PREMIER

2023 KNOWLEDGE-BASED HOME-STUDY CE FOR PHARMACISTS AND PHARMACY TECHNICIANS

Perioperative Antimicrobial Stewardship and Pharmacy's Role

Speaker: Sara Jordan Hyland, PharmD, BCCCP, Clinical Pharmacist, Grant Medical Center, Columbus, OH

Learning Objectives

Upon completion of this CE activity, the Pharmacist will be able to do the following:

- Explain key pharmacokinetic and mechanistic concepts of antibiotics as they pertain to surgical antimicrobial prophylaxis
- Select optimal surgical antimicrobial prophylaxis regimens based on patient- and surgery-specific factors
- Identify antibiotic applications unique to surgical patients, including irrigations, antibiotic-laden bone cement (ALBC), spacers, pastes, and powders
- Recognize best practices and clinical pharmacist roles in perioperative antimicrobial stewardshipIdentify patient awareness opportunities related to safe pharmaceutical waste disposal

Upon completion of this CE activity, the Pharmacy Technician will be able to do the following:

- Describe the role of prophylactic antibiotics in surgical patients
- Locate clinical practice guidelines pertaining to antibiotic use in surgical patients
- Identify antibiotic applications unique to surgical patients, including irrigations, antibiotic-laden bone cement (ALBC), spacers, pastes, and powders
- Recognize medication stocking needs and medication safety implications pertaining to antibiotic use in surgery

Accreditation Information:
ACPE UAN: 0122-0000-23-039-H01-P/T
CPE Credit Hours: 1.0 hour (0.1 CEU) of home-study CE credit
Release Date: June 5. 2023
Expiration Date: June 5, 2026
Disclosures: Dr. Jordan Hyland, the moderators and planners for this activity do not have relevant financial relationships to disclose with ineligible companies.
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2. View and listen to the recorded activity
3. Complete both the learning assessment questions and the activity evaluation.

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ACPE

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For any questions regarding the CE activity, please contact Jerry Frazier.

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2023 KNOWLEDGE-BASED HOME-STUDY CE
FOR PHARMACISTS AND PHARMACY TECHNICIANS

PERIOPERATIVE ANTIMICROBIAL STEWARDSHIP AND PHARMACY'S ROLE

Speaker:

Sara Jordan Hyland, PharmD, BCCCP
Clinical Pharmacist
Grant Medical Center
Columbus, OH

ACPE UAN: 0122-0000-23-039-H01-P/T

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Speaker Bio:

Sara J Hyland, PharmD, BCCCP is a clinical pharmacist for Perioperative Services and Emergency Medicine at Grant Medical Center (OhioHealth), a large community teaching hospital and Level 1 Trauma Center in Columbus, OH. She holds Bachelor of Science in Pharmaceutical Sciences and PharmD degrees from The Ohio State University College of Pharmacy. Sara completed a PGY1 Pharmacy Practice Residency at Grant Medical Center. She is a Board-Certified Critical Care Pharmacist. She precepts PGY1 and PGY2 pharmacy residents in research rotations and in clinical perioperative/orthopedics rotations. Her practice and research interests include analgesia/sedation, neuromuscular blockade/reversal, hemostasis, VTE prophylaxis, pharmacy practice, and implementation science related to emergency and perioperative medicine. She has published or presented numerous professional papers on a variety of topics. Dr. Hyland serves on the research committee for the ACCP Emergency Medicine Practice and Research Network.

Dr. Jordan Hyland, the moderators and the planners for this activity have no relevant financial relationship(s) with ineligible companies to disclose.

Perioperative Antimicrobial Stewardship and Pharmacy's Role

Sara J. Hyland, PharmD, BCCCP

Clinical Pharmacist - Perioperative Care and Emergency Medicine
OhioHealth Grant Medical Center | Columbus OH | April 2023
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Pharmacist Learning Objectives

1. Explain key pharmacokinetic and mechanistic concepts of antibiotics as they pertain to surgical antimicrobial prophylaxis
2. Select optimal surgical antimicrobial prophylaxis regimens based on patient- and surgery-specific factors
3. Identify antibiotic applications unique to surgical patients, including irrigations, antibiotic-laden bone cement (ALBC), spacers, pastes, and powders
4. Recognize best practices and clinical pharmacist roles in perioperative antimicrobial stewardship

2

Pharmacy Technician Learning Objectives

1. Describe the role of prophylactic antibiotics in surgical patients
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3. Identify antibiotic applications unique to surgical patients, including irrigations, antibiotic-laden bone cement (ALBC), spacers, pastes, and powders
4. Recognize medication stocking needs and medication safety implications pertaining to antibiotic use in surgery

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Disclosures and Disclaimers

- **Dr. Hyland, the moderator and planners have no relevant financial relationships with ineligible companies to disclose.**
- Much of perioperative antibiotic use is not driven by high-quality evidence
- Comprehensive perioperative antimicrobial stewardship programs
- (Periop ASPs) appear to be in their infancy in published literature
- and consensus guidelines appear nonexistent at this time
- **I'll be drawing from both published evidence and personal experience (>10 years practicing in this space)**
  → "Tips" and "Best Practices" in this presentation are my personal recommendations for Periop ASPs

Reference: JAMA. 2023;329: 244-252.

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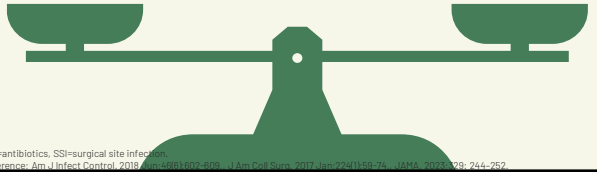
Perioperative antimicrobial stewardship - striking the balance

SSI - morbidity, repeat surgery, healthcare utilization, disability, $$$

Perioperative abx - antibiotic toxicities, resistance, C.diff, $



Abx=antibiotics, SSI=surgical site infection
Reference: Am J Infect Control. 2018;46(6):602-609. J Am Coll Surg. 2017 Jan;224(1):59-74. JAMA. 2023;329: 244-252.

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How I got started with perioperative antimicrobial stewardship

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Data: start here

SSIs have CMS reimbursement and accreditation implications for hospitals
- HACRP
- HRRP
- TJC
- Also- ACS NSQIP, etc.

CDC/NHSN surgical wound classifications

Prophylactic abx apply:
- Clean
- Clean-Contaminated

Prophylactic abx N/A:
- Contaminated
- Dirty/Infected

Monitored major surgeries
- THA/TKA
- Cardiac procedures
- Hysterectomy
- Colon procedures
- Spine procedures
- Hip fracture procedures, Others

CDC/NHSN SSI classifications and surveillance periods
- Incisional
  - Superficial - 30 d
  - Deep - 30-90 d
- Organ/space
  - 30-90 d

Abx=antibiotics, ACS NSQIP=American college of Surgeons national surgery quality improvement program, CDC=centers for disease control and prevention, CMS=Centers for Medicare and Medicaid Services, d=days, HACRP=hospital-acquired conditions reduction program, HRRP=hospital readmission reduction program, N/A=not applicable, NHSN=national healthcare safety network, SSI=surgical site infection, THA/TKA=total hip/knee arthroplasty, TJC=The Joint Commission. References: https://mmshub.cms.gov/about-quality/quality-at-CMS/quality-programs, JAMA. 2023;329:244-252

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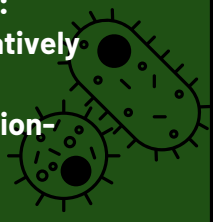
Recommended Best Practice: Pharmacists should collaboratively review every SSI case for antibiotic- and other medication-related opportunities



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Key major clean procedures

Open Heart Procedures CABG, MVR, AVR	Total Joint Arthroplasty THA, TKA, Others
• Common, disease-modifying/life-saving • Inherently higher SSI risk • Severe consequences of sternal wound and/or cardiac infection	• High-volume elective • Very high success rates, improved QoL • Rare, catastrophic risk of PJI

AVR/MVR=atrial/mitral valve replacement/repair, CABG=coronary artery bypass graft, PJI=prosthetic joint infection, QoL=quality of life, SSI=surgical site infection, THA/TKA=total hip/knee arthroplasty. References: J Thorac Cardiovasc Surg. 2016;152: 962-972., N Engl J Med. 2023;388: 251-262, AAOS Guidelines https://www.aaos.org/pijcpg

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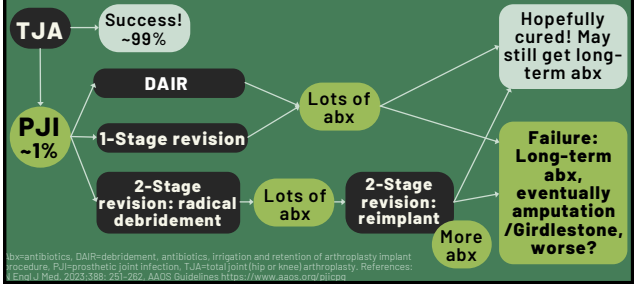
Why is PJI such a big deal?



Abx=antibiotics, DAIR=debridement, antibiotics, irrigation and retention of arthroplasty implant procedure. PJI=prosthetic joint infection, TJA=total joint (hip or knee) arthroplasty. References: N Engl J Med. 2023;388: 251-262, AAOS Guidelines https://www.aaos.org/pijcpg

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Polling Question: Which resource(s) are you relying on most heavily to guide your periop antibiotic recommendations at this time? Pick any that apply-

A: 2013 IDSA/ASHP/SIS/SHEA Guidelines for Antimicrobial Prophylaxis in Surgery

B: 2016-2017 Guidelines for SSI Prevention from WHO, CDC

C: Surgery- or Society-specific guidelines

D: Primary research/studies since guidelines are limited

E: Many/multiple resources (I might be overwhelmed!)

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So many guidelines informing periop abx use...

