
Management of Surgical Site Infections in Orthopaedics
Wolters Kluwer
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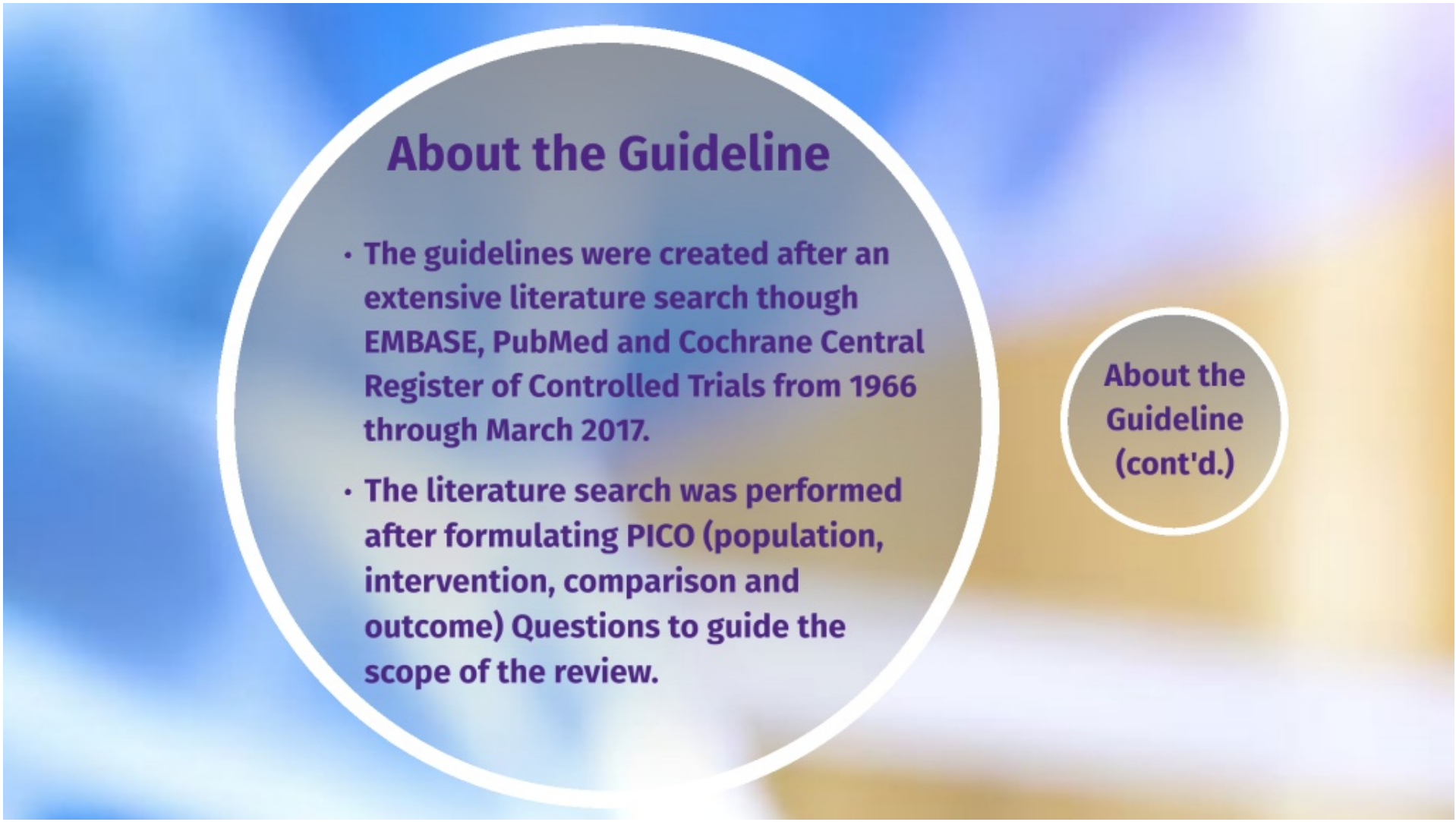
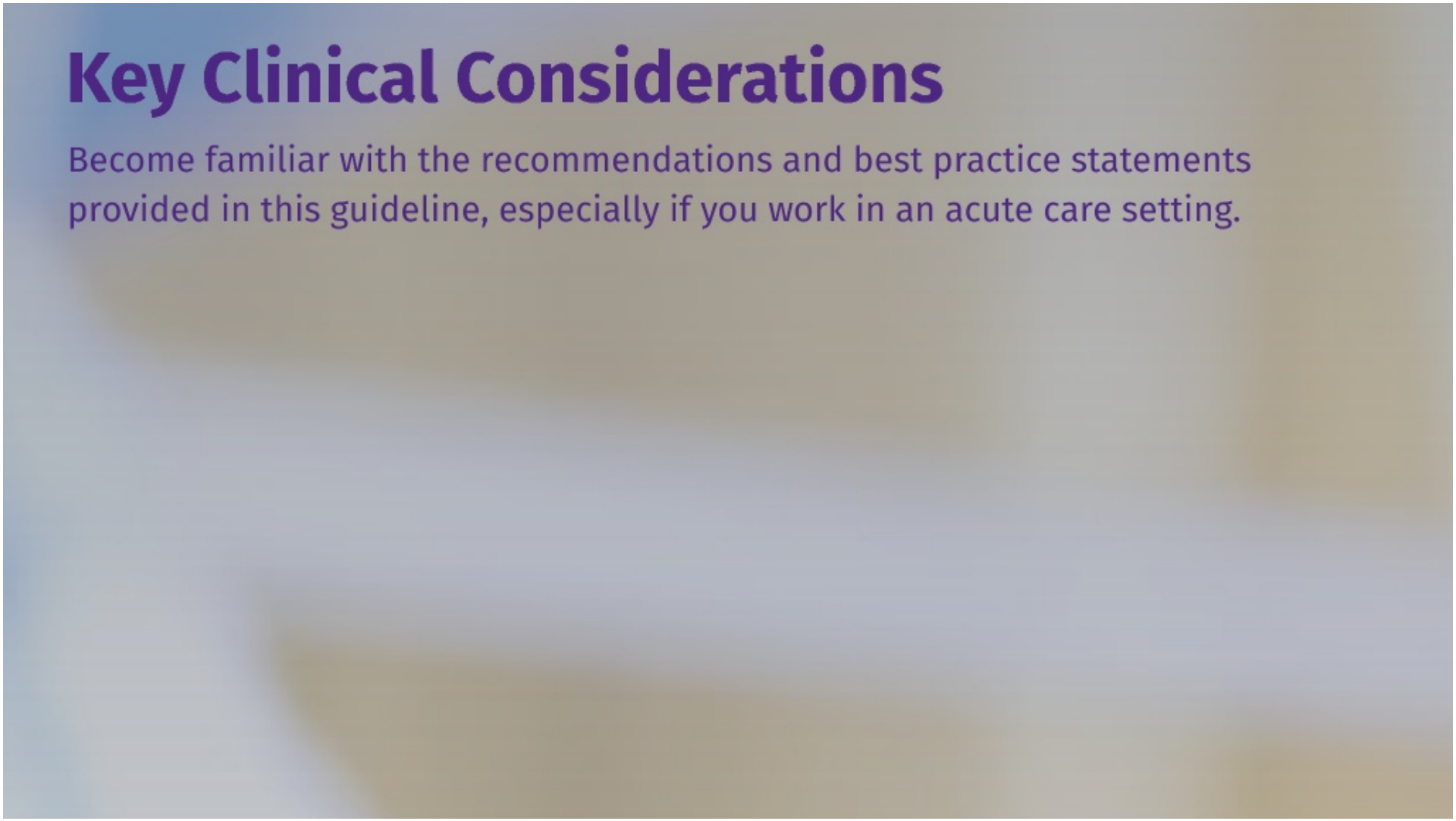

