

Supplement to the Management of Surgical Site Infections Systematic Literature Review

e-Appendix 1

- Background
- Work Group Roster
- PICO Questions
- AAOS Approval Bodies
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This supplementary material has been provided by the authors to give readers additional information about their work

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GUIDELINE DEVELOPMENT GROUP ROSTER

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Appendix II

AAOS BODIES THAT APPROVED THIS SYSTEMATIC LITERATURE REVIEW

Committee on Evidence Based Quality and Value

The committee on Evidence Based Quality and Value (EBQV) consists of twenty AAOS members who implement evidence-based quality initiatives such as clinical practice guidelines (CPGs), systematic literature reviews (SRs) and appropriate use criteria (AUCs). They also oversee the dissemination of related educational materials and promote the utilization of orthopaedic value products by the Academy's leadership and its members.

Council on Research and Quality

The Council on Research and Quality promotes ethically and scientifically sound clinical and translational research to sustain patient care in musculoskeletal disorders. The Council also serves as the primary resource for educating its members, the public, and public policy makers regarding evidenced-based medical practice, orthopaedic devices and biologics, regulatory pathways and standards development, patient safety, occupational health, technology assessment, and other related important errors.

The Council is comprised of the chairs of the committees on Biological Implants, Biomedical Engineering, Occupational Health and Workers' Compensation, Patient Safety, Research Development, U.S. Bone and Joint Decade, and chair and Appropriate Use Criteria and Guidelines section leaders of the Evidence Based Quality and Value committee. Also on the Council are the second vice-president, three members at large, and representatives of the Diversity Advisory Board, Women's Health Issues Advisory Board, Board of Specialty Societies (BOS), Board of Councilors (BOC), Communications Cabinet, Orthopaedic Research Society (ORS), Orthopedic Research and Education Foundation (OREF).

Board of Directors

The 17 member Board of Directors manage the affairs of the AAOS, set policy, and oversee the Strategic Plan.

PICO QUESTIONS

SSI PICOs

1. In adult, children, and geriatric patients who have a suspected postoperative surgical site infection, which diagnostic modalities are the most useful when diagnosing SSIs?

2.
 - a. In adults, children, and geriatric patients who have a diagnosed postoperative surgical site infection, are there modifiable patient risk factors that are associated with a more optimal outcome?
 - b. In adults, children, and geriatric patients who have a diagnosed postoperative surgical site infection, what is the best management strategy to help modify these risk factors?

3.
 - a. In patients with a post-operative SSI, which antibiotics are effective at treating infections **prior to the review of culture results?**
 - b. In patients without an orthopedic implant and a post-operative SSI, which antibiotics are effective in treatment of infections?
 - c. In patients with an orthopedic implant and a post-operative SSI, which antibiotics are more effective at treating infections?

4.
 - a. In patients who have post-operative SSI, what is the evidence for the role and timing of surgery?
 - b. In patients who have post-operative SSI, what is the evidence for the role and timing of implant removal?
 - c. In patients who have post-operative SSI, what is the evidence for the role and timing of percutaneous drainage?

5. In adult, children, and geriatric patients with SSIs, what adjunctive treatments improve the resolution of infection?

6. In patients with acute postop orthopedic SSI, what is the evidence for multidisciplinary care of SSI?

1. In adult, children, and geriatric patients who have a suspected postoperative surgical site infection, which diagnostic modalities are the most useful when diagnosing SSIs?

-Diagnostic Modalities:

- a) Diagnostic tests
- b) Inflammatory Markers (e.g. IL6)
- c) Lab values (e.g. PCR)
- d) Imaging
- e) History and Exam
- f) Cultures/biopsy (report what methodology is used to produce cultures)

2a. In adults, children, and geriatric patients who have a diagnosed postoperative surgical site infection, are there modifiable patient risk factors that are associated with a more optimal outcome?

-Modifiable Risk Factors:

- a) Smoking (all tobacco products, including smokeless tobacco),
- b) Nutrition
- c) Diabetes
- d) Anemia
- e) Immune suppressing medications (azathioprine, cyclosporine, monoclonal antibodies, corticosteroids)
- f) Ischemia
- g) Wound closure
- h) Perfusion
- i) Coagulopathy
- j) Medical comorbidities
- k) Post-op oxygenation
- l) HBO (hyperbaric chamber)
- m) Any other modifiable risk factors in research

3a. In patients with a post-operative SSI, which antibiotics are effective at treating infections **prior to the review of culture results**?

3b. In patients without an orthopedic implant and a post-operative SSI, which antibiotics are effective in treatment of infections?

3c. In patients with an orthopedic implant and a post-operative SSI, which antibiotics are more effective at treating infections?

Antibiotics:

- a. Various antibiotics (class)
 - b. Route (oral vs IV, possibly local/topical)
 - c. Duration
 - d. Antimicrobial treatments

4a. In patients who have post-operative SSI, what is the evidence for the role and timing of surgery?

4b. In patients who have post-operative SSI, what is the evidence for the role and timing of implant removal?

Timing:

- a) Immediate removal
- b) Staged (delayed removal and staged re-implant)

Vs.

- a) Versus staged removal or no removal (i.e. implant retention)
- b) Versus Immediate removal or no removal (i.e. implant retention)

4c. In patients who have post-operative SSI, what is the evidence for the role and timing of percutaneous drainage?

Percutaneous drainage:

- a) Interventional radiology (Catheter, percutaneous drainage, fluid collections)

Vs.

- a) Versus no interventional radiology or other interventional radiological techniques
- b) Various timing of when interventional radiology (percutaneous drainage) occurs)

5. In adult, children, and geriatric patients with SSIs, what adjunctive treatments improve the resolution of infection?

Adjunctive Tx:

- a) Wound vacs (negative pressure wound therapy)
- b) Irrigation with additives (antiseptic and antimicrobial)
- c) Local delivery
- d) Soft tissue reconstruction (flaps)

6. In patients with acute postop orthopedic SSI, what is the evidence for multidisciplinary care of SSI?

Multidisciplinary care:

- a) ID Consultant (infectious disease)
- b) HBO
- c) Plastic surgery
- d) Interventional radiology
- e) Wound care
- f) Hospitalist
- g) Post-acute care (e.g., home care)

LITERATURE SEARCH STRATEGIES

Date: March 13, 2017

Total search results: 5,064

De-duplicated: 4,120

Ref IDs: 20665-25728

Limited to English language, Conference abstracts removed during de-duplication process.

PUBMED

Interface: <http://www.ncbi.nlm.nih.gov/pubmed/>

Search Results: 15,929 (15,737 de-duplicated); 2,583 (2,558)

Ref IDs: 1-15929; 20665-23247

#1 "Surgical Wound Infection"[Mesh] OR "Surgical Wound Dehiscence"[Mesh] OR surgical site infection[ot]

#2 "Postoperative Complications"[Mesh] AND ("Prosthesis-Related Infections"[Mesh] OR "Sepsis"[mh] OR "Bacterial Infections"[mh] OR "Bacteria"[mh] OR "Mycoses"[mh] OR "Wound Infection"[mh] OR "Soft Tissue Infections"[mh])

#3((publisher[sb] NOT pubstatusnihms NOT pubstatuspmcsd NOT pmcbook) OR inprocess[sb]) AND ((post operative*[tiab] OR postoperative*[tiab] OR postsurg*[tiab] OR post surg*[tiab] OR surger*[tiab] OR surgical*[tiab]) AND (infected[tiab] OR infection*[tiab] OR sepsis[tiab] OR septic[tiab]))

#4#1 OR #2 OR #3 (SSI CONCEPT)

#5 orthop*[tiab] OR arthroplast*[tiab] OR revision*[tiab] OR replacement*[tiab] OR reconstruction[tiab] OR arthroscop*[tiab] OR fracture*[tiab] OR rupture*[tiab] OR trauma*[tiab] OR dislocat*[tiab] OR joint*[tiab] OR extrem*[tiab] OR fixation[tiab] OR fusion[tiab]

#6 "Orthopedic Procedures"[mh] OR "Musculoskeletal Diseases"[mh] OR "Arm Injuries"[mh] OR "Athletic Injuries"[mh] OR "Back Injuries"[mh] OR "Dislocations"[mh] OR "Fractures, Bone"[mh] OR "Fractures, Cartilage"[mh] OR "Hand Injuries"[mh] OR "Hip Injuries"[mh] OR "Leg Injuries"[mh] OR "Multiple Trauma"[mh] OR "Neck Injuries"[mh] OR "Soft Tissue Injuries"[mh] OR "Spinal Cord Injuries"[mh] OR "Spinal Injuries"[mh] OR "Sprains and Strains"[mh] OR "Tendon Injuries"[mh]

#7#5 OR #6 (ORTHO CONCEPT)

#8 (animal[mh] NOT human[mh]) OR cadaver[mh] OR cadaver*[ti] OR comment[pt] OR editorial[pt] OR letter[pt] OR "historical article"[pt] OR addresses[pt] OR news[pt] OR "newspaper article"[pt] OR "case report"[ti]

#9((#4 AND #7) NOT #8) AND 1966:2015[pdat] AND English[la]

EMBASE

Interface: <http://www.embase.com/>

Search Results: 3,653 (3,165); 2,116 (1,467)

Ref IDs: 15930-19582; 23248-25363

#1'surgical infection'/exp OR 'postoperative infection'/exp OR 'wound dehiscence'/exp
OR ('postoperative complication'/de AND ('infection'/exp OR 'wound infection'/exp))
#2(('post operative' OR 'post operatively' OR postoperative* OR surg* OR postsurg* OR
'post surgical' OR 'post surgically' OR 'post surgery') NEAR/5 (infect* OR dehiscen* OR
sepsis OR septic)):ab,ti
#3 #1 OR #2 (SSI concept)
#4'orthopedic surgery'/exp OR 'musculoskeletal disease'/exp OR 'orthopedic
endoprosthesis'/exp OR 'orthopedic prosthesis'/exp (ortho concept)
#5cadaver/de OR 'in vitro study'/exp OR 'abstract report'/de OR book/de OR editorial/de
OR note/de OR letter/de OR 'case study'/de OR 'case report'/de OR 'conference
abstract'/it
#6(#3 AND #4) NOT #5
#7 #6 AND [english]/lim AND [1966-2015]/py AND ([embase]/lim NOT [medline]/lim)

COCHRANE CENTRAL REGISTER OF CONTROLLED TRIALS (CENTRAL)
Interface: Wiley Online Library (<http://onlinelibrary.wiley.com/cochranelibrary/search>)
Search Results: 1,082 (530); 365 (95)
Ref IDs: 19583-20664; 25375-25728

#1(("post operative" or "post operatively" or postoperative* or surg* or postsurg* or "post surgical" or "post surgically" or "post surgery") near/5 (infect* or dehiscen* or sepsis or septic)):ti,ab,kw

#2"surgical site infection":ti,ab,kw"

#3(orthop* OR arthroplast* OR replacement* OR reconstruction OR arthroscop* OR fracture* OR trauma* OR dislocat* OR joint* OR extremit* OR fixation OR fusion):ti,ab,kw

#4"conference abstract":pt

#5(#1 OR #2) AND #3

#6#5 NOT #4

Publication Year from 1966 to 2015

PARTICIPATING PEER REVIEW ORGANIZATIONS

Peer review of the systematic literature review is completed by interested external organizations. The AAOS solicits reviewers for each systematic literature review . They consist of experts in the topic area and represent professional societies other than AAOS. Review organizations are nominated by the systematic literature review development group at the introductory meeting.

Peer review and public comment responses are available on www.aaos.org/guidelines.

Participation in the AAOS systematic literature review peer review process does not constitute an endorsement nor does it imply that the reviewer supports this document.

STRUCTURED PEER REVIEW FORM

Peer reviewers are asked to read and review the draft of the systematic literature review with a particular focus on their area of expertise. Their responses to the answers below are used to assess the validity, clarity, and accuracy of the interpretation of the evidence.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. The overall objective(s) of the guideline is (are) specifically described.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The health question(s) covered by the guideline is (are) specifically described.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The guideline's target audience is clearly described.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The guideline development group includes individuals from all the relevant professional groups.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. There is an explicit link between the recommendations and the supporting evidence.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Given the nature of the topic and the data, all clinically important outcomes are considered.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The patients to whom this guideline is meant to apply are specifically described.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The criteria used to select articles for inclusion are appropriate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The reasons why some studies were excluded are clearly described.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. All important studies that met the article inclusion criteria are included.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. The validity of the studies is appropriately appraised.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. The methods are described in such a way as to be reproducible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. The statistical methods are appropriate to the material and the objectives of this guideline.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Important parameters (e.g., setting, study population, study design) that could affect study results are systematically addressed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Health benefits, side effects, and risks are adequately addressed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. The writing style is appropriate for health care professionals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. The grades assigned to each recommendation are appropriate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline.

Would you recommend these guidelines for use in clinical practice?*

- Strongly Recommend
- Recommend
- Would Not Recommend
- Unsure

Additional Comments:

To view an example of the structured peer review form, please select the following link:
[Structured Peer Review Form](#)

LETTERS OF ENDORSEMENT FROM EXTERNAL ORGANIZATIONS

Kaitlyn S. Sevarino, MBA
Manager, Quality and Value Implementation
Department of Research, Quality, & Scientific Affairs

Dear Kaitlyn:

The Arthroscopy Association of North America has voted to endorse the AAOS Management of Surgical Site Infections Systematic Review. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this systematic review and reprint our logo in the introductory section of the systematic review document.

Sincerely,

Eric Stiefel

Eric Stiefel, MD
Advocacy Committee Chair



July 16, 2018

Kaitlyn S. Sevarino, MBA
Manager, Quality and Value Implementation
Department of Research, Quality, & Scientific Affairs

Dear Ms. Sevarino,

The Pediatric Orthopaedic Society of North America (POSNA) agrees to endorse the AAOS Management of Surgical Site Infections Systematic Review. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this systematic review and reprint our logo in the introductory section of the systematic review document.

Sincerely,

Teri Stech
Society Director

9400 West Higgins Road, Suite 500
Rosemont, IL 60018-4976



Kaitlyn S. Sevarino, MBA
Manager, Quality and Value Implementation
Department of Research, Quality, & Scientific Affairs

Dear Ms. Sevarino,

The Musculoskeletal Infection Society (MSIS) has voted to endorse the AAOS Management of Surgical Site Infections Systematic Review. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this systematic review and reprint our logo in the introductory section of the systematic review document.

Sincerely,

Antonia F. Chen MD/MBA

President, Musculoskeletal Infection Society

Kaitlyn S. Sevarino, MBA
Manager, Quality and Value Implementation
Department of Research, Quality, & Scientific Affairs

Dear Ms. Sevarino,

The OTA has voted to endorse the AAOS Management of Surgical Site Infections Systematic Review. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this systematic review and reprint our logo in the introductory section of the systematic review document.

Sincerely,

Kathleen Caswell
OTA Executive Director

Kaitlyn S. Sevarino, MBA
Manager, Quality and Value Implementation
Department of Research, Quality, & Scientific Affairs

Dear Ms. Sevarino,

The American Physical Therapy Association has voted to endorse the AAOS Management of Surgical Site Infections Systematic Review. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this systematic review and reprint our logo in the introductory section of the systematic review document.

Sincerely,

A handwritten signature in black ink that reads "Sharon L. Dunn". The signature is written in a cursive, flowing style.

Sharon L. Dunn, PT, PhD
Board-Certified Clinical Specialist in Orthopaedic Physical Therapy
President