Pleural Diseases Working Group established a team of thoracic surgeons to produce a comprehensive review of available scientific evidence with the aim to cover all aspects of surgical practice related to its treatment, in particular focusing on: surgical treatment of empyema in adults; surgical treatment of empyema in children; and surgical treatment of post-pneumonectomy empyema (PPE). In the management of Stage 1 empyema, prompt pleural space chest tube drainage is required. In patients with Stage 2 or 3 empyema who are fit enough to undergo an operative procedure, there is a demonstrated benefit of surgical debridement or decortication [possibly by video-assisted thoracoscopic surgery (VATS)] over tube thoracostomy alone in terms of treatment success and reduction in hospital stay. In children, a primary operative approach is an effective management strategy, associated with a lower mortality rate and a reduction of tube thoracostomy duration, length of antibiotic therapy, reintervention rate and hospital stay. Intrapleural fibrinolytic therapy is a reasonable alternative to primary operative management. Uncomplicated PPE [without bronchopleural fistula (BPF)] can be effectively managed with minimally invasive techniques, including fenestration, pleural space irrigation and VATS debridement. PPE associated with BPF can be effectively managed with individualized open surgical techniques, including direct repair, myoplastic and thoracoplastic techniques. Intrathoracic vacuum-assisted closure may be considered as an adjunct to the standard treatment. The current literature cements the role of VATS in the management of pleural empyema, even if the choice of surgical approach relies on the individual surgeon's preference.

This is an interesting paper that recommends a more aggressive approach to empyema with operative techniques, including video-assisted thoracoscopic surgery for cases beyond Stage I. This might change practice for many, and should be considered by the membership.

1. [Eur Heart J.](http://www.ncbi.nlm.nih.gov/pubmed/?term=2015+esc+guidelines+for+the+management+of+infective) 2015 Nov 21;36(44):3075-128. doi: 10.1093/eurheartj/ehv319. Epub 2015 Aug 29.

**2015 ESC Guidelines for the management of infective endocarditis: The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC)Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM).**

[Authors/Task Force Members](http://www.ncbi.nlm.nih.gov/pubmed/?term=Authors%2FTask%20Force%20Members%5BCorporate%20Author%5D), [Habib G](http://www.ncbi.nlm.nih.gov/pubmed/?term=Habib%20G%5BAuthor%5D&cauthor=true&cauthor_uid=26320109)1, [Lancellotti P](http://www.ncbi.nlm.nih.gov/pubmed/?term=Lancellotti%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26320109)1, [Antunes MJ](http://www.ncbi.nlm.nih.gov/pubmed/?term=Antunes%20MJ%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Bongiorni MG](http://www.ncbi.nlm.nih.gov/pubmed/?term=Bongiorni%20MG%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Casalta JP](http://www.ncbi.nlm.nih.gov/pubmed/?term=Casalta%20JP%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Del Zotti F](http://www.ncbi.nlm.nih.gov/pubmed/?term=Del%20Zotti%20F%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Dulgheru R](http://www.ncbi.nlm.nih.gov/pubmed/?term=Dulgheru%20R%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [El Khoury G](http://www.ncbi.nlm.nih.gov/pubmed/?term=El%20Khoury%20G%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Erba PA](http://www.ncbi.nlm.nih.gov/pubmed/?term=Erba%20PA%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Iung B](http://www.ncbi.nlm.nih.gov/pubmed/?term=Iung%20B%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Miro JM](http://www.ncbi.nlm.nih.gov/pubmed/?term=Miro%20JM%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Mulder BJ](http://www.ncbi.nlm.nih.gov/pubmed/?term=Mulder%20BJ%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Plonska-Gosciniak E](http://www.ncbi.nlm.nih.gov/pubmed/?term=Plonska-Gosciniak%20E%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Price S](http://www.ncbi.nlm.nih.gov/pubmed/?term=Price%20S%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Roos-Hesselink J](http://www.ncbi.nlm.nih.gov/pubmed/?term=Roos-Hesselink%20J%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Snygg-Martin U](http://www.ncbi.nlm.nih.gov/pubmed/?term=Snygg-Martin%20U%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Thuny F](http://www.ncbi.nlm.nih.gov/pubmed/?term=Thuny%20F%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Tornos Mas P](http://www.ncbi.nlm.nih.gov/pubmed/?term=Tornos%20Mas%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Vilacosta I](http://www.ncbi.nlm.nih.gov/pubmed/?term=Vilacosta%20I%5BAuthor%5D&cauthor=true&cauthor_uid=26320109), [Zamorano JL](http://www.ncbi.nlm.nih.gov/pubmed/?term=Zamorano%20JL%5BAuthor%5D&cauthor=true&cauthor_uid=26320109); 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This is a useful set of guidelines for the management of endocarditis. It is comprehensive in its recommendations with levels of evidence specified. This will be useful as a reference whenever this issue is encountered (no abstract and the text is not summarized enough for publication here).

1. World J Emerg Surg. 2015; 10: 38.

Published online 2015 Aug 20. doi:  [10.1186/s13017-015-0033-6](http://dx.doi.org/10.1186%2Fs13017-015-0033-6" \t "pmc_ext)

PMCID: PMC4545872

**WSES guidelines for management of *Clostridium difficile* infection in surgical patients**

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**Abstract**

In the last two decades there have been dramatic changes in the epidemiology of *Clostridium difficile* infection (CDI), with increases in incidence and severity of disease in many countries worldwide. The incidence of CDI has also increased in surgical patients. Optimization of management of *C difficile*, has therefore become increasingly urgent. An international multidisciplinary panel of experts prepared evidenced-based World Society of Emergency Surgery (WSES) guidelines for management of CDI in surgical patients.

**Recommendations**

**Diagnosis**

1) Stool testing should only be performed on diarrhea stools from at-risk patients with clinically significant diarrhea (Recommendation 1 C).

2) For patients with ileus who may be unable to produce stool specimens, polymerase chain reaction testing of perirectal swabs may be an accurate and efficient method to detect toxigenic *C. difficile* in patients with symptoms of CDI (Recommendation 2B).

3) Nucleic acid amplification tests (NAAT) such as polymerase chain reaction (PCR) for *C. difficile* toxin genes appear to be sensitive and specific and may be used as a standard diagnostic test for CDI. NAAT as single-step algorithm can increase detection of asymptomatic colonization therefore it should only be performed in patients with clinical suspicion for CDI (Recommendation 1 B).

4) Glutamate dehydrogenase (GDH) screening tests for *C. difficile* are sensitive but do not differentiate between toxigenic and non-toxigenic strains. They may be used in association with toxin A and B EIA testing. Algorithms involving screening with an EIA for GDH followed by a toxin assay may be used (Recommendation 1 B).

5) Enzyme immunoassay (EIA) for toxin A/B is fast and inexpensive and has high specificity but it is not recommended alone due to its relatively low sensitivity. (Recommendation 1 B).

6) *Clostridium difficile* culture is relatively slow but sensitive. It is rarely performed today as a routine diagnostic test. *C. difficile* culture is recommended for subsequent epidemiological typing and characterization of strains (Recommendation 1 C).

7) Repeat testing within 7 days should not be performed on patients who previously tested negative unless the clinical picture has changed significantly (Recommendation 1 C).

8) Immunocompromised patients (including patients in chemotherapy, chronic corticosteroid therapy or immunosuppressive agents, and post-transplant patients) should be always tested for CDI if they have a diarrheal illness (Recommendation 1 C).

9) CT imaging is suggested for suspected severe-complicated *C. difficile* colitis, however its sensitivity is not satisfactory for screening purposes (Recommendation 2 B).

10) Ultrasound may be useful in critically ill patients suspected to have pseudomembranous colitis who cannot be transported for CT scan (Recommendation 2 C).

11) Flexible sigmoidoscopy may be helpful for the diagnosis of *C. difficile* colitis (CDC) when there is a high level of clinical suspicion for *C. difficile* despite repeated negative laboratory assays (Recommendation 2 B).

***Antimicrobial therapy***

12) Unnecessary antimicrobial agent(s) and proton pump inhibitors should be discontinued if CDI is suspected (Recommendation 1 C).

13) Empirical therapy for CDI should be avoided unless there is a strong suspicion for CDI. If a patient has a strong suspicion for CDI, empirical therapy for CDI should be considered while awaiting test results (Recommendation 1 B).

14) Metronidazole is recommended for the treatment of mild-moderate disease (Recommendation 1 A).

15) Oral vancomycin is recommended for treatment of patients with severe disease, or for patients with mild-moderate disease who do not respond to metronidazole. (Recommendation 1 A).

16) In patients in whom oral antibiotics cannot reach the colon, vancomycin may be administered by enema and metronidazole can be given intravenously (Recommendation 1 B).

17) Fidaxomicin may be used to treat CDI, especially in the patients at higher risk for recurrence (e.g. elderly patients with severe underlying disease or those requiring receiving concomitant antibiotics) (Recommendation 1 A).

**Surgical management**

18) Patients with severe CDI who progress to systemic toxicity should undergo early surgical consultation and evaluated for potential surgical intervention (Recommendation 1 C).

19) Resection of the entire colon should be considered to treat patients with fulminant colitis (FC) (Recommendation 1 B).

20) Diverting loop ileostomy with colonic lavage may be a useful alternative to resection of entire colon (Recommendation 2 C).

21) Patients with FC should be treated with high dose oral or by enema vancomycin (500 mg, 6 hourly) in combination with intravenous metronidazole (500 mg, 8 hourly). (Recommendation 1 C).

**Supportive care**

22) Supportive measures, including intravenous fluid resuscitation and electrolyte replacement, should be provided to all patients with severe *C. difficile* infection (Recommendation 1 C).

23) Early detection of shock and aggressive management of underlying organ dysfunction are essential for optimum outcomes in patients with fulminant colitis (Recommendation 1 C).

**Recurrent C. difficile infection (RCDI)**

24) Agents that may be used to treat the first recurrence of CDI include metronidazole, for non-severe RCDI, and vancomycin for severe RCDI. (Recommendation 1 B).

25) Fidaxomicin may be used as an alternative agent (Recommendation 1 B).

26) In subsequent recurrence of CDI (2nd or later) oral vancomycin or fidaxomicin is recommended (Recommendation 1 B).

**Probiotics**

27) Probiotics may be considered as an adjunctive treatment to antibiotics for immunocompetent patients with RCDI (Recommendation 2 B).

**Faecal microbiota transplantation**

28) Intestinal or faecal microbiota transplantation (IMT or FMT) may be an effective option for the treatment of RCDI (Recommendation 1 B).

29) FMT may be effective in immunocompromised patients and patients who have had solid organ transplants (Recommendation 2 B).

**Intravenous immunoglobulin (IVIG)**

30) IVIG should only be used as adjunct therapy in patients with multiple recurrent or fulminant CDI until results from large, randomized controlled trials are available (Recurrence 2 C).

**Monoclonal antibodies**

31) Infusion with monoclonal antibodies may be of use to prevent recurrences of CDI, particularly in patients with CDI due to the 027 epidemic strain (Recommendation 2 C).

**Enteral nutrition in CDI**

32) Tube feeding patients should be clinically assessed due to their risk for developing CDI (Recommendation 2 C).

**Anti-motility agents**

33) The use of anti-peristaltic agents for the treatment of CDI should be discouraged. If anti-peristaltic, if used in isolation agents, are used to control persistent symptoms in patients with CDI they must always be accompanied by medical therapy (Recommendation 2 C).

**Prevention**

34) Proper antimicrobial stewardship in selecting an appropriate antibiotic and optimizing its dose and duration to cure an infection may prevent the emergence of *C. difficile* (Recommendation 1 B).

35) Patients with suspected or proven CDI should be placed in contact (enteric) precautions (Recommendation 1 B).

36) Hand hygiene with soap and water is a cornerstone of the prevention of *C. difficile*. Hand hygiene, contact precautions and good cleaning and disinfection of the environment and patient care equipment, should be used by all health-care workers contacting any patient with known or suspected CDI (Recommendation 1 B).

These are solid recommendations with support in the literature. This provides a useful list of effective approaches that should be instituted in the SICU.

[See comment in PubMed Commons below](http://www.ncbi.nlm.nih.gov/pubmed/25480617#comments)

1. [Surg Endosc.](http://www.ncbi.nlm.nih.gov/pubmed/25480617) 2015 Sep;29(9):2720-7. doi: 10.1007/s00464-014-3994-8. Epub 2014 Dec 6.

**Short and long-term outcomes of a randomised controlled trial of vertical periumbilical wound versus transverse left iliac fossa wound for specimen retrieval in laparoscopic anterior resections.**

[Tan WS](http://www.ncbi.nlm.nih.gov/pubmed/?term=Tan%20WS%5BAuthor%5D&cauthor=true&cauthor_uid=25480617)1, [Chew MH](http://www.ncbi.nlm.nih.gov/pubmed/?term=Chew%20MH%5BAuthor%5D&cauthor=true&cauthor_uid=25480617), [Ho KS](http://www.ncbi.nlm.nih.gov/pubmed/?term=Ho%20KS%5BAuthor%5D&cauthor=true&cauthor_uid=25480617), [Yatim JB](http://www.ncbi.nlm.nih.gov/pubmed/?term=Yatim%20JB%5BAuthor%5D&cauthor=true&cauthor_uid=25480617), [Lai JS](http://www.ncbi.nlm.nih.gov/pubmed/?term=Lai%20JS%5BAuthor%5D&cauthor=true&cauthor_uid=25480617), [Tang CL](http://www.ncbi.nlm.nih.gov/pubmed/?term=Tang%20CL%5BAuthor%5D&cauthor=true&cauthor_uid=25480617).

**Abstract**

**BACKGROUND:**

The ideal incision for laparoscopic specimen extraction is not known. There has been no randomised study thus far evaluating extraction site in laparoscopic colorectal surgery. The aim of our study was to compare post-operative outcomes, pain scores and quality of life scores of vertical periumbilical (VW) versus transverse left iliac fossa (TW) incisions for specimen extraction in laparoscopic anterior resections.

**METHODS:**

Using an assumption of pain score of 5 in the VW group versus pain score of 2 in the TW group, on day one post-operatively, and based on a 80% statistical power of analysis to achieve a statistical difference with reduction in pain scores, the sample size per arm calculated was 16. Forty patients undergoing laparoscopic anterior resection were randomised to VW (n = 20) or TW (n = 20). Primary endpoint was post-operative pain. Secondary endpoints were post-operative outcomes, wound cosmesis using Hollander Cosmesis Score and quality of life assessment using EQ-5D at 2 weeks and 2 months post-operatively.

**RESULTS:**

Median pain score on the first post-operative day was 2 in both groups (p = 0.360). There was no significant difference in wound infection rates, operative time or post-operative recovery. Cosmesis scores and EQ-5D scores were also similar in both groups. At a median follow-up of 30 months, the incidence of extraction site incisional hernia was similar.

**CONCLUSION:**

Transverse and vertical incisions in laparoscopic colorectal surgery have similar post-operative outcomes, with similar pain scores, cosmesis scores, quality of life scores and incisional hernia rates.

This study suggests that periumbilical or transverse iliac fossa incisions for specimen removal after laparoscopic procedures are not different in terms of pain, operative outcomes, or cosmetic outcomes. Choice then should be individualized and left to the surgeon and patient.

1. [Br J Anaesth.](http://www.ncbi.nlm.nih.gov/pubmed/25900659) 2015 Sep;115(3):434-43. doi: 10.1093/bja/aev062. Epub 2015 Apr 20.

**Effects of supplemental oxygen and dexamethasone on surgical site infection: a factorial randomized trial‡.**

[Kurz A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Kurz%20A%5BAuthor%5D&cauthor=true&cauthor_uid=25900659)1, [Fleischmann E](http://www.ncbi.nlm.nih.gov/pubmed/?term=Fleischmann%20E%5BAuthor%5D&cauthor=true&cauthor_uid=25900659)2, [Sessler DI](http://www.ncbi.nlm.nih.gov/pubmed/?term=Sessler%20DI%5BAuthor%5D&cauthor=true&cauthor_uid=25900659)3, [Buggy DJ](http://www.ncbi.nlm.nih.gov/pubmed/?term=Buggy%20DJ%5BAuthor%5D&cauthor=true&cauthor_uid=25900659)4, [Apfel C](http://www.ncbi.nlm.nih.gov/pubmed/?term=Apfel%20C%5BAuthor%5D&cauthor=true&cauthor_uid=25900659)5, [Akça O](http://www.ncbi.nlm.nih.gov/pubmed/?term=Ak%C3%A7a%20O%5BAuthor%5D&cauthor=true&cauthor_uid=25900659)6; [Factorial Trial Investigators](http://www.ncbi.nlm.nih.gov/pubmed/?term=Factorial%20Trial%20Investigators%5BCorporate%20Author%5D).

**Abstract**

**BACKGROUND:**

Tissue oxygenation is a strong predictor of surgical site infection. Improving tissue oxygenation should thus reduce wound infection risk. Supplemental inspired oxygen can improve tissue oxygenation, but whether it reduces infection risk remains controversial. Low-dose dexamethasone is often given to reduce the risk of postoperative nausea and vomiting, but steroid-induced immunosuppression can increase infection risk. We therefore tested the hypotheses that supplemental perioperative oxygen reduces infection risk and that dexamethasone increases it.

**METHODS:**

Using a factorial design, patients having colorectal resections expected to last ≥2 h were randomly assigned to 30% (n=270) or 80% (n=285) inspired oxygen during and for 1 h after surgery, and to 4 mg intraoperative dexamethasone (n=283) or placebo (n=272). Physicians blinded to group assignments evaluated wounds postoperatively, using US Centers for Disease Control criteria.

**RESULTS:**

Subject and surgical characteristics were similar among study groups. Surgical site infection incidence was similar among groups: 30% oxygen 15.6%, 80% oxygen 15.8% (P=1.00); dexamethasone 15.9%, placebo 15.4%, (P=0.91).

**CONCLUSIONS:**

Supplemental oxygen did not reduce surgical site infection risk. The preponderance of clinical evidence suggests that administration of 80% supplemental inspired oxygen does not reduce infection risk. We did not observe an increased risk of surgical site infection with the use of a single low dose of dexamethasone, indicating that it can be used for nausea and vomiting prophylaxis without promoting wound infections.

This is a useful study demonstrating that effects of increased inspired oxygen during colectomy or low-dose dexamethasone are not what might be assumed; these investigators found no effect of either treatment on surgical site infection. Therefore, as with incisions for specimen removal after laparoscopic surgery, strategies in this regard can be individualized to the patient.

[See comment in PubMed Commons below](http://www.ncbi.nlm.nih.gov/pubmed/26270686#comments)

1. [Clin Infect Dis.](http://www.ncbi.nlm.nih.gov/pubmed/26270686) 2015 Dec 1;61(11):1671-8. doi: 10.1093/cid/civ707. Epub 2015 Aug 13.

**A Randomized, Placebo-controlled Trial of Preemptive Antifungal Therapy for the Prevention of Invasive Candidiasis Following Gastrointestinal Surgery for Intra-abdominal Infections.**

[Knitsch W](http://www.ncbi.nlm.nih.gov/pubmed/?term=Knitsch%20W%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)1, [Vincent JL](http://www.ncbi.nlm.nih.gov/pubmed/?term=Vincent%20JL%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)2, [Utzolino S](http://www.ncbi.nlm.nih.gov/pubmed/?term=Utzolino%20S%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)3, [François B](http://www.ncbi.nlm.nih.gov/pubmed/?term=Fran%C3%A7ois%20B%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)4, [Dinya T](http://www.ncbi.nlm.nih.gov/pubmed/?term=Dinya%20T%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)5, [Dimopoulos G](http://www.ncbi.nlm.nih.gov/pubmed/?term=Dimopoulos%20G%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)6, [Özgüneş İ](http://www.ncbi.nlm.nih.gov/pubmed/?term=%C3%96zg%C3%BCne%C5%9F%20%C4%B0%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)7, [Valía JC](http://www.ncbi.nlm.nih.gov/pubmed/?term=Val%C3%ADa%20JC%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)8, [Eggimann P](http://www.ncbi.nlm.nih.gov/pubmed/?term=Eggimann%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)9, [León C](http://www.ncbi.nlm.nih.gov/pubmed/?term=Le%C3%B3n%20C%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)10, [Montravers P](http://www.ncbi.nlm.nih.gov/pubmed/?term=Montravers%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)11, [Phillips S](http://www.ncbi.nlm.nih.gov/pubmed/?term=Phillips%20S%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)12, [Tweddle L](http://www.ncbi.nlm.nih.gov/pubmed/?term=Tweddle%20L%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)13, [Karas A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Karas%20A%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)13, [Brown M](http://www.ncbi.nlm.nih.gov/pubmed/?term=Brown%20M%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)14, [Cornely OA](http://www.ncbi.nlm.nih.gov/pubmed/?term=Cornely%20OA%5BAuthor%5D&cauthor=true&cauthor_uid=26270686)15.

**Abstract**

**BACKGROUND:**

Patients undergoing emergency gastrointestinal surgery for intra-abdominal infection are at risk of invasive candidiasis (IC) and candidates for preemptive antifungal therapy.

**METHODS:**

This exploratory, randomized, double-blind, placebo-controlled trial assessed a preemptive antifungal approach with micafungin (100 mg/d) in intensive care unit patients undergoing surgery for intra-abdominal infection. Co-primary efficacy variables were the incidence of IC and the time from baseline to first IC in the full analysis set; an independent data review board confirmed IC. An exploratory biomarker analysis was performed using logistic regression.

**RESULTS:**

The full analysis set comprised 124 placebo- and 117 micafungin-treated patients. The incidence of IC was 8.9% for placebo and 11.1% for micafungin (difference, 2.24%; [95% confidence interval, -5.52 to 10.20]). There was no difference between the arms in median time to IC. The estimated odds ratio showed that patients with a positive (1,3)-β-d-glucan (ßDG) result were 3.66 (95% confidence interval, 1.01-13.29) times more likely to have confirmed IC than those with a negative result.

**CONCLUSIONS:**

This study was unable to provide evidence that preemptive administration of an echinocandin was effective in preventing IC in high-risk surgical intensive care unit patients with intra-abdominal infections. This may have been because the drug was administered too late to prevent IC coupled with an overall low number of IC events. It does provide some support for using ßDG to identify patients at high risk of IC.

Another negative study,… Benefit of a prophylactic echinocandin for the prevention of invasive candidiasis was not demonstrated in this study for those with emergency intra-abdominal procedures. One finding of note was some potential utility for beta-glucan in the detection of invasive candidiasis.



[See comment in PubMed Commons below](http://www.ncbi.nlm.nih.gov/pubmed/25243561#comments)

1. [Ann Surg.](http://www.ncbi.nlm.nih.gov/pubmed/25243561) 2015 Aug;262(2):397-402. doi: 10.1097/SLA.0000000000000938.

**Antibiotic Prophylaxis to Prevent Surgical Site Infections in Children: A Prospective Cohort Study.**

[Khoshbin A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Khoshbin%20A%5BAuthor%5D&cauthor=true&cauthor_uid=25243561)1, [So JP](http://www.ncbi.nlm.nih.gov/pubmed/?term=So%20JP%5BAuthor%5D&cauthor=true&cauthor_uid=25243561), [Aleem IS](http://www.ncbi.nlm.nih.gov/pubmed/?term=Aleem%20IS%5BAuthor%5D&cauthor=true&cauthor_uid=25243561), [Stephens D](http://www.ncbi.nlm.nih.gov/pubmed/?term=Stephens%20D%5BAuthor%5D&cauthor=true&cauthor_uid=25243561), [Matlow AG](http://www.ncbi.nlm.nih.gov/pubmed/?term=Matlow%20AG%5BAuthor%5D&cauthor=true&cauthor_uid=25243561), [Wright JG](http://www.ncbi.nlm.nih.gov/pubmed/?term=Wright%20JG%5BAuthor%5D&cauthor=true&cauthor_uid=25243561); [SickKids Surgical Site Infection Task Force](http://www.ncbi.nlm.nih.gov/pubmed/?term=SickKids%20Surgical%20Site%20Infection%20Task%20Force%5BCorporate%20Author%5D).

**Abstract**

**OBJECTIVE:**

To investigate the association between antibiotic prophylaxis (AP) and surgical-site infection in pediatric patients.

**BACKGROUND:**

Surgical-site infections (SSIs) are a major cause of postoperative morbidity and mortality. Despite numerous studies in adults, benefit of AP in preventing SSIs in children is uncertain.

**METHODS:**

Patients aged 0 to 21 years who underwent surgical procedures at a pediatric acute care hospital from April 1, 2009, to December 31, 2010, were assessed. Antibiotic prophylaxis indication and administration according to an evidence-based guideline were recorded. Complete compliance was defined as AP given, when indicated, within 60 minutes before incision. Surgical-site infections were identified using the Centers for Disease Control and Prevention criteria and documented in the medical records using the International Classification of Diseases, Tenth Revision. Multiple logistic regressions adjusting for age, gender, American Society of Anesthesiologists status, wound classification, admission status, surgical discipline, and surgical duration evaluated association of AP compliance and SSI.

**RESULTS:**

Of 5309 patients for whom antibiotics were indicated, 3901 (73.5%) with complete compliance had an infection rate of 3.0%, whereas 1408 (26.5%) who were not compliant had an infection rate of 4.3% (adjusted relative risk: 0.7; 95% confidence interval: 0.5-0.9; P = 0.02). Of 4156 patients for whom antibiotics were not indicated, the 895 (21.5%) who received antibiotics had an infection rate of 1.7% compared with 0.7% in the 3261 (78.5%) who did not receive antibiotics (adjusted relative risk: 1.6; 95% confidence interval: 0.8-3.1; P = 0.18).

**CONCLUSIONS:**

In pediatric surgery, complete compliance with AP was associated with 30% decreased risk of SSI.

The study confirms that compliance with prophylactic antibiotic according to published guidelines decreases risk of surgical-site infections in children. Further, antibiotic use in those without indications had no effect at best, and at worst actually increased infections (not statistically significant). This further confirms current guidelines for the use of peri-operative prophylactic antibiotics.

1. [Am J Obstet Gynecol.](http://www.ncbi.nlm.nih.gov/pubmed/25882919) 2015 Aug;213(2):194.e1-8. doi: 10.1016/j.ajog.2015.04.003. Epub 2015 Apr 13.

**Cranberry juice capsules and urinary tract infection after surgery: results of a randomized trial.**

[Foxman B](http://www.ncbi.nlm.nih.gov/pubmed/?term=Foxman%20B%5BAuthor%5D&cauthor=true&cauthor_uid=25882919)1, [Cronenwett AE](http://www.ncbi.nlm.nih.gov/pubmed/?term=Cronenwett%20AE%5BAuthor%5D&cauthor=true&cauthor_uid=25882919)2, [Spino C](http://www.ncbi.nlm.nih.gov/pubmed/?term=Spino%20C%5BAuthor%5D&cauthor=true&cauthor_uid=25882919)3, [Berger MB](http://www.ncbi.nlm.nih.gov/pubmed/?term=Berger%20MB%5BAuthor%5D&cauthor=true&cauthor_uid=25882919)4, [Morgan DM](http://www.ncbi.nlm.nih.gov/pubmed/?term=Morgan%20DM%5BAuthor%5D&cauthor=true&cauthor_uid=25882919)4.

**Abstract**

**OBJECTIVE:**

The risk of urinary tract infection (UTI) among women undergoing elective gynecological surgery during which a catheter is placed is high: 10-64% following catheter removal. We conducted the first randomized, double-blind, placebo-controlled trial of the therapeutic efficacy of cranberry juice capsules in preventing UTI after surgery.

**STUDY DESIGN:**

We recruited subjects from a single hospital between August 2011 and January 2013. Eligible participants were undergoing elective gynecological surgery that did not involve a fistula repair or vaginal mesh removal. One hundred sixty were randomized and received 2 cranberry juice capsules 2 times a day, equivalent to 2 8 ounce servings of cranberry juice, for 6 weeks after surgery or matching placebo. The primary endpoint was the proportion of participants who experienced clinically diagnosed and treated UTI with or without positive urine culture. Kaplan-Meier plots and log rank tests compared the 2 treatment groups.

**RESULTS:**

The occurrence of UTI was significantly lower in the cranberry treatment group compared with the placebo group (15 of 80 [19%] vs 30 of 80 [38%]; odds ratio, 0.38; 95% confidence interval, 0.19-0.79; p = .008). After adjustment for known confounders, including the frequency of intermittent self-catheterization in the postoperative period, the protective effects of cranberry remained (odds ratio, 0.42; 95% confidence interval, 0.18-0.94). There were no treatment differences in the incidence of adverse events, including gastrointestinal upset (56% vs 61% for cranberry vs placebo).

**CONCLUSION:**

Among women undergoing elective benign gynecological surgery involving urinary catheterization, the use of cranberry extract capsules during the postoperative period reduced the rate of UTI by half.

This appears to be a firm finding, in that cranberry capsules for 6 weeks after elective gynecologic surgery with bladder catheterization decreased urinary tract infection, so might be considered for the standard of care since it is inexpensive with little opportunity cost to the surgeon or patient. Further, 1) perhaps this could be considered for other types of surgery, and 2) is the effect confined to women?



[See comment in PubMed Commons below](http://www.ncbi.nlm.nih.gov/pubmed/26258310#comments)

1. [Ann Surg.](http://www.ncbi.nlm.nih.gov/pubmed/26258310) 2015 Sep;262(3):416-25; discussion 423-5. doi: 10.1097/SLA.0000000000001416.

**Combined preoperative mechanical bowel preparation with oral antibiotics significantly reduces surgical site infection, anastomotic leak, and ileus after colorectal surgery.**

[Kiran RP](http://www.ncbi.nlm.nih.gov/pubmed/?term=Kiran%20RP%5BAuthor%5D&cauthor=true&cauthor_uid=26258310)1, [Murray AC](http://www.ncbi.nlm.nih.gov/pubmed/?term=Murray%20AC%5BAuthor%5D&cauthor=true&cauthor_uid=26258310), [Chiuzan C](http://www.ncbi.nlm.nih.gov/pubmed/?term=Chiuzan%20C%5BAuthor%5D&cauthor=true&cauthor_uid=26258310), [Estrada D](http://www.ncbi.nlm.nih.gov/pubmed/?term=Estrada%20D%5BAuthor%5D&cauthor=true&cauthor_uid=26258310), [Forde K](http://www.ncbi.nlm.nih.gov/pubmed/?term=Forde%20K%5BAuthor%5D&cauthor=true&cauthor_uid=26258310).

**Abstract**

**OBJECTIVES:**

To clarify whether bowel preparation use or its individual components [mechanical bowel preparation (MBP)/oral antibiotics] impact specific outcomes after colorectal surgery.

**METHODS:**

National Surgical Quality Improvement Program-targeted colectomy data initiated in 2012 capture information on the use/type of bowel preparation and colorectal-specific complications. For patients undergoing elective colorectal resection, the impact of preoperative MBP and antibiotics (MBP+/ABX+), MBP alone (MBP+/ABX-), and no bowel preparation (no-prep) on outcomes, particularly anastomotic leak, surgical site infection (SSI), and ileus, were evaluated using unadjusted/adjusted logistic regression analysis.

**RESULTS:**

Of 8442 patients, 2296 (27.2%) had no-prep, 3822 (45.3%) MBP+/ABX-, and 2324 (27.5%) MBP+/ABX+. Baseline characteristics were similar; however, there were marginally more patients with prior sepsis, ascites, steroid use, bleeding disorders, and disseminated cancer in no-prep. MBP with or without antibiotics was associated with reduced ileus [MBP+/ABX+: odds ratio (OR) = 0.57, 95% confidence interval (CI): 0.48-0.68; MBP+/ABX-: OR = 0.78, 95% CI: 0.68-0.91] and SSI [MBP+/ABX+: OR = 0.39, 95% CI: 0.32-0.48; MBP+/ABX-: OR = 0.80, 95% CI: 0.69-0.93] versus no-prep. MBP+/ABX+ was also associated with lower anastomotic leak rate than no-prep [OR = 0.45 (95% CI: 0.32-0.64)]. On multivariable analysis, MBP with antibiotics, but not without, was independently associated with reduced anastomotic leak (OR = 0.57, 95% CI: 0.35-0.94), SSI (OR = 0.40, 95% CI: 0.31-0.53), and postoperative ileus (OR = 0.71, 95% CI: 0.56-0.90).

**CONCLUSIONS:**

These data clarify the near 50-year debate whether bowel preparation improves outcomes after colorectal resection. MBP with oral antibiotics reduces by nearly half, SSI, anastomotic leak, and ileus, the most common and troublesome complications after colorectal surgery.

This paper certainly adds fuel to the fire, and the results are hard to ignore. This was a non-randomized sample of patients, but curiously the distribution is fairly even between those with no prep, prep without antibiotics, and prep with antibiotics. In these subjects, prep with antibiotics was the clear winner, though this might have been proportionately affected by the emergency cases that were less likely to have a prep with antibiotics. Perhaps the pendulum should swing back in the other direction with a return to more bowel preps?

[See comment in PubMed Commons below](http://www.ncbi.nlm.nih.gov/pubmed/25690514#comments)

1. [Eur J Orthop Surg Traumatol.](http://www.ncbi.nlm.nih.gov/pubmed/25690514) 2015 Aug;25(6):1031-8. doi: 10.1007/s00590-015-1609-2. Epub 2015 Feb 18.

**Blood transfusion and risk of infection in frail elderly after hip fracture surgery: the TRIFE randomized controlled trial.**

[Gregersen M](http://www.ncbi.nlm.nih.gov/pubmed/?term=Gregersen%20M%5BAuthor%5D&cauthor=true&cauthor_uid=25690514)1, [Damsgaard EM](http://www.ncbi.nlm.nih.gov/pubmed/?term=Damsgaard%20EM%5BAuthor%5D&cauthor=true&cauthor_uid=25690514), [Borris LC](http://www.ncbi.nlm.nih.gov/pubmed/?term=Borris%20LC%5BAuthor%5D&cauthor=true&cauthor_uid=25690514).

**Abstract**

**OBJECTIVES:**

It is still under debate whether red blood cell (RBC) transfusions increase the risk of healthcare-associated infections after hip fracture surgery. Previously, we found that a liberal RBC transfusion strategy improved survival in nursing home residents. Our aim, therefore, was to investigate whether a more liberal RBC transfusion strategy was associated with a higher infection risk in frail elderly hip fracture patients.

**DESIGN:**

Prospective, assessor-blinded, randomized and controlled trial.

**SETTINGS:**

Orthopedic ward, Geriatric ward, and Hospital-at-home.

**PATIENTS:**

284 consecutively hospital-admitted elderly with hip fracture from nursing homes or sheltered housing facilities were included.

**INTERVENTION:**

A restrictive RBC transfusion strategy (hemoglobin <9.7 g/dL; 6 mmol/L) compared with a liberal strategy (hemoglobin <11.3 g/dL; 7 mmol/L) administered within 30 days after surgery.

**MAIN OUTCOME MEASUREMENTS:**

Leukocytes and C-reactive protein (CRP) in repeated blood samples within 30 days, and number of all infections (pneumonia, urinary tract infection, and other infections) within 10 days.

**RESULTS:**

88 % of the patients received a RBC transfusion. A median of 1 RBC unit (interquartile range (IQR): 1-2) was transfused for the restrictive strategy group versus 3 RBC units (IQR: 2-5) for the liberal group. Leukocytes and CRP measurements were similar for both groups. Rates of infection were 72 % for the restrictive group compared to 66 % for the liberal group (risk ratio 1.08; 95 % confidence interval 0.93-1.27, p value 0.29).

**CONCLUSIONS:**

A more liberal RBC transfusion strategy was not associated with higher risk of infection among residents from nursing homes or sheltered housing undergoing hip fracture surgery.

The hits keep coming,… So, this paper shows that giving more blood is not necessarily detrimental in terms of infection risk in hip surgery, however, no particular benefits were detected either. For resource reasons, then, a more restrictive transfusion policy might still be more highly considered.

1. [Ann Surg.](http://www.ncbi.nlm.nih.gov/pubmed/26135691) 2015 Jul 1. [Epub ahead of print]

**Diagnostic Accuracy of Inflammatory Markers As Early Predictors of Infection After Elective Colorectal Surgery: Results From the IMACORS Study.**

[Facy O](http://www.ncbi.nlm.nih.gov/pubmed/?term=Facy%20O%5BAuthor%5D&cauthor=true&cauthor_uid=26135691)1, [Paquette B](http://www.ncbi.nlm.nih.gov/pubmed/?term=Paquette%20B%5BAuthor%5D&cauthor=true&cauthor_uid=26135691), [Orry D](http://www.ncbi.nlm.nih.gov/pubmed/?term=Orry%20D%5BAuthor%5D&cauthor=true&cauthor_uid=26135691), [Binquet C](http://www.ncbi.nlm.nih.gov/pubmed/?term=Binquet%20C%5BAuthor%5D&cauthor=true&cauthor_uid=26135691), [Masson D](http://www.ncbi.nlm.nih.gov/pubmed/?term=Masson%20D%5BAuthor%5D&cauthor=true&cauthor_uid=26135691), [Bouvier A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Bouvier%20A%5BAuthor%5D&cauthor=true&cauthor_uid=26135691), [Fournel I](http://www.ncbi.nlm.nih.gov/pubmed/?term=Fournel%20I%5BAuthor%5D&cauthor=true&cauthor_uid=26135691), [Charles PE](http://www.ncbi.nlm.nih.gov/pubmed/?term=Charles%20PE%5BAuthor%5D&cauthor=true&cauthor_uid=26135691), [Rat P](http://www.ncbi.nlm.nih.gov/pubmed/?term=Rat%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26135691), [Ortega-Deballon P](http://www.ncbi.nlm.nih.gov/pubmed/?term=Ortega-Deballon%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26135691); [IMACORS Study](http://www.ncbi.nlm.nih.gov/pubmed/?term=IMACORS%20Study%5BCorporate%20Author%5D).

**Abstract**

**BACKGROUND:**

Intra-abdominal infections are frequent and life-threatening complications after colorectal surgery. An early detection could diminish their clinical impact and permit safe early discharge.

**OBJECTIVE:**

This study aimed to find the most accurate marker for the detection of postoperative intra-abdominal infection and the appropriate moment to measure it.

**METHODS:**

A prospective, observational study was conducted in 3 centers. Consecutive patients undergoing elective colorectal surgery with anastomosis were included. C-reactive protein and procalcitonin were measured daily until the fourth postoperative day. Postoperative infections were recorded according to the definitions of the Centres for Diseases Control. The areas under the receiver operating characteristic curve were analyzed and compared to assess the diagnostic accuracy of each marker.

**RESULTS:**

Five-hundred and one patients were analyzed. The incidence of intra-abdominal infection was 11.8%, with 24.6% of patients presenting at least one infectious complication. Overall mortality was 1.2%. At the fourth postoperative day, C-reactive protein was more discriminating than procalcitonin for the detection of intra-abdominal infection (areas under the ROC curve: 0.775 vs 0.689, respectively, P = 0.03). Procalcitonin levels showed wide dispersion. For the detection of all infectious complications, C-reactive protein was also significantly more accurate than procalcitonin on the fourth postoperative day (areas under the ROC curve: 0.783 vs 0.671, P = 0.0002).

**CONCLUSIONS:**

C-reactive protein is more accurate than procalcitonin for the detection of infectious complications and should be systematically measured at the fourth postoperative day. It is a useful tool to ensure a safe early discharge after elective colorectal surgery.

Maybe procalcitonin is not all that it was hoped it would be… C-reactive protein was better at detecting intra-abdominal infection, and it still was not particularly discriminative in those undergoing colorectal surgery. We guess we have to keep looking, and continue to rely on the tried and true physical exam.



[See comment in PubMed Commons below](http://www.ncbi.nlm.nih.gov/pubmed/26338329#comments)

1. [J Neurosci.](http://www.ncbi.nlm.nih.gov/pubmed/26338329) 2015 Sep 2;35(35):12188-97. doi: 10.1523/JNEUROSCI.5420-13.2015.

**Effects of Peritoneal Sepsis on Rat Central Osmoregulatory Neurons Mediating Thirst and Vasopressin Release.**

[Stare J](http://www.ncbi.nlm.nih.gov/pubmed/?term=Stare%20J%5BAuthor%5D&cauthor=true&cauthor_uid=26338329)1, [Siami S](http://www.ncbi.nlm.nih.gov/pubmed/?term=Siami%20S%5BAuthor%5D&cauthor=true&cauthor_uid=26338329)2, [Trudel E](http://www.ncbi.nlm.nih.gov/pubmed/?term=Trudel%20E%5BAuthor%5D&cauthor=true&cauthor_uid=26338329)3, [Prager-Khoutorsky M](http://www.ncbi.nlm.nih.gov/pubmed/?term=Prager-Khoutorsky%20M%5BAuthor%5D&cauthor=true&cauthor_uid=26338329)3, [Sharshar T](http://www.ncbi.nlm.nih.gov/pubmed/?term=Sharshar%20T%5BAuthor%5D&cauthor=true&cauthor_uid=26338329)4, [Bourque CW](http://www.ncbi.nlm.nih.gov/pubmed/?term=Bourque%20CW%5BAuthor%5D&cauthor=true&cauthor_uid=26338329)5.

**Abstract**

Sepsis is a life-threatening condition caused by the systemic inflammatory response to a bacterial infection. Although much is known about the cellular and molecular changes that characterize the peripheral inflammatory response to sepsis, almost nothing is known of the neuronal changes that cause associated perturbations in the central control of homeostasis. Osmoregulation is one of the key homeostatic systems perturbed during sepsis. In healthy subjects, systemic hypertonicity normally excites osmoreceptor neurons in the organum vasculosum laminae terminalis (OVLT), which then activates downstream neurons that induce a parallel increase in water intake and arginine vasopressin (AVP) secretion and promote fluid expansion. However, recent studies have shown that the early phase of sepsis is associated with increased AVP levels and suppressed thirst. Here we examined the electrophysiological properties of OVLT neurons and magnocellular neurosecretory cells (MNCs) in acute in vitro preparations obtained from rats subjected to sham surgery or cecal ligation and puncture (CLP). We found that the intrinsic excitability of OVLT neurons was not affected significantly 18-24 h after CLP. However, OVLT neurons in CLP rats were hyperpolarized significantly compared with shams. Moreover, a reduced proportion of these cells displayed spontaneous electrical activity and osmoresponsiveness in septic animals. In contrast, the osmoresponsiveness of MNCs was only attenuated by CLP, and a larger proportion of these neurons displayed spontaneous electrical activity in septic animals. These results suggest that acute sepsis disrupts centrally mediated osmoregulatory reflexes through differential effects on the properties of neurons in the OVLT and supraoptic nucleus.

**SIGNIFICANCE STATEMENT:**

Sepsis is a life-threatening condition caused by the systemic inflammatory response to bacterial infection. Although the early phase of sepsis features impaired thirst and enhanced vasopressin release, the basis for these defects is unknown. Here, we show that cecal ligation and puncture (CLP) in rats impairs the osmoresponsiveness of neurons in the organum vasculosum lamina terminalis (OVLT; which drives thirst) and attenuates that of neurosecretory neurons in the supraoptic nucleus (SON; which secrete oxytocin and vasopressin). Notably, we found that OVLT neurons are hyperpolarized and electrically silenced. In contrast, CLP increased the proportion of SON neurons displaying spontaneous electrical activity. Therefore, CLP affects the properties of osmoregulatory neurons in a manner that can affect systemic osmoregulation.

An interesting finding that corroborates clinical experience. Perhaps this is related to the serum sodium variability commonly seen in the surgical ICU.

[See comment in PubMed Commons below](http://www.ncbi.nlm.nih.gov/pubmed/26381144#comments)

1. [PLoS One.](http://www.ncbi.nlm.nih.gov/pubmed/26381144) 2015 Sep 18;10(9):e0138043. doi: 10.1371/journal.pone.0138043. eCollection 2015.

**Propofol Increases Host Susceptibility to Microbial Infection by Reducing Subpopulations of Mature Immune Effector Cells at Sites of Infection.**

[Visvabharathy L](http://www.ncbi.nlm.nih.gov/pubmed/?term=Visvabharathy%20L%5BAuthor%5D&cauthor=true&cauthor_uid=26381144)1, [Xayarath B](http://www.ncbi.nlm.nih.gov/pubmed/?term=Xayarath%20B%5BAuthor%5D&cauthor=true&cauthor_uid=26381144)1, [Weinberg G](http://www.ncbi.nlm.nih.gov/pubmed/?term=Weinberg%20G%5BAuthor%5D&cauthor=true&cauthor_uid=26381144)2, [Shilling RA](http://www.ncbi.nlm.nih.gov/pubmed/?term=Shilling%20RA%5BAuthor%5D&cauthor=true&cauthor_uid=26381144)3, [Freitag NE](http://www.ncbi.nlm.nih.gov/pubmed/?term=Freitag%20NE%5BAuthor%5D&cauthor=true&cauthor_uid=26381144)1.

**Abstract**

Anesthetics are known to affect host immune responses, but separating the variables of surgery from anesthesia when analyzing hospital acquired infections is often difficult. Here, the bacterial pathogen Listeria monocytogenes (Lm) was used to assess the impact of the common anesthetic propofol on host susceptibility to infection. Brief sedation of mice with physiologically relevant concentrations of propofol increased bacterial burdens in target organs by more than 10,000-fold relative to infected control animals. The adverse effects of propofol sedation on immune clearance of Lm persisted after recovery from sedation, as animals given the drug remained susceptible to infection for days following anesthesia. In contrast to propofol, sedation with alternative anesthetics such as ketamine/xylazine or pentobarbital did not increase susceptibility to systemic Lm infection. Propofol altered systemic cytokine and chemokine expression during infection, and prevented effective bacterial clearance by inhibiting the recruitment and/or activity of immune effector cells at sites of infection. Propofol exposure induced a marked reduction in marginal zone macrophages in the spleens of Lm infected mice, resulting in bacterial dissemination into deep tissue. Propofol also significantly increased mouse kidney abscess formation following infection with the common nosocomial pathogen Staphylococcus aureus. Taken together, these data indicate that even brief exposure to propofol severely compromises host resistance to microbial infection for days after recovery from sedation.

Well, this is of interest… Does anaesthetic technique drive some surgical infections? Maybe this is true of other agents such as benzodiazepines and opioids (some evidence to suggest this already). Do we need other alternatives? For this study in particular, we suppose that this could be addressed with observational data that is available in many EMR systems, or perhaps some of the larger databases, and would seem to be a ripe area for investigation.

1. [Surgery.](http://www.ncbi.nlm.nih.gov/pubmed/25920911) 2015 Jul;158(1):66-77. doi: 10.1016/j.surg.2015.03.009. Epub 2015 Apr 25.

**Do surgical care bundles reduce the risk of surgical site infections in patients undergoing colorectal surgery? A systematic review and cohort meta-analysis of 8,515 patients.**

[Tanner J](http://www.ncbi.nlm.nih.gov/pubmed/?term=Tanner%20J%5BAuthor%5D&cauthor=true&cauthor_uid=25920911)1, [Padley W](http://www.ncbi.nlm.nih.gov/pubmed/?term=Padley%20W%5BAuthor%5D&cauthor=true&cauthor_uid=25920911)2, [Assadian O](http://www.ncbi.nlm.nih.gov/pubmed/?term=Assadian%20O%5BAuthor%5D&cauthor=true&cauthor_uid=25920911)3, [Leaper D](http://www.ncbi.nlm.nih.gov/pubmed/?term=Leaper%20D%5BAuthor%5D&cauthor=true&cauthor_uid=25920911)3, [Kiernan M](http://www.ncbi.nlm.nih.gov/pubmed/?term=Kiernan%20M%5BAuthor%5D&cauthor=true&cauthor_uid=25920911)4, [Edmiston C](http://www.ncbi.nlm.nih.gov/pubmed/?term=Edmiston%20C%5BAuthor%5D&cauthor=true&cauthor_uid=25920911)5.

**Abstract**

**BACKGROUND:**

Care bundles are a strategy that can be used to reduce the risk of surgical site infection (SSI), but individual studies of care bundles report conflicting outcomes. This study assesses the effectiveness of care bundles to reduce SSI among patients undergoing colorectal surgery.

**METHODS:**

We performed a systematic review and meta-analysis of randomized controlled trials, quasi-experimental studies, and cohort studies of care bundles to reduce SSI. The search strategy included database and clinical trials register searches from 2012 until June 2014, searching reference lists of retrieved studies and contacting study authors to obtain missing data. The Downs and Black checklist was used to assess the quality of all studies. Raw data were used to calculate pooled relative risk (RR) estimates using Cochrane Review Manager. The I(2) statistic and funnel plots were performed to identify publication bias. Sensitivity analysis was carried out to examine the influence of individual data sets on pooled RRs.

**RESULTS:**

Sixteen studies were included in the analysis, with 13 providing sufficient data for a meta-analysis. Most study bundles included core interventions such as antibiotic administration, appropriate hair removal, glycemic control, and normothermia. The SSI rate in the bundle group was 7.0% (328/4,649) compared with 15.1% (585/3,866) in a standard care group. The pooled effect of 13 studies with a total sample of 8,515 patients shows that surgical care bundles have a clinically important impact on reducing the risk of SSI compared to standard care with a CI of 0.55 (0.39-0.77; P = .0005).

**CONCLUSION:**

The systematic review and meta-analysis documents that use of an evidence-based, surgical care bundle in patients undergoing colorectal surgery significantly reduced the risk of SSI.

Finally, something that is expected. The observations of many studies are pooled here to show the utility of bundling of standard practices to reduce infections in colorectal surgery. In most of these bundles, the interventions are relatively low cost and have been shown independently beneficial. So, the checklists that we follow have some benefit. We expect that the use of bundles and checklists will continue to proliferate where it is profitable.

[See comment in PubMed Commons below](http://www.ncbi.nlm.nih.gov/pubmed/26235905#comments)

1. [J Surg Res.](http://www.ncbi.nlm.nih.gov/pubmed/26235905) 2015 Jul 8. pii: S0022-4804(15)00746-5. doi: 10.1016/j.jss.2015.07.001. [Epub ahead of print]

**Anti-inflammatory and anti-bacterial effects of iron chelation in experimental sepsis.**

[Islam S](http://www.ncbi.nlm.nih.gov/pubmed/?term=Islam%20S%5BAuthor%5D&cauthor=true&cauthor_uid=26235905)1, [Jarosch S](http://www.ncbi.nlm.nih.gov/pubmed/?term=Jarosch%20S%5BAuthor%5D&cauthor=true&cauthor_uid=26235905)2, [Zhou J](http://www.ncbi.nlm.nih.gov/pubmed/?term=Zhou%20J%5BAuthor%5D&cauthor=true&cauthor_uid=26235905)3, [Parquet MD](http://www.ncbi.nlm.nih.gov/pubmed/?term=Parquet%20MD%5BAuthor%5D&cauthor=true&cauthor_uid=26235905)4, [Toguri JT](http://www.ncbi.nlm.nih.gov/pubmed/?term=Toguri%20JT%5BAuthor%5D&cauthor=true&cauthor_uid=26235905)5, [Colp P](http://www.ncbi.nlm.nih.gov/pubmed/?term=Colp%20P%5BAuthor%5D&cauthor=true&cauthor_uid=26235905)6, [Holbein BE](http://www.ncbi.nlm.nih.gov/pubmed/?term=Holbein%20BE%5BAuthor%5D&cauthor=true&cauthor_uid=26235905)4, [Lehmann C](http://www.ncbi.nlm.nih.gov/pubmed/?term=Lehmann%20C%5BAuthor%5D&cauthor=true&cauthor_uid=26235905)7.

**Abstract**

**BACKGROUND:**

Sepsis is the systemic inflammatory response to an infection. Generation of reactive oxygen species represents an important part of the inflammatory cascade in sepsis. Dysregulation of iron homeostasis can further promote the generation of radicals and amplify the damage caused by systemic immune activation. This can potentially be suppressed or prevented by iron chelation. Therefore, this study was designed to examine the effects of a novel iron chelator (DIBI) with or without standard antibiotic treatment in colon ascendens stent peritonitis (CASP)-induced experimental sepsis.

**METHODS:**

Six groups of animals (n = 7-10) were included in the study: sham surgery; untreated CASP animals; CASP and subcutaneous (sc) or intraperitoneal DIBI administration, respectively; CASP and imipenem sc; and combination of DIBI and imipenem sc.

**RESULTS:**

We observed a 55% reduction in leukocyte adhesion in V1 venules after sc administration of DIBI and a 40% reduction after imipenem treatment, when compared to untreated CASP animals (P < 0.05). A further reduction in the number of adherent leukocytes in V1 venules was observed after combined treatment with DIBI and imipenem (66%). A significant decrease in bacterial count was observed from 2200 (150-64,000) to 100 (1-420) colony forming units per milliliter in blood in the sc DIBI and imipenem combination group (P = 0.0065). The bacterial count in the peritoneal lavage fluid was also significantly reduced in the sc imipenem group and the sc DIBI and imipenem combination group (P = 0.0021 and P = 0.0001, respectively) when compared to untreated CASP animals.

**CONCLUSIONS:**

These findings suggest a potential role of iron chelators in the treatment of sepsis.

Iron metabolism is likely to play a functional role in the response to infection, which is corroborated here. Maybe the almost universal finding of anemia in the critically ill is a well-conserved response along these lines, which could be augmented by iron chelation. Further studies are justified.