About the Guideline
• The guidelines were created after an extensive literature search though EMBASE, PubMed and Cochrane Central Register of Controlled Trials from 1966 through March 2017.
• The literature search was performed after formulating PICO (population, intervention, comparison and outcome) Questions to guide the scope of the review.
About the Guideline (cont'd.)

About the Guideline

- Physician experts formed the American Academy of Orthopaedic Surgeons (AAOS) Management of Surgical Site Infections group, along with AAOS Quality and Value Unit in the Department of Research and Methodologists from Quality and Scientific Affairs group.
- The majority of the literature that was reviewed and the data that was collected involved hip and knee arthroplasty.


Key Clinical Considerations
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- Surgical Site Infections (SSIs) occur in approximately 1% of orthopaedic patients.
- The infection may be superficial, involving bacteria or fungi entering through the surgical wound and only affecting the skin around the incision, or it may be more serious affecting the deep tissue, organs and/or implanted materials.
- Currently the Centers for Disease Control and Prevention (CDC) considers an infection a SSI when it occurs within 30 days from day of surgery (Day #1).

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- ***Radiography*** - may be considered for initial imaging to assess the site and describe features of infection.
- ***Radiolabeled Leukocyte Imaging*** - In conjunction with other diagnostic tools, this imaging study may be used either to rule-in or rule-out a prosthetic joint infection (PJI) but should not be used as the lone study. Specificity is increased when used with bone marrow scintigraphy.

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- ***Tc-99m Diphosphonate Skeletal Scintigraphy ('Bone Scan")***
  In PJI that occur a year after surgery, this is a useful diagnostic study to rule-out infection when radiolabeled leukocyte imaging is not available. A bone scan is limited by itself to diagnose such an infection.

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- ***Positron Emission Tomography (PET) Imaging***
  Because of the expense of PET scans, limited reimbursement and availability, rationalizing its use to rule-in or rule-out an infection is not suggested. Although in some circumstances it may be considered a useful diagnostic test in conjunction with other studies.

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- ***Cross-Sectional Imaging (Magnetic Resonance Imaging, Computed Tomography, Ultrasonography)***
  Cross-sectional imaging may be useful in infections in which soft tissue fluid collections occur and therapeutic/diagnostic aspirations or biopsies may be needed, and the imaging is utilized for guidance to obtain them.

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- ***Prior Antibiotic Exposure***
  - Antibiotic treatment started within 14 days of the specimen collection, provided a lower culture yield.

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- Determining a periprosthetic infection is solidified with a positive CRP value and ruled out with a negative value. It was found to be both sensitive and specific in such infections.
- In cases of neoplasms, metabolic syndrome, and chronic inflammatory conditions, CRP can be elevated and may confuse a final diagnosis, therefore should be followed and evaluated accordingly to determine the cause of the elevated level.

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- In combination with other diagnostic tools, ESR may be utilized to diagnose infection, but alone the result is too inconsistent when surgery, inflammation and other factors are involved.

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Clinical exam for the diagnosis of SSIs

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- Clinical exams should be included with the history, along with diagnostic studies.
- The absence of pain does not necessarily coincide with the absence of infection.

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The factors below are associated with an increased risk of SSI with strong supporting evidence:

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- Anemia
- Duration of hospital stay
  - Both lengthy pre- and post-op hospital stays are associated with an increased risk of SSI.
  - Early discharge to avoid infections should not take place until any unstable medical conditions are assessed and identified.
  - Discharge pathways should be utilized.

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- Immunosuppressive medications
  - Careful consideration should be given to patients on immunosuppressive medications, as there is a strong correlation associated with the risk of SSI.
  - Discontinuing immunosuppressive medications may cause a flare up of an inflammatory disease. The American College of Rheumatology and the American Association of Hip and Knee Surgeons developed guidelines [https://www.rheumatology.org/Portals/0/Files/ACR-AAHKS-Perioperative-Management-Guideline.pdf] for the perioperative management of antirheumatic medications.

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  - CHF is associated with various vascular complications along with SSI.
- Dementia
  - Dementia is an independent risk factor for SSI.
- Human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS)
  - Prior to orthopedic surgery, control of opportunistic infections should be attained.

Key Clinical Considerations

Moderate evidence of increased associated risk of SSI

Patients meeting any of the following criteria are at an increased risk of SSI after hip and knee arthroplasty:

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Patients meeting any of the following criteria are at an increased risk of SSI after hip and knee arthroplasty:

- Chronic Kidney Disease
  - A definitive correlation exists between severity of kidney disease and the risk of SSI.
- Diabetes
  - A specific correlation between diabetes and SSI was conflicting in the studies that were reviewed.
  - The risk of over or under-controlling blood sugar levels, both preoperatively and postoperatively, may increase the risk of SSI in diabetic patients.

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- Tobacco Use/Smoking
  - An exact correlation between smoking and SSI was not identified; however, smoking cessation counseling is of benefit to decrease various other risks to the surgical patient.

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- Tobacco Use/Smoking
  - An exact correlation between smoking and SSI was not identified; however, smoking cessation counseling is of benefit to decrease various other risks to the surgical patient.
- Malnutrition
  - Increased risk of hypoalbuminemia and SSI was identified in patients that were malnourished.
  - Malnutrition is a known surgical risk, regardless of SSI.

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Limited evidence of increased associated risk of SSI

Patients meeting any of the following criteria may be at an increased risk of infection after hip and knee arthroplasty:

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Patients meeting any of the following criteria may be at an increased risk of infection after hip and knee arthroplasty:

- Cancer

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- Hypertension (conflicting evidence)

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Limited evidence of increased associated risk of SSI

Patients meeting any of the following criteria may be at an increased risk of infection after hip and knee arthroplasty:

- Cancer
- Hypertension (conflicting evidence)
- Liver Disease (conflicting evidence)

Key Clinical Considerations

Antibiotic duration for the management of SSIs

Antibiotic protocols for retained total joint arthroplasty, of eight-week durations versus three to six months do not result in significantly different outcomes according to moderate supporting evidence.

Optimum length of antibiotic treatment is unknown.

Key Clinical Considerations

Rifampin use for management of SSIs

- Rifampin as a second antibiotic improves the treatment for staphylococcal infections with retained orthopedic implants according to moderate supporting evidence.
  - Rifampin should not be used as monotherapy and should be monitored by experts in the area of infectious disease due to the adverse interactions it poses.


Reference:
American Academy of Orthopedic Surgeons. Systematic Literature Review on the Management of Surgical Site Infections. Published June 9, 2018. https://www.aaos.org/uploadedFiles/PreProduction/Quality/Guidelines_and_Reviews/guidelines/SSI%20SR_6.9.18.pdf

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