IDSA/ASHP/SIS/SHEA 2013 Guidelines for Antimicrobial Prophylaxis in Surgery	2016 WHO Global Guidelines for Prevention of SSI	Surgery-, society- or infection-specific guidelines, other international SSI prevention guidelines...
2016 ACS/SIS SSI Infection Guidelines	2017 CDC Guidelines for Prevention of SSI	

ACS=American College of Surgeons, ASHP=American Society of Health-System Pharmacists, CDC=Centers for Disease Control and Prevention, SHEA=Society for Healthcare Epidemiology of America, SIS=Surgical Infection Society, SSI=surgical site infection, WHO=World Health Organization. Reference: Am J Infect Control. 2018 Jun;46(6):602-609., J Am Coll Surg. 2017 Jan;224(1):59-74., WHO guidelines and resources: https://www.who.int/teams/integrated-health-services/infection-prevention-control/surgical-site-infection, Am J Health Syst Pharm. 2013;70: 195-283

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Tip:
Don't just use these (what WE may like/care most about) - Make sure you know what the surgeons are reading/referencing (what THEY care most about) and integrate!

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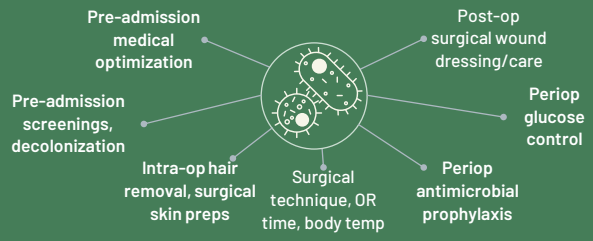
SSI mitigation is multimodal, interprofessional, and longitudinal



OR=operating room; SSI=surgical site infection. Reference: JAMA. 2023;329:244-252. Am J Infect Control. 2018 Jun;46(6):602-609.

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Tip:
Today we'll focus on perioperative antibiotic use and stewardship, but pharmacists can help reduce SSIs in many ways!

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Polling Question: A 62yom weighing 102 kg with PMH of OA, DM2, and obesity presents for elective primary TKA. Pre-admission *S. aureus* nasal culture +MSSA. Allergy to "penicillins" (rash). Which pre-op antibiotic regimen is he currently most likely to receive at your institution?

A: Cefazolin 1000 mg
B: Cefazolin 2000 mg
C: Clindamycin 900 mg
D: Vancomycin 1000 mg
E: Vancomycin 2000 mg

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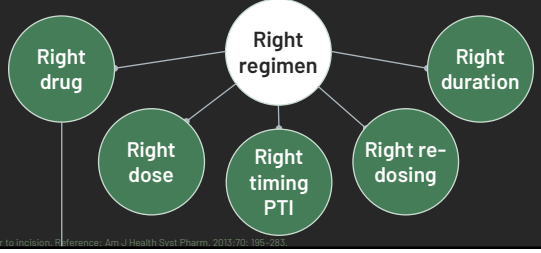
Optimizing (systemic) prophylactic antibiotics in surgery



PTI=prior to incision. Reference: Am J Health Syst Pharm. 2013;70:195-283.

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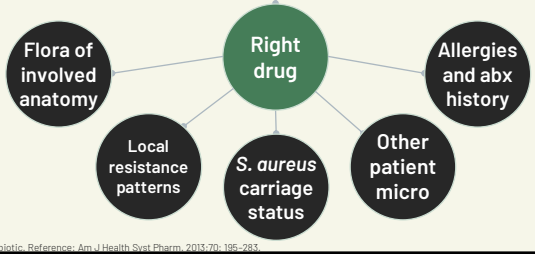
Prophylactic antibiotic selection



Abx=antibiotic. Reference: Am J Health Syst Pharm. 2013;70:195-283.

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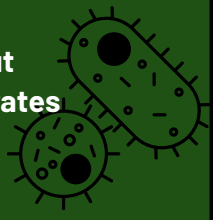
Tip:
Optimizing preop antibiotic prescribing is challenging, but high-yield for improving SSI rates (and for making friends!)



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Right drug: normal flora and other SSI pathogens by procedure

Skin flora - stop here for clean procedures (ortho, neuro, podiatry, CTS, breast): *S. aureus*, coagulase-negative staphylococci, streptococci

- Head/neck: polymicrobial, *peptostreptococcus*
- Shoulder arthroplasty: *C. acnes*
- Gastroduodenal, hepatobiliary: enteric GNB, less of- *Bacteroides* spp., enterococci
- CRS, SOT: as for upper GI, anaerobes more frequent
- Hysterectomy: polymicrobial including GPCs, enteric GNB, *Bacteroides* spp.
- Uro/gyn (if in urinary tract): enteric GNB, if penile prosthesis - plus *pseudomonas, candida*

CRS=colorectal surgery, CTS=cardiothoracic surgery, GNB=gram negative bacilli, GPC=gram positive cocci, SOT=solid organ transplant, SSI=surgical site infection. Reference: Am J Health Syst Pharm. 2013-70: 195-283. J Surg Med. 2017 Mar;1(4):425-463.

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Common pitfalls in pre-op abx ordering

- When cefazolin monotherapy isn't sufficient for the procedure
- When cefazolin monotherapy is sufficient, but clindamycin and vancomycin are not
- Minimally invasive procedures - prophylactic abx may not be indicated

Abx=antibiotic. Reference: Am J Health Syst Pharm. 2013-70: 195-283. . J Trauma Acute Care Surg. 2016 Oct;81(4):765-74.

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Right drug: consider local resistance patterns

- Local antibiograms
- Local SSI pathogen history from case reviews
- Local *S. aureus* colonization data

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Example from my practice:
Local *S. aureus* resistance to clindamycin evident in antibiogram data and in previous TJA SSIs

	MSSA	MRSA
Cefazolin	100%	0%
Clindamycin	74%	58%
Vancomycin	100%	100%

MRSA/MSSA=methacillin-resistant/sensitive *S. aureus*, SSI=surgical site infection, TJA=total joint arthroplasty (hip/knee)

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Example from my practice: Local *S. aureus* resistance to clindamycin evident in antibiogram data and in previous TJA SSIs

S. aureus Colonization	Pre-op Antibiotic	SSI Pathogen	SSI Pathogen Susceptibility to Clindamycin
Unknown	Clindamycin	MRSA	Resistant
Unknown	Cefazolin	MSSA	Resistant
Unknown	Cefazolin + gentamicin	MSSA	Susceptible
Unknown	Clindamycin + gentamicin	MRSA	Resistant
Unknown	Cefazolin	MRSA	Susceptible

MRSA/MSSA=methacillin-resistant/sensitive *S. aureus*, SSI=surgical site infection, TJA=total joint arthroplasty (hip/knee)

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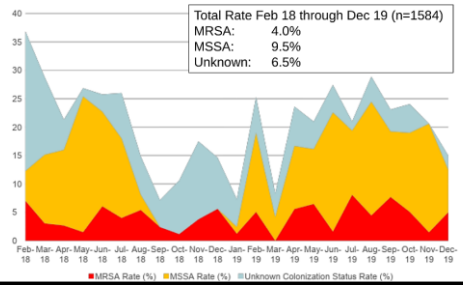
Example from my practice: Pre-op *S. aureus* screening data for TJA population



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Right drug: Pre-op *S. aureus* screening and decolonization

- ☐ Who to screen?
- ☐ Which test(s) to use?
- ☐ Who orders and when?
- ☐ Targeted vs. universal decolonization?
- ☐ Who reviews and alters pre-op abx orders?

Abx=antibiotic. JAMA. 2023;329: 244-252., Am J Infect Control. 2018 Jun;46(6):602-609., J Am Coll Surg. 2017 Jan;224(1):59-74., Am J Health Syst Pharm. 2013;70: 195-283., Curr Infect Dis Rep. 2018;20: 26.

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Pre-op *S. aureus* screening, decolonization, targeted prophylaxis

	OR (95%CI) for GPC SSI	OR (95%CI) for MRSA SSI	OR (95%CI) for MSSA SSI
Decolonization n=1730	0.41 (0.30-0.55)	0.30 (0.15-0.62)	0.50 (0.37-0.69)
Glycopeptide prophylaxis n=8350	0.70 (0.47-1.04)	0.40 (0.20-0.80)	1.47 (0.91-2.38)
Decolonization + targeted ppx n=1129	0.41 (0.30-0.56)	0.22 (0.12-0.38)	0.45 (0.26-0.78)

GPC=gram positive cocci, OR=odds ratio, Ppx=prophylaxis, SSI=surgical site infection. Reference: BMJ. 2013 Jun 17;346:f2743.

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Right drug: Pre-op *S. aureus* screening and decolonization

- ☑ Who to screen? - high-risk procedures, esp. TJA, CTS
- ☑ Which test(s) to use? - consider culture if have time vs. PCR
- ☑ Who orders and when? - surgeon office, PAT?
- ☑ Targeted vs. universal decolonization? - targeted please!
- ☑ Who reviews and alters pre-op abx orders?? - pharmacists!

Abx=antibiotic. JAMA. 2023;329: 244-252., Am J Infect Control. 2018 Jun;46(6):602-609., J Am Coll Surg. 2017 Jan;224(1):59-74., Am J Health Syst Pharm. 2013;70: 195-283., Curr Infect Dis Rep. 2018;20: 26.

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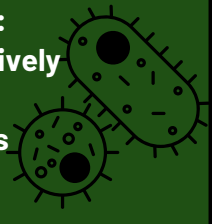
Recommended Best Practice: Pharmacists should prospectively review and optimize all preoperative antibiotic orders



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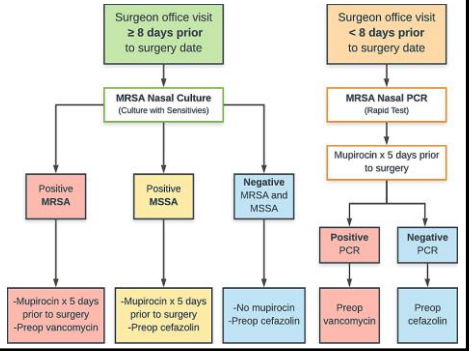
Example from my practice: Pre-op *S. aureus* screening protocol for major clean procedures



MRSA/MSSA=methacillin-resistant/sensitive *S. aureus*, PCR=polymerase chain reaction. Reference: used with permission from J Am Acad Orthop Surg. 2022;30: e1327-e1336.

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Right drug: Other patient-specific micro history

- Asymptomatic bacteruria - important to screen and treat before urologic procedures, important NOT to otherwise
- Revision TJA - tailor pre-op abx to prior PJI pathogen?
- Other patients with history of SSI at site of present surgery? e.g. graft infections

PJI=prosthetic joint infedction,, SSI=surgical site infection, TJA=total joint arthroplasty (ihp/knee). Reference: Clin Infect Dis. 2019;68: 611-1615., Clin Infect Dis. 2017;64: 806-809.,

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Right drug: Allergy assessment

- ☐ Are allergies effectively evaluated at pre-op abx ordering?
- ☐ Best penicillin delabeling strategy for periop?
- ☐ Improved history-taking: who, when, how?
- ☐ Pre-op allergist referral?
- ☐ Augmenting/suppressing allergy warnings?
- ☐ Again, who reviews and alters pre-op abx orders??

Abx=antibiotic. Reference: Infect Control Hosp Epidemiol. 2022;43: 829-833., J Am Acad Orthop Surg. 2023;31: e107-e117., J Arthroplasty. 2017;32: S101-S108., Clin Orthop Relat Res. 2016;474: 1601-1606., Clin Infect Dis. 2018;66: 329-336., Clin Infect Dis. 2021;72: 1404-1412., Hosp Epidemiol. 2022;43: 829-833

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Penicillin allergy labels mediate increased SSI risk

11%	↓ 80%	↑ OR 1.51
Penicillin allergy label	→ Lower utilization of first-line pre-op abx	→ SSI rate increased

Abx=antibiotic, SSI=surgical site infection. Reference: Clin Infect Dis. 2019 Jun 19;69(1):329-336.

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Pharmacist-led pre-op allergy assessment

Pharmacist performed β-lactam allergy clarification telephone interviews before elective surgeries and treatment algorithm	→ ↑ β-lactam usage ↔ AEs ↓ SSIs
Pharmacist-led pre-op abx selection algorithm and QI project in surgical patients with PCN allergy label	→ ↑ β-lactam usage ↔ AEs ↓ Med costs
Pre-admission structured allergy histories by pharmacists on patients with β-lactam allergy undergoing elective surgeries	→ ↓ Second-line pre-op abx decrease linked to rate of interventions

Abx=antibiotics, AMS=antimicrobial stewardship, SSI=surgical site infection. Ref: Am J Health Syst Pharm. 2021;78: S76-S82., Am J Health Syst Pharm. 2023, doi:10.1093/ajhp/zxad023., J Antimicrob Chemother. 2017;72: 2657-2660.

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Recommended Best Practice: Perioperative antimicrobial stewardship efforts should make increasing use of first-line pre-op antibiotics to improve patient and institutional outcomes a top priority

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Putting it all together: Optimizing pre-op antibiotic selection

- Pre-op antibiotic protocols/order sets
- Workflow optimization
- Provider and staff education
- Surveillance and quality improvement

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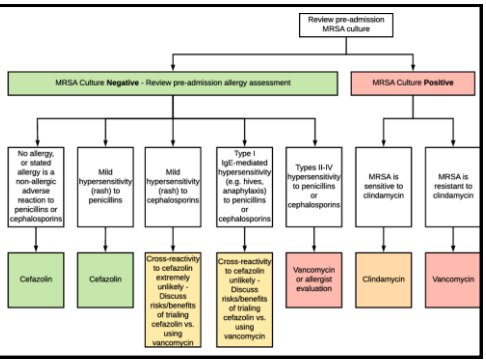
Example from my practice: Pre-op antibiotic selection protocol for major clean procedures



MRSA/MSSA=methicillin-resistant/sensitive *S. aureus*.
Reference: used with permission from J Am Acad Orthop Surg. 2022;30: e1327-e1336.

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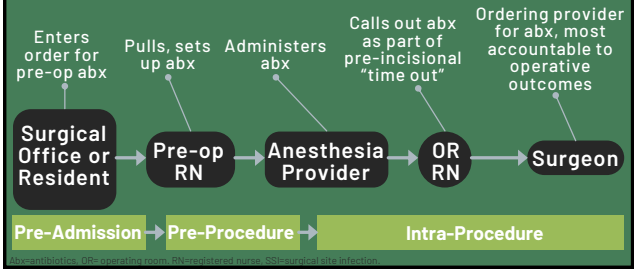
Understanding the unique workflow and educational needs of periop



Abx=antibiotics, OR=operating room, RN=registered nurse, SSI=surgical site infection.

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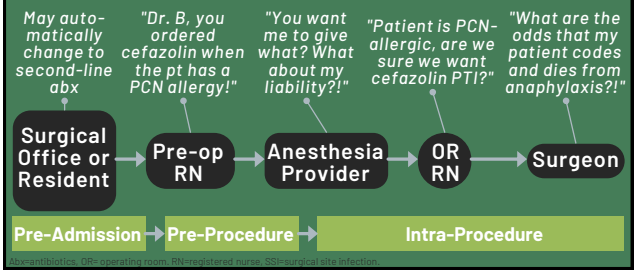
Understanding the unique workflow and educational needs of periop



Abx=antibiotics, OR=operating room, RN=registered nurse, SSI=surgical site infection.

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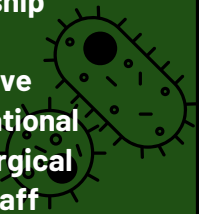
Recommended Best Practice: Periop antimicrobial stewardship programs should only be implemented after collaborative development and broad educational interventions spanning the surgical continuum of providers and staff



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Example from my practice: Collaborative, comprehensive periop ASP for TJA

Ortho ASP Lead
Led and coordinated initiative, maintained SSI case series and project dashboard (Orthopedic Clinical Pharmacist)

Interprofessional Team
-Orthopedic Surgeons and APPs
-ID Physician and Pharmacist
-Medical Physicians and APPs
-Perioperative Nurses
-Perioperative Leadership
-Quality Department
-Pre-admission Testing

ASP Work Team – Reviewed literature and generated recommendations

Ortho Quality Committee – Discussed and approved proposed changes

Change Team – Operationalized and implemented approved process changes

- **12 Total Recommendations Issued**
- **11 Accepted Changes**
- **3 Grouped Implementations**

APP=advanced practice practitioner, ASP=antimicrobial stewardship program, SSI=surgical site infection.
Reference: used with permission from J Am Acad Orthop Surg. 2022;30: e1327-e1336.

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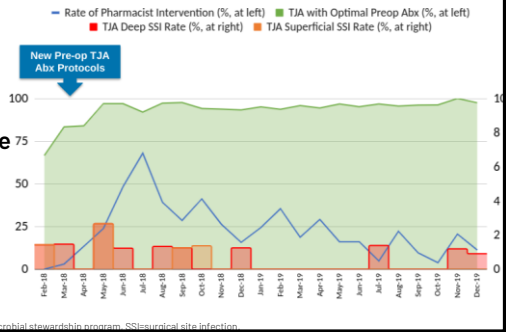
Example from my practice: Ortho ASP dashboard for surveillance



Abx=antibiotics, ASP=antimicrobial stewardship program, SSI=surgical site infection.

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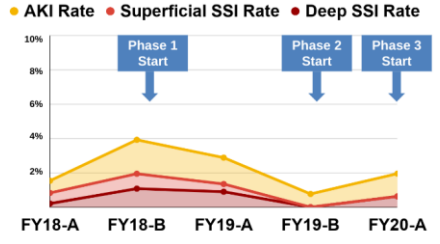
Example from my practice: Quality improvement report for Ortho ASP



Outcome	7/17 – 12/17	1/18 – 6/18	7/18 – 12/18	1/19 – 6/19	7/19 – 12/19
AKI	0.71%	1.98%	1.54%	0.77%	1.33%
Superficial SSI	0.62%	0.87%	0.45%	0.00%	0.00%
Deep SSI	0.21%	1.08%	0.9%	0.00%	0.63%

FY=fiscal year (A indicates first 6 months, B indicates second 6 months), ASP=antimicrobial stewardship program, SSI=surgical site infection. Reference: used with permission from J Am Acad Orthop Surg. 2022;30: e1327-e1336.

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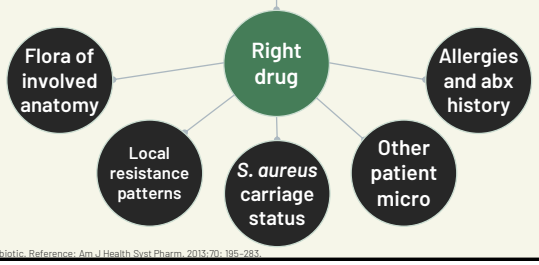
Prophylactic antibiotic selection



Abx=antibiotic. Reference: Am J Health Syst Pharm. 2013;70: 195-283.

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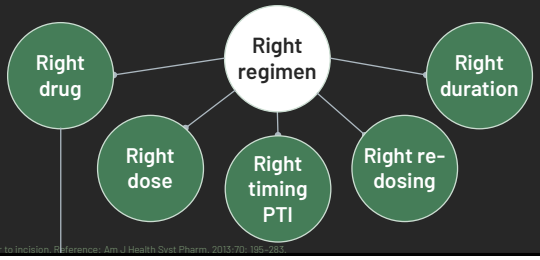
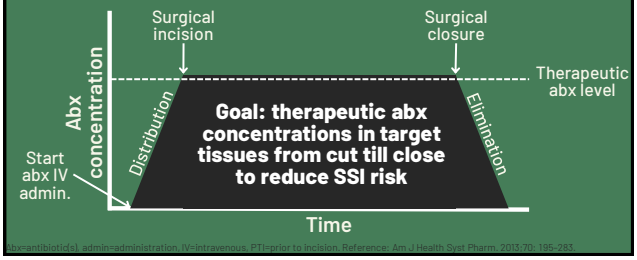
Optimizing (systemic) prophylactic antibiotics in surgery



PTI=prior to incision. Reference: Am J Health Syst Pharm. 2013;70: 195-283.

45

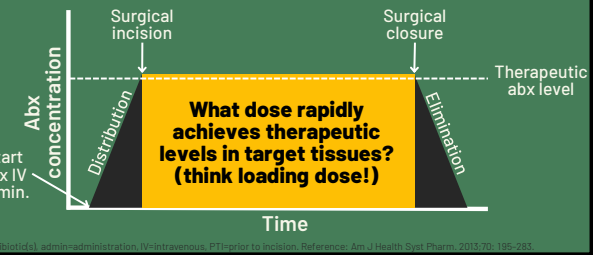
Right dose/timing PTI/redosing: understanding kinetics



Abx=antibiotic(s), admin=administration, IV=intravenous, PTI=prior to incision. Reference: Am J Health Syst Pharm. 2013;70: 195-283.

46

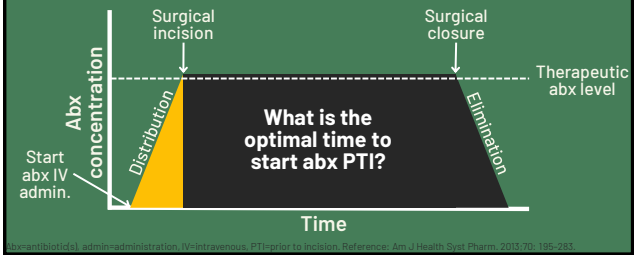
Right dose/timing PTI/redosing: understanding kinetics



Abx=antibiotic(s), admin=administration, IV=intravenous, PTI=prior to incision. Reference: Am J Health Syst Pharm. 2013;70: 195-283.

47

Right dose/timing PTI/redosing: understanding kinetics



Abx=antibiotic(s), admin=administration, IV=intravenous, PTI=prior to incision. Reference: Am J Health Syst Pharm. 2013;70: 195-283.

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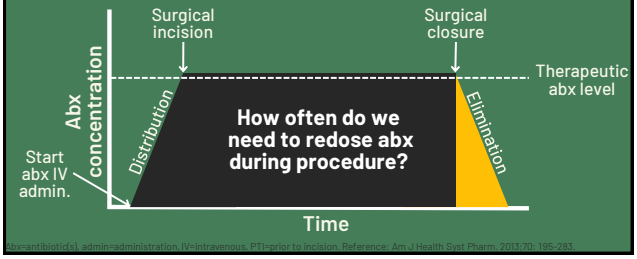
Right dose/timing PTI/redosing: understanding kinetics



Abx=antibiotic(s), admin=administration, IV=intravenous, PTI=prior to incision. Reference: Am J Health Syst Pharm. 2013;70: 195-283.

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Cefazolin vs. alternatives - no contest for ideal pre-op antibiotic!

Cefazolin	Clindamycin/Vancomycin
☑	☐
☑	☑
☑	☐
☑	☑
☑	☐
☑	☐
☑	☐

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Optimizing pre-op abx regimens

Science		Engineering
Right drug and dose	→	Pre-op abx order sets, protocols
Right timing PTI	→	Pre-op to OR workflow mapping/process
Right intra-op redosing	→	OR RN room resource
SSI case reviews, QI	→	Institutional guidance document

Abx=antibiotics, OR=operating room, PTI=prior to incision, QI=quality improvement, RN=registered nurse

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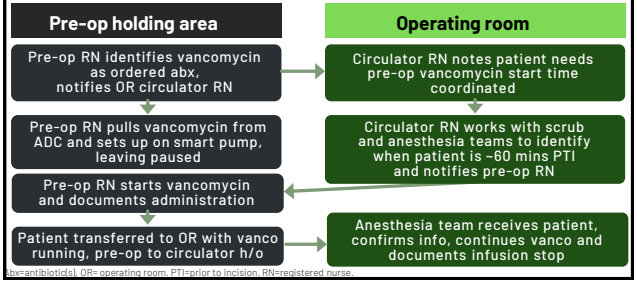
Example from my practice: Periop workflow /process mapping for pre-op vancomycin



Abx=antibiotic(s), OR= operating room, PTI=prior to incision, RN=registered nurse.

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Example from my practice:

Intra-op redosing OR resource - laminated copy on every OR white board, used by OR circulator RN

	Start intra-op dose at this time after start of pre-op dose
Cefazolin	4 hours*
Clindamycin	6 hours*
Vancomycin	None needed
Cefotetan	6 hours*
Gentamicin	None needed
Metronidazole	None needed
*also give redose if/when 1500 mL EBL	

EBL=estimated blood loss, OR=operating room, RN=registered nurse. Reference: Am J Health Syst Pharm. 2013;70: 195-283.,

55

Example from my practice: Guidance document for periop abx timing for QI purposes

Pre-op Abx	Recommended Start Time PTI	Recommended Redosing Interval
Cefazolin	5-60 min	4 hr
Clindamycin	15-120 min	6 hr
Vancomycin	15-60 min	Not indicated
Cefotetan	15-60 min	6 hr
Gentamicin	15-120 min	Not applicable
Metronidazole	30-120 min	Not indicated

Abx=antibiotic(s), IVP=intravenous push, PTI=prior to incision, QI=quality improvement. Reference: Am J Health Syst Pharm. 2013;70: 195-283., Ann Surg. 2009;250: 10-16., Medicine (Baltimore). 2017;96: e6903., Antimicrob Agents Chemother. 2002;46: 3026-3030., JAMA. 1980;244: 1353-1354., Iin Orthop Relat Res. 2011;469: 3486-3494., J Antimicrob Chemother. 2006;58: 645-650.

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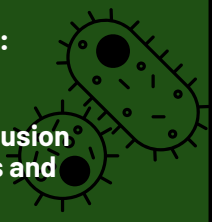
Tip:
When developing pre-op antibiotic protocols and procedures, consideration must be given to:

- **infusion times**
- **necessity of smart pumps**
- **compatibility of abx and infusion apparatus with anesthetics and anesthesia setup**
- **other logistical/human factors**



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Polling Question: Clinical case - A 62yom with NKDA was admitted to your hospital last night with septic shock. He was started on empiric vancomycin 1750 mg q12hr, cefepime 2 g IV q12hr, IV fluids and vasopressors. This morning, he is being rushed to OR for emergent ex-lap with possible subtotal colectomy for suspected ischemic bowel.
The OR RN calls you to ask what pre-op abx they should give PTI, considering the vancomycin was last given 4 hours ago and cefepime 2 hours ago. What would you advise?

A: No additional abx are needed PTI
B: Get an order for cefazolin 2 g IV to give PTI
C: Get an order for cefotetan 2 g IV to give PTI
D: Get an order for metronidazole 500 mg IV to give PTI

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Special circumstances - inpatients already on abx who need surgery

- Goal = ensure abx regimen maintains therapeutic need while also providing sufficient spectrum AND timing for duration of surgical prophylaxis
- Requires patient-specific evaluation, optimization, and communication
  - Consider length of procedure and also if current abx at steady-state yet
  - Ensuring floor doses are given intra-op requires "manual override" of usual processes
- If therapeutic goal is met, no clinical or compliance reason to give additional abx PTI (if documented infection)!

Abx=antibiotic(s), PTI=prior to incision.

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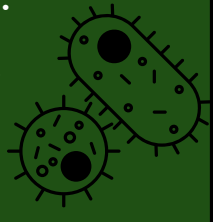
Recommended Best Practice:
Clinical pharmacists should target inpatient surgeries for patient-specific antibiotic optimization interventions



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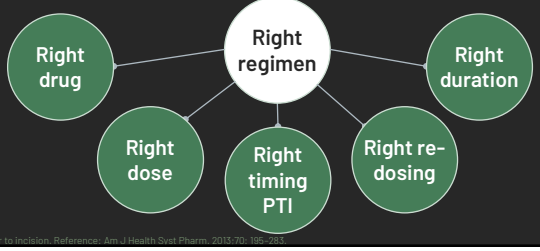
Optimizing (systemic) prophylactic antibiotics in surgery



PTI=prior to incision. Reference: Am J Health Syst Pharm. 2013;70: 195–283.

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Right duration of prophylactic abx in surgery: Not a universal answer, increasingly muddied waters

Probably only until surgical closure for most procedures

Exceptions:
- TJA- all? only revisions?
- Major cardiac procedures
- Breast reconstruction (implant-based)
- Others??

Dirty procedures - different goals (abx aren't prophylactic)

Abx=antibiotic(s), SSI=surgical site infection, TJA=total joint arthroplasty (hip/knee). Reference: JAMA. 2023;329: 244–252., Am J Infect Control. 2018;46: 602–609. , Am J Health Syst Pharm. 2013;70: 195–283. Lancet Infect Dis. 2016;16: e288–e303., JAMA Surg. 2019;154: 590–598., J Knee

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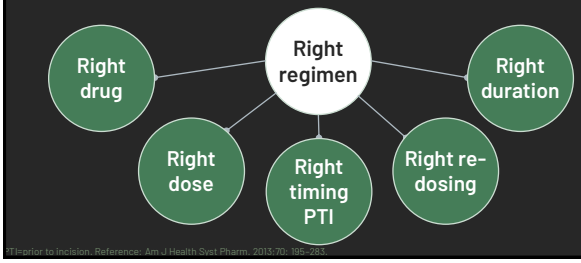
Optimizing (systemic) prophylactic antibiotics in surgery



PTI=prior to incision. Reference: Am J Health Syst Pharm. 2013;70: 195-283.

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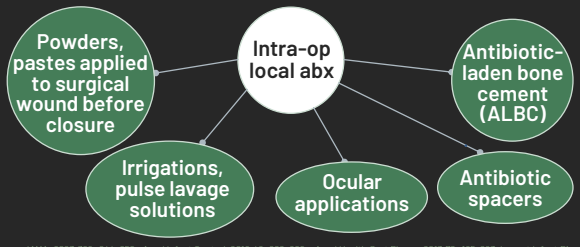
What about all the other antibiotics used in surgery?



Reference: JAMA. 2023;329: 244-252., Am J Infect Control. 2018;46: 602-609. , Am J Health Syst Pharm. 2013;70: 195-283. Lancet Infect Dis. 2016;16: e288-e303., Am J Health Syst Pharm. 2013;70: 195-283., J Am Acad Orthop Surg. 2023 Jan 1;31(1):e1-e8.

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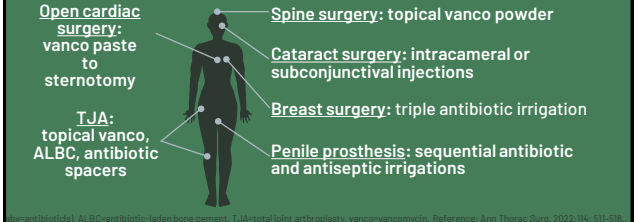
Examples of intra-op local abx use with supporting evidence



Abx=antibiotic(s). ALBC=antibiotic-laden bone cement, TJA=total joint arthroplasty, vanco=vancomycin. Reference: Ann Thorac Surg. 2022;114: 511-518. Orthop Traumatol Surg Res. 2020; 102741. J Orthop Translat. 2020;23: 53-60., J Am Acad Orthop Surg. 2018;26: 727-734., AAOS PJI guidelines https://www.aaos.org/pjicpg. Clin Infect Dis. 2012;55: 1474-1480., Aesthet Surg J. 2022;42: NP102-NP111., BMJ Open. 2022;12: e058697., , J Sex Med.

67

Example periop ASP interventions on local antibiotic use for TJA

- "Avoid adding antibiotic powders to surgical irrigations for all TJA procedures"
- "If topical antibiotics are used intraoperatively, consider vancomycin powder prior to wound closure only"
- "Use only low-dose, commercially-available ALBC per surgeon discretion in primary THA, aseptic revision TJA, and 2nd-stage/reimplant revision TJA procedures"
- "Routine use of ABLC in primary TKA is not recommended but may be considered in select patients"

Abx=antibiotic, ALBC=antibiotic-laden bone cement, THA/TJA/TKA=total hip/joint/knee arthroplasty. Reference: J Am Acad Orthop Surg. 2022;30: e1327-e1336.

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Example periop ASP interventions on local antibiotic use for TJA

- "Adding antibiotic powder to bone cement to compound high-dose ABLC in 1st-stage/spacer revision TJA procedures is appropriate, but consider using vancomycin preferentially for this purpose due to best likely benefit/risk ratio of studied antibiotics. Additionally, postoperative therapeutic drug level monitoring should be considered before further systemic antibiotic dosing to avoid overexposure"

Abx=antibiotic, ALBC=antibiotic-laden bone cement, THA/TJA/TKA=total hip/joint/knee arthroplasty. Reference: J Am Acad Orthop Surg. 2022;30: e1327-e1336.

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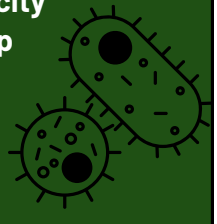
Tip:

Systemic exposure and toxicity can occur from local intra-op antibiotics, especially those loaded into spacers or bone cement during major orthopedic procedures!



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Polling Question: Does your institution have vials of antibiotic powder(s) stocked in your OR automated dispensing cabinets (ADCs)?

A: I have no idea
B: I think so?
C: Yes, vancomycin
D: Yes, vancomycin and tobramycin
E: Yes, tons of them!

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Intra-op local/topical antibiotic use: Opportunities unidentified

- Not "ordered" - no clear order trail, no pharmacist verification
- Surgeon preference cards
- Override ADC to sterile field
- Admixed in OR?
- Allergy warnings?
- "One-step" documentation instead of MAR entries

ADC=automated dispensing cabinet, OR=operating room, MAR=medication administration record

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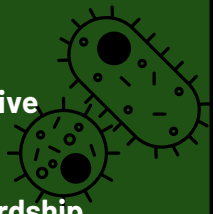
Recommended Best Practice:
Pharmacy technicians and pharmacists should routinely collaborate to surveillance antibiotic stock in perioperative ADCs to identify potential opportunities to optimize medication safety and stewardship



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Closing thoughts – why is perioperative antimicrobial stewardship so hard?

- Many targets spanning phases of care
- Complex orchestra of players and processes
- Collaboration is essential, but can be challenging
- Need patient outcomes data, not just med use
- Need to pay for it
- Incremental wins

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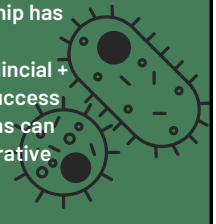
Summary and Discussion

- Perioperative antimicrobial stewardship has unique challenges
  - Collaboration and integration of clincial + operational aspects are keys to success
- Pharmacists and pharmacy technicians can play active roles in improving perioperative antibiotic use to improve patient and institutional outcomes



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Perioperative Antimicrobial Stewardship and Pharmacy's Role

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To receive CE credit:

Log back onto the Premier CPE website (https://ce.pharmacy.premierinc.com) and complete:

1) the post-test, and

2) the program evaluation.

Participants have up to 45 days after the CPE event to complete this information to get CPE credit.

For any questions, contact **pharmacyteam@premierinc.com**.

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Topic	CDC Guideline for Prevention of SSI, 2017	ACS/SIS: Surgical Site Infection Guidelines, 2016 Update	WHO Global Guidelines on SSI Prevention, WHO Recommendations on Intra/Postop SSI Prevention- 2016	IDSA/SIS/ASHP/SHEA Guidelines for AMP in Surgery, 2013
Pre-operative staph aureus screening and decolonization; use of pre-op vancomycin	Did not directly address	Implementation of MRSA screening and decolonization should depend on baseline SSI and MRSA rates Screening and decolonization is recommended for patients undergoing total joint replacement and cardiac procedures ● No standard decolonization protocol supported by literature Vancomycin should not be administered as prophylaxis to MRSA-negative patients	Patients undergoing cardiothoracic or orthopedic surgery with **known** nasal carriage of *S. aureus* should receive perioperative intranasal applications of mupirocin 2% ointment with or without chlorhexidine body wash **(strong recommendation, moderate quality of evidence)** ● No recommendations on frequency or duration of mupirocin administration The panel suggests *considering* treating patients with known nasal carriage of *S. aureus* undergoing other types of surgery with intranasal mupirocin 2% with or without chlorhexidine body wash **(conditional recommendation, moderate quality of evidence)** ● Take into account local rates of *S. aureus* and MRSA, and patient-specific factors (past *S. aureus* infection, known carrier of CA-MRSA, or colonized by *S. aureus* in sites other than the nose ***Screening** for* S. aureus *was not assessed as part of the intervention so no recommendations can be made*	Vancomycin prophylaxis should be considered in patients with known MRSA colonization or at high risk for MRSA colonization in the absence of surveillance data. In institutions with SSIs attributed to CA-MRSA, other antimicrobial agents with activity against MRSA should be considered. Screening for both MSSA and MRSA colonization is recommended to help identify candidates for decolonization and to assist in the selection of optimal antibiotic therapy. Decolonization with intranasal application of 2% mupirocin is recommended in many patients colonized with *S. aureus*, especially those undergoing cardiac and orthopedic surgeries.

			No recommendations about which antibiotics to use or dosing were made	
Topic	**CDC Guideline for Prevention of SSI, 2017**	**ACS/SIS: Surgical Site Infection Guidelines, 2016 Update**	**WHO Global Guidelines on SSI Prevention, WHO Recommendations on Intra/Postop SSI Prevention- 2016**	**IDSA/SIS/ASHP/SHEA Guidelines for AMP in Surgery, 2013**
Duration of antimicrobial prophylaxis (AMP)	In <u>clean and clean-contaminated procedures</u>, do not administer additional prophylactic antimicrobial agent doses after the surgical incision is closed in the operating room, even in the presence of a drain. (**Category IA–strong recommendation; high-quality evidence**.) The available data examined the following comparisons for different postoperative AMP durations: 1. All surgeries—No post-op AMP vs. ≤24 hours 2. Cardiac a. No post-op AMP vs. ≤24 hours b. No post-op AMP vs. <96 hours c. No post-op AMP vs. 72–96 hours d. ≤24 vs. 72 hours	Antibiotics should be discontinued at time of incision closure, with the exception of; ● Implant-based breast reconstruction ○ 24-48hrs ● Joint arthroplasty ○ 24hrs ● Cardiac procedures ○ 48hrs *In general, there is no evidence that antibiotic administration after incision closure decreases SSI risk across a range of procedures, including <u>clean</u>, <u>clean-contaminated, and contaminated</u> wound classes.*	The panel recommends against the prolongation of surgical antibiotic prophylaxis (SAP) administration after completion of the operation for the purpose of preventing SSIs (**strong recommendation, moderate quality of evidence**) Meta-analysis showed continuation might be beneficial in ● Cardiac (OR= 0.43; 0.25 – 0.76) ● Orthognathic (OR= 0.3; 0.1 – 0.88) ***Considering the low quality of the evidence and the results of the overall meta-analysis (moderate quality), the expert panel decided to strongly recommend against SAP prolongation, also because of the widespread risk of antimicrobial resistance.* The panel suggests not continuing perioperative antibiotic prophylaxis because of the presence of a wound drain **(conditional recommendation, low quality of evidence).** *Seven RCTs were identified. The meta-analysis showed that prolonged antibiotic prophylaxis in the presence of a wound*	Post-operative antimicrobial administration is not recommended for most cases, and the duration of antimicrobial prophylaxis should be less than 24 hours for most procedures. A prophylaxis duration of up to 48 hours has been accepted for cardiothoracic procedures (**expert panel consensus**) Several studies have shown that extended use of antimicrobial prophylaxis (>48 hours) fails to reduce the risk of SSI and leads to antimicrobial resistance to selected antibiotics

	3. Thoracic—No post-op AMP vs. 2 days		*drain has no benefit in reducing SSI compared with perioperative prophylaxis alone (OR 0.79; 95% CI 0.53–1.20).*	
Topic	**CDC Guideline for Prevention of SSI, 2017**	**ACS/SIS: Surgical Site Infection Guidelines, 2016 Update**	**WHO Global Guidelines on SSI Prevention, WHO Recommendations on Intra/Postop SSI Prevention- 2016**	**IDSA/SIS/ASHP/SHEA Guidelines for AMP in Surgery, 2013**
Intra-operative topical/local antibiotic use	No recommendation regarding antimicrobial irrigation for the prevention of SSI was made. Topical antimicrobial agents should not be applied to the surgical incision for the prevention of SSI (Category 1B – strong recommendation, low quality evidence)	Topical antibiotics can reduce SSI for specific cases, including spine surgery, total joint arthroplasty, and cataract surgery, but there is insufficient evidence to recommend routine use at this time.	The panel considers that there is insufficient evidence to recommend for or against **saline** irrigation of incisional wounds before closure for the purpose of preventing SSI The panel suggests considering the use of irrigation of the incisional wound with an **aqueous povidone-iodine (PVP-I)** solution before closure for the purpose of preventing SSI, particularly in clean and clean-contaminated wounds The panel suggests that **antibiotic** incisional wound irrigation before closure should not be used for the purpose of preventing SSI. (Conditional recommendation, low quality of evidence) ● Evidence from 5 RCTs shows that the antibiotic irrigation of the incisional wound has neither benefit nor harm in reducing SSI when compared to no irrigation or to saline irrigation.	Routine use of topical antimicrobials is not recommended. ● Prophylactic topical administration of antimicrobials in the surgical incision is superior to placebo but not to parenteral administration, and it does not increase the efficacy of parenteral antimicrobials when used in combination. ● Limited high quality data assessing safety and efficacy is available

Perioperative Antimicrobial Stewardship
4/4/23
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Resources and References

CMS Quality Programs - https://mmshub.cms.gov/about-quality/quality-at-CMS/quality-programs
TJC SSI Info - https://www.jointcommission.org/resources/patient-safety-topics/infection-prevention-and-control/surgical-site-infections/
NSQIP - https://www.facs.org/quality-programs/data-and-registries/acs-nsqip/
CDC/NHSN SSI Definitions - https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf

Sternal wound infection prevention guidance - [1]

Recent PJI reviews and guidelines - [2–4]

Guidelines informing general SSI prevention and surgical antimicrobial prophylaxis - [5–9], also WHO book/resources available- https://www.who.int/teams/integrated-health-services/infection-prevention-control/surgical-site-infection

Recent SSI prevention review - [10]

Presumptive antibiotics in trauma - [11]

Pre-op *S. aureus* screening and decolonization (select pieces, see SSI guidelines and reviews too): [1,12–17]

Pre-op asymptomatic bacteriuria: [18–21]

Periop PCN allergy delabeling/increasing use of first-line abx: [22–42]

PK deep dive into optimal start time of pre-op abx PTI (in addition to review contained in 2013 guidelines above): [43–64]

Postop abx: [65–75]

Bone cement/spacer abx (select examples): [76–88]
Other loca/topical intra-op abx (select examples): [89–96]

Comprehensive ortho surgery ASP I lead: [97]
Other periop ASPs: [98–101]
Periop clinical pharmacy practice: [102]

Reference List:

1. Lazar HL, Salm TV, Engelman R, Orgill D, Gordon S. Prevention and management of sternal wound infections. J Thorac Cardiovasc Surg. 2016;152: 962–972. doi:10.1016/j.jtcvs.2016.01.060

2. Patel R. Periprosthetic Joint Infection. N Engl J Med. 2023;388: 251–262. doi:10.1056/NEJMra2203477

3. Ricciardi BF, Muthukrishnan G, Masters EA, Kaplan N, Daiss JL, Schwarz EM. New developments and future challenges in prevention, diagnosis, and treatment of prosthetic joint infection. J Orthop Res. 2020;38: 1423–1435. doi:10.1002/jor.24595

4. American Academy of Orthopaedic Surgeons Evidence-Based Clinical Practice Guideline for Diagnosis and Prevention of Periprosthetic Joint Infections. Published March 11 2019 [cited 15 Feb 2023]. Available: https://www.aaos.org/pjicpg

5. O'Hara LM, Thom KA, Preas MA. Update to the Centers for Disease Control and Prevention and the Healthcare Infection Control Practices Advisory Committee Guideline for the Prevention of Surgical Site Infection (2017): A summary, review, and strategies for implementation. Am J Infect Control. 2018;46: 602–609. doi:10.1016/j.ajic.2018.01.018

6. Ban KA, Minei JP, Laronga C, Harbrecht BG, Jensen EH, Fry DE, et al. American college of surgeons and surgical infection society: Surgical site infection guidelines, 2016 update. J Am Coll Surg. 2017;224: 59–74. doi:10.1016/j.jamcollsurg.2016.10.029

7. Allegranzi B, Bischoff P, de Jonge S, Kubilay NZ, Zayed B, Gomes SM, et al. New WHO recommendations on preoperative measures for surgical site infection prevention: an evidence-based global perspective. Lancet Infect Dis. 2016;16: e276–e287. doi:10.1016/S1473-3099(16)30398-X

8. Allegranzi B, Zayed B, Bischoff P, Kubilay NZ, de Jonge S, de Vries F, et al. New WHO recommendations on intraoperative and postoperative measures for surgical site infection prevention: an evidence-based global perspective. Lancet Infect Dis. 2016;16: e288–e303. doi:10.1016/S1473-3099(16)30402-9

9. Bratzler DW, Dellinger EP, Olsen KM, Perl TM, Auwaerter PG, Bolon MK, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. Am J Health Syst Pharm. 2013;70: 195–283. doi:10.2146/ajhp120568

10. Seidelman JL, Mantyh CR, Anderson DJ. Surgical site infection prevention: A review. JAMA. 2023;329: 244–252. doi:10.1001/jama.2022.24075

11. Hopkins TL, Daley MJ, Rose DT, Jaso TC, Brown CVR. Presumptive antibiotic therapy for civilian trauma injuries. J Trauma Acute Care Surg. 2016;81: 765–774. doi:10.1097/TA.0000000000001164

12. Ribau AI, Collins JE, Chen AF, Sousa RJ. Is Preoperative Staphylococcus aureus Screening and Decolonization Effective at Reducing Surgical Site Infection in Patients Undergoing Orthopedic Surgery? A Systematic Review and Meta-Analysis With a Special Focus on Elective Total Joint Arthroplasty. J Arthroplasty. 2021;36: 752–766.e6. doi:10.1016/j.arth.2020.08.014

13. San-Juan R, Gotor-Pérez CA, López-Medrano F, Fernández-Ruiz M, Lora D, Lizasoain M, et al. Eradication of Staphylococcus aureus Post-Sternotomy Mediastinitis Following the Implementation of Universal Preoperative Nasal Decontamination With Mupirocin: An Interrupted Time-Series Analysis. Clin Infect Dis. 2021;73: 1685–1692. doi:10.1093/cid/ciab073

14. Saraswat MK, Magruder JT, Crawford TC, Gardner JM, Duquaine D, Sussman MS, et al. Preoperative Staphylococcus Aureus Screening and Targeted Decolonization in Cardiac Surgery. Ann Thorac Surg. 2017;104: 1349–1356. doi:10.1016/j.athoracsur.2017.03.018

15. Schweizer M, Perencevich E, McDanel J, Carson J, Formanek M, Hafner J, et al. Effectiveness of a bundled intervention of decolonization and prophylaxis to decrease Gram positive surgical site infections after cardiac or orthopedic surgery: systematic review and meta-analysis. BMJ. 2013;346: f2743. doi:10.1136/bmj.f2743

16. Chen AF, Wessel CB, Rao N. Staphylococcus aureus screening and decolonization in orthopaedic surgery and reduction of surgical site infections. Clin Orthop Relat Res. 2013;471: 2383–2399. doi:10.1007/s11999-013-2875-0

17. Madden GR, Sifri CD. Antimicrobial Resistance to Agents Used for Staphylococcus aureus Decolonization: Is There a Reason for Concern? Curr Infect Dis Rep. 2018;20: 26. doi:10.1007/s11908-018-0630-0

18. Nicolle LE, Gupta K, Bradley SF, Colgan R, DeMuri GP, Drekonja D, et al. Clinical practice guideline for the management of asymptomatic bacteriuria: 2019 update by the Infectious Diseases Society of America. Clin Infect Dis. 2019;68: 1611–1615. doi:10.1093/cid/ciz021

19. Lamb MJ, Baillie L, Pajak D, Flynn J, Bansal V, Simor A, et al. Elimination of Screening Urine Cultures Prior to Elective Joint Arthroplasty. Clin Infect Dis. 2017;64: 806–809. doi:10.1093/cid/ciw848

20. Bouvet C, Lübbeke A, Bandi C, Pagani L, Stern R, Hoffmeyer P, et al. Is there any benefit in pre-operative urinary analysis before elective total joint replacement? Bone Joint J. 2014 [cited 10 May 2021]. doi:10.1302/0301-620X.96B3.32620

21. Sousa R, Muñoz-Mahamud E, Quayle J, Dias da Costa L, Casals C, Scott P, et al. Is asymptomatic bacteriuria a risk factor for prosthetic joint infection? Clin Infect Dis. 2014;59: 41–47. doi:10.1093/cid/ciu235

22. Stonerock D, Hallo-Carrasco A, Edwards M, Porter SB, Epps KL, Gonzalez-Estrada A. Pharmacist-led improvement in perioperative antibiotic selection for patients with a penicillin allergy label. Am J Health Syst Pharm. 2023. doi:10.1093/ajhp/zxad023

23. Kwiatkowski S, Mulugeta S, Davis S, Kenney R, Kalus J, Walton L, et al. Optimizing preoperative antibiotics in patients with β-lactam allergies: A role for pharmacy. Am J Health Syst Pharm. 2021;78: S76–S82. doi:10.1093/ajhp/zxab218

24. Vaisman A, McCready J, Hicks S, Powis J. Optimizing preoperative prophylaxis in patients with reported β-lactam allergy: a novel extension of antimicrobial stewardship. J Antimicrob Chemother. 2017;72: 2657–2660. doi:10.1093/jac/dkx171

25. Collins CD, Scheidel C, Anam K, Polega S, Malani AN, Hayward A, et al. Impact of an

Antibiotic Side-Chain-Based Cross-reactivity Chart Combined With Enhanced Allergy Assessment Processes for Surgical Prophylaxis Antimicrobials in Patients With β-Lactam Allergies. Clin Infect Dis. 2021;72: 1404–1412. doi:10.1093/cid/ciaa232

26. Seidelman JL, Moehring RW, Weber DJ, Anderson DJ, Lewis SS. The impact of patient-reported penicillin or cephalosporin allergy on surgical site infections. Infect Control Hosp Epidemiol. 2022;43: 829–833. doi:10.1017/ice.2021.232

27. Kurcz BP, Allan DG, Nestler AJ, Lister EL, Yarnell WC, Delfino KR, et al. Documented penicillin allergies should not preclude use of preoperative cefazolin in hip and knee arthroplasty. J Am Acad Orthop Surg. 2023;31: e107–e117. doi:10.5435/JAAOS-D-22-00122

28. McDanel DL, Azar AE, Dowden AM, Murray-Bainer S, Noiseux NO, Willenborg M, et al. Screening for Beta-Lactam Allergy in Joint Arthroplasty Patients to Improve Surgical Prophylaxis Practice. J Arthroplasty. 2017;32: S101–S108. doi:10.1016/j.arth.2017.01.012

29. Tan TL, Springer BD, Ruder JA, Ruffolo MR, Chen AF. Is vancomycin-only prophylaxis for patients with penicillin allergy associated with increased risk of infection after arthroplasty? Clin Orthop Relat Res. 2016;474: 1601–1606. doi:10.1007/s11999-015-4672-4

30. Wyles CC, Hevesi M, Osmon DR, Park MA, Habermann EB, Lewallen DG, et al. 2019 John Charnley Award: Increased risk of prosthetic joint infection following primary total knee and hip arthroplasty with the use of alternative antibiotics to cefazolin: the value of allergy testing for antibiotic prophylaxis. Bone Joint J. 2019;101-B: 9–15. doi:10.1302/0301-620X.101B6.BJJ-2018-1407.R1

31. Stone AH, Kelmer G, MacDonald JH, Clance MR, King PJ. The Impact of Patient-Reported Penicillin Allergy on Risk for Surgical Site Infection in Total Joint Arthroplasty. J Am Acad Orthop Surg. 2019;27: 854–860. doi:10.5435/JAAOS-D-18-00709

32. Blumenthal KG, Ryan EE, Li Y, Lee H, Kuhlen JL, Shenoy ES. The impact of a reported penicillin allergy on surgical site infection risk. Clin Infect Dis. 2018;66: 329–336. doi:10.1093/cid/cix794

33. Shenoy ES, Macy E, Rowe T, Blumenthal KG. Evaluation and Management of Penicillin Allergy: A Review. JAMA. 2019;321: 188–199. doi: 10.1001/jama.2018.19283

34. Khan DA, Banerji A, Blumenthal KG, Phillips EJ, Solensky R, White AA, et al. Drug allergy: A 2022 practice parameter update. J Allergy Clin Immunol. 2022;150: 1333–1393. doi:10.1016/j.jaci.2022.08.028

35. Guyer AC, Macy E, White AA, Kuruvilla ME, Robison RG, Kumar S, et al. Allergy electronic health record documentation: A 2022 work group report of the AAAAI Adverse Reactions to drugs, Biologicals, and Latex Committee. J Allergy Clin Immunol Pract. 2022;10: 2854–2867. doi:10.1016/j.jaip.2022.08.020

36. Blumenthal KG, Shenoy ES, Wolfson AR, Berkowitz DN, Carballo VA, Balekian DS, et al. Addressing inpatient beta-lactam allergies: A multihospital implementation. J Allergy Clin Immunol Pract. 2017;5: 616–625.e7. doi:10.1016/j.jaip.2017.02.019

37. Blumenthal KG, Lu N, Zhang Y, Walensky RP, Choi HK. Recorded penicillin allergy and risk

of mortality: A population-based matched cohort study. J Gen Intern Med. 2019;34: 1685–1687. doi:10.1007/s11606-019-04991-y

38. Blumenthal KG, Lu N, Zhang Y, Li Y, Walensky RP, Choi HK. Risk of meticillin resistant Staphylococcus aureus and Clostridium difficile in patients with a documented penicillin allergy: population based matched cohort study. BMJ. 2018;361: k2400. doi:10.1136/bmj.k2400

39. Macy E, McCormick TA, Adams JL, Crawford WW, Nguyen MT, Hoang L, et al. Association between removal of a warning against cephalosporin use in patients with penicillin allergy and antibiotic prescribing. JAMA Netw Open. 2021;4: e218367. doi:10.1001/jamanetworkopen.2021.8367

40. Picard M, Robitaille G, Karam F, Daigle J-M, Bédard F, Biron É, et al. Cross-reactivity to cephalosporins and carbapenems in penicillin-allergic patients: Two systematic reviews and meta-analyses. J Allergy Clin Immunol Pract. 2019;7: 2722–2738.e5. doi:10.1016/j.jaip.2019.05.038

41. Macy E. Why was there ever a warning not to use cephalosporins in the setting of a penicillin “allergy”? J Allergy Clin Immunol Pract. 2021;9: 3929–3933. doi:10.1016/j.jaip.2021.06.059

42. Jeffres MN, Hall-Lipsy EA, King ST, Cleary JD. Systematic review of professional liability when prescribing β-lactams for patients with a known penicillin allergy. Ann Allergy Asthma Immunol. 2018;121: 530–536. doi:10.1016/j.anai.2018.03.010

43. Steinberg JP, Braun BI, Hellinger WC, Kusek L, Bozikis MR, Bush AJ, et al. Timing of antimicrobial prophylaxis and the risk of surgical site infections: results from the Trial to Reduce Antimicrobial Prophylaxis Errors. Ann Surg. 2009;250: 10–16. doi:10.1097/SLA.0b013e3181ad5fca

44. de Jonge SW, Gans SL, Atema JJ, Solomkin JS, Dellinger PE, Boermeester MA. Timing of preoperative antibiotic prophylaxis in 54,552 patients and the risk of surgical site infection: A systematic review and meta-analysis. Medicine . 2017;96: e6903. doi:10.1097/MD.0000000000006903

45. Zelenitsky SA, Ariano RE, Harding GKM, Silverman RE. Antibiotic pharmacodynamics in surgical prophylaxis: an association between intraoperative antibiotic concentrations and efficacy. Antimicrob Agents Chemother. 2002;46: 3026–3030. doi:10.1128/AAC.46.9.3026-3030.2002

46. Polk HC Jr, Trachtenberg L, Finn MP. Antibiotic activity in surgical incisions. The basis of prophylaxis in selected operations. JAMA. 1980;244: 1353–1354. Available: https://www.ncbi.nlm.nih.gov/pubmed/7411809

47. Yamada K, Matsumoto K, Tokimura F, Okazaki H, Tanaka S. Are bone and serum cefazolin concentrations adequate for antimicrobial prophylaxis? Clin Orthop Relat Res. 2011;469: 3486–3494. doi:10.1007/s11999-011-2111-8

48. DiPiro JT, Vallner JJ, Bowden TA Jr, Clark BA, Sisley JF. Intraoperative serum and tissue activity of cefazolin and cefoxitin. Arch Surg. 1985;120: 829–832. doi:10.1001/archsurg.1985.01390310067015

49. Rosin E, Uphoff TS, Schultz-Darken NJ, Collins MT. Cefazolin antibacterial activity and concentrations in serum and the surgical wound in dogs. Am J Vet Res. 1993;54: 1317–1321. Available: https://www.ncbi.nlm.nih.gov/pubmed/8214903

50. Rosin E, Ebert S, Uphoff TS, Evans MH, Schultz-Darken NJ. Penetration of antibiotics into the surgical wound in a canine model. Antimicrob Agents Chemother. 1989;33: 700–704. doi:10.1128/AAC.33.5.700

51. Martin C, Portet C, Lambert D, Bruguerolle B, Sastre B, De Micco P, et al. Pharmacokinetics and tissue penetration of single-dose cefotetan used for antimicrobial prophylaxis in patients undergoing colorectal surgery. Antimicrob Agents Chemother. 1992;36: 1115–1118. doi:10.1128/AAC.36.5.1115

52. Martin C, Sastre B, Mallet MN, Bruguerolle B, Brun JP, De Micco P, et al. Pharmacokinetics and tissue penetration of a single 1,000-milligram, intravenous dose of metronidazole for antibiotic prophylaxis of colorectal surgery. Antimicrob Agents Chemother. 1991;35: 2602–2605. doi:10.1128/AAC.35.12.2602

53. Mueller SC, Henkel KO, Neumann J, Hehl EM, Gundlach KK, Drewelow B. Perioperative antibiotic prophylaxis in maxillofacial surgery: penetration of clindamycin into various tissues. J Craniomaxillofac Surg. 1999;27: 172–176. doi:10.1016/s1010-5182(99)80046-8

54. Karjagin J, Pähkla R, Starkopf J. Perioperative penetration of metronidazole into muscle tissue: a microdialysis study. Eur J Clin Pharmacol. 2004;59: 809–813. doi:10.1007/s00228-003-0685-0

55. Garey KW, Dao T, Chen H, Amrutkar P, Kumar N, Reiter M, et al. Timing of vancomycin prophylaxis for cardiac surgery patients and the risk of surgical site infections. J Antimicrob Chemother. 2006;58: 645–650. doi:10.1093/jac/dkl279

56. Wittau M, Wagner E, Kaever V, Koal T, Henne-Bruns D, Isenmann R. Intraabdominal tissue concentration of ertapenem. J Antimicrob Chemother. 2006;57: 312–316. doi:10.1093/jac/dki459

57. Warnke JP, Wildfeuer A, Eibel G, Pfaff G, Klammer A. Pharmacokinetics of ampicillin/sulbactam in patients undergoing spinal microneurosurgical procedures. Int J Clin Pharmacol Ther. 1998;36: 253–257. Available: https://www.ncbi.nlm.nih.gov/pubmed/9629988

58. Martin C, Cotin A, Giraud A, Beccani-Argème M, Alliot P, Mallet MN, et al. Comparison of concentrations of sulbactam-ampicillin administered by bolus injections or bolus plus continuous infusion in tissues of patients undergoing colorectal surgery. Antimicrob Agents Chemother. 1998;42: 1093–1097. doi:10.1128/AAC.42.5.1093

59. Brunner M, Stabeta H, Möller J-G, Schrolnberger C, Erovic B, Hollenstein U, et al. Target site concentrations of ciprofloxacin after single intravenous and oral doses. Antimicrob Agents Chemother. 2002;46: 3724–3730. doi:10.1128/AAC.46.12.3724-3730.2002

60. Kim A, Suecof LA, Sutherland CA, Gao L, Kuti JL, Nicolau DP. In vivo microdialysis study of the penetration of daptomycin into soft tissues in diabetic versus healthy volunteers. Antimicrob Agents Chemother. 2008;52: 3941–3946. doi:10.1128/AAC.00589-08

61. Gasc??n AR, Campo E, Hern??ndez RM, Calvo B, Errasti J, Pedraz JL. Pharmacokinetics and Tissue Distribution of Intravenous Ofloxacin for Antibiotic Prophylaxis in Biliary Surgery. Clinical Drug Investigation. 1998. pp. 491–496. doi:10.2165/00044011-199815060-00005

62. Kinzig M, Sörgel F, Brismar B, Nord CE. Pharmacokinetics and tissue penetration of tazobactam and piperacillin in patients undergoing colorectal surgery. Antimicrob Agents Chemother. 1992;36: 1997–2004. doi:10.1128/AAC.36.9.1997

63. Martin C, Ragni J, Lokiec F, Guillen JC, Auge A, Pecking M, et al. Pharmacokinetics and tissue penetration of a single dose of ceftriaxone (1,000 milligrams intravenously) for antibiotic prophylaxis in thoracic surgery. Antimicrobial Agents and Chemotherapy. 1992. pp. 2804–2807. doi:10.1128/aac.36.12.2804

64. Swoboda S, Oberdorfer K, Klee F, Hoppe-Tichy T, von Baum H, Geiss HK. Tissue and serum concentrations of levofloxacin 500 mg administered intravenously or orally for antibiotic prophylaxis in biliary surgery. J Antimicrob Chemother. 2003;51: 459–462. doi:10.1093/jac/dgk056

65. Tan TL, Shohat N, Rondon AJ, Foltz C, Goswami K, Ryan SP, et al. Perioperative Antibiotic Prophylaxis in Total Joint Arthroplasty: A Single Dose Is as Effective as Multiple Doses. J Bone Joint Surg Am. 2019;101: 429–437. doi:10.2106/JBJS.18.00336

66. Ryan SP, Kildow BJ, Tan TL, Parvizi J, Bolognesi MP, Seyler TM, et al. Is There a Difference in Infection Risk Between Single and Multiple Doses of Prophylactic Antibiotics? A Meta-analysis. Clin Orthop Relat Res. 2019;477: 1577–1590. doi:10.1097/CORR.0000000000000619

67. Branch-Elliman W, O'Brien W, Strymish J, Itani K, Wyatt C, Gupta K. Association of Duration and Type of Surgical Prophylaxis With Antimicrobial-Associated Adverse Events. JAMA Surg. 2019;154: 590–598. doi:10.1001/jamasurg.2019.0569

68. Carender CN, DeMik DE, Glass NA, Noiseux NO, Brown TS, Bedard NA. Do Extended Oral Postoperative Antibiotics Prevent Early Periprosthetic Joint Infection in Morbidly Obese Patients Undergoing Primary Total Joint Arthroplasty? J Arthroplasty. 2021. doi:10.1016/j.arth.2021.03.018

69. Hong CS, Black CS, Ryan SP, Seyler TM. Extended Oral Antibiotics and Infection Prophylaxis after a Primary or Revision Total Knee Arthroplasty. J Knee Surg. 2020;33: 111–118. doi:10.1055/s-0039-3400755

70. DeFrancesco CJ, Fu MC, Kahlenberg CA, Miller AO, Bostrom MP. Extended Antibiotic Prophylaxis May Be Linked to Lower Peri-prosthetic Joint Infection Rates in High-Risk Patients: An Evidence-Based Review. HSS J. 2019;15: 297–301. doi:10.1007/s11420-019-09698-8

71. Kheir MM, Dilley JE, Ziemba-Davis M, Meneghini RM. Extended Oral Antibiotics Prevent Periprosthetic Joint Infection in High-Risk Cases: 3855 Patients With 1-Year Follow-Up. J Arthroplasty. 2021. doi:10.1016/j.arth.2021.01.051

72. Inabathula A, Dilley JE, Ziemba-Davis M, Warth LC, Azzam KA, Ireland PH, et al. Extended Oral Antibiotic Prophylaxis in High-Risk Patients Substantially Reduces Primary Total Hip and Knee Arthroplasty 90-Day Infection Rate. J Bone Joint Surg Am. 2018;100:

2103–2109. doi:10.2106/JBJS.17.01485

73. Khatod M. Prepare for More Antibiotics: Commentary on an article by Avinash Inabathula, MD, et al.: “Extended Oral Antibiotic Prophylaxis in High-Risk Patients Substantially Reduces Primary Total Hip and Knee Arthroplasty 90-Day Infection Rate.” The Journal of bone and joint surgery. American volume. 2018. p. e155. doi:10.2106/JBJS.18.00932

74. Frank JM, Kayupov E, Moric M, Segreti J, Hansen E, Hartman C, et al. The Mark Coventry, MD, Award: Oral Antibiotics Reduce Reinfection After Two-Stage Exchange: A Multicenter, Randomized Controlled Trial. Clin Orthop Relat Res. 2017;475: 56–61. doi:10.1007/s11999-016-4890-4

75. Kuo F-C, Aalirezaie A, Goswami K, Shohat N, Blevins K, Parvizi J. Extended Antibiotic Prophylaxis Confers No Benefit Following Aseptic Revision Total Hip Arthroplasty: A Matched Case-Controlled Study. J Arthroplasty. 2019;34: 2724–2729. doi:10.1016/j.arth.2019.06.012

76. Peng Z, Lin X, Kuang X, Teng Z, Lu S. The application of topical vancomycin powder for the prevention of surgical site infections in primary total hip and knee arthroplasty: A meta-analysis. Orthop Traumatol Surg Res. 2020; 102741. doi:10.1016/j.otsr.2020.09.006

77. Dial BL, Lampley AJ, Green CL, Hallows R. Intrawound Vancomycin Powder in Primary Total Hip Arthroplasty Increases Rate of Sterile Wound Complications. Hip Pelvis. 2018;30: 37–44. doi:10.5371/hp.2018.30.1.37

78. Johnson JD, Nessler JM, Horazdovsky RD, Vang S, Thomas AJ, Marston SB. Serum and Wound Vancomycin Levels After Intrawound Administration in Primary Total Joint Arthroplasty. J Arthroplasty. 2017;32: 924–928. doi:10.1016/j.arth.2015.10.015

79. Sebastian S, Liu Y, Christensen R, Raina DB, Tägil M, Lidgren L. Antibiotic containing bone cement in prevention of hip and knee prosthetic joint infections: A systematic review and meta-analysis. J Orthop Translat. 2020;23: 53–60. doi:10.1016/j.jot.2020.04.005

80. Chan JJ, Robinson J, Poeran J, Huang H-H, Moucha CS, Chen DD. Antibiotic-Loaded Bone Cement in Primary Total Knee Arthroplasty: Utilization Patterns and Impact on Complications Using a National Database. J Arthroplasty. 2019;34: S188–S194.e1. doi:10.1016/j.arth.2019.03.006

81. Yayac M, Rondon AJ, Tan TL, Levy H, Parvizi J, Courtney PM. The Economics of Antibiotic Cement in Total Knee Arthroplasty: Added Cost with No Reduction in Infection Rates. J Arthroplasty. 2019;34: 2096–2101. doi:10.1016/j.arth.2019.04.043

82. Gandhi R, Backstein D, Zywiel MG. Antibiotic-laden Bone Cement in Primary and Revision Hip and Knee Arthroplasty. J Am Acad Orthop Surg. 2018;26: 727–734. doi:10.5435/JAAOS-D-17-00305

83. King JD, Hamilton DH, Jacobs CA, Duncan ST. The Hidden Cost of Commercial Antibiotic-Loaded Bone Cement: A Systematic Review of Clinical Results and Cost Implications Following Total Knee Arthroplasty. J Arthroplasty. 2018;33: 3789–3792. doi:10.1016/j.arth.2018.08.009

84. Kleppel D, Stirton J, Liu J, Ebraheim NA. Antibiotic bone cement’s effect on infection rates

in primary and revision total knee arthroplasties. World J Orthop. 2017;8: 946–955. doi:10.5312/wjo.v8.i12.946

85. Schiavone Panni A, Corona K, Giulianelli M, Mazzitelli G, Del Regno C, Vasso M. Antibiotic-loaded bone cement reduces risk of infections in primary total knee arthroplasty? A systematic review. Knee Surg Sports Traumatol Arthrosc. 2016;24: 3168–3174. doi:10.1007/s00167-016-4301-0

86. Wang J, Zhu C, Cheng T, Peng X, Zhang W, Qin H, et al. A systematic review and meta-analysis of antibiotic-impregnated bone cement use in primary total hip or knee arthroplasty. PLoS One. 2013;8: e82745. doi:10.1371/journal.pone.0082745

87. Iarikov D, Demian H, Rubin D, Alexander J, Nambiar S. Choice and doses of antibacterial agents for cement spacers in treatment of prosthetic joint infections: review of published studies. Clin Infect Dis. 2012;55: 1474–1480. doi:10.1093/cid/cis735

88. Fleischman AN, Austin MS. Local intra-wound administration of powdered antibiotics in orthopaedic surgery. J Bone Jt Infect. 2017;2: 23–28. doi:10.7150/jbji.16649

89. Donovan TJ, Sino S, Paraforos A, Leick J, Friedrich I. Topical vancomycin reduces the incidence of deep sternal wound complications after sternotomy. Ann Thorac Surg. 2022;114: 511–518. doi:10.1016/j.athoracsur.2021.09.036

90. Awad AN, Heiman AJ, Patel A. Implants and breast pocket irrigation: Outcomes of antibiotic, antiseptic, and saline irrigation. Aesthet Surg J. 2022;42: NP102–NP111. doi:10.1093/asj/sjab181

91. Hemmingsen MN, Larsen A, Weltz TK, Ørholt M, Wiberg S, Bennedsen AK, et al. Prophylactic treatment of breast implants with a solution of gentamicin, vancomycin and cefazolin antibiotics for women undergoing breast reconstructive surgery: protocol for a randomised, double-blind, placebo-controlled trial (The BREAST-AB trial). BMJ Open. 2022;12: e058697. doi:10.1136/bmjopen-2021-058697

92. McHugh SM, Collins CJ, Corrigan MA, Hill ADK, Humphreys H. The role of topical antibiotics used as prophylaxis in surgical site infection prevention. J Antimicrob Chemother. 2011;66: 693–701. doi:10.1093/jac/dkr009

93. Huiras P, Logan JK, Papadopoulos S, Whitney D. Local antimicrobial administration for prophylaxis of surgical site infections. Pharmacotherapy. 2012;32: 1006–1019. doi:10.1002/phar.1135

94. Pan S, Rodriguez D, Thirumavalavan N, Gross MS, Eid JF, Mulcahy J, et al. The use of Antiseptic Solutions in the prevention and management of Penile Prosthesis Infections: A review of the cytotoxic and Microbiological Effects of Common Irrigation Solutions. J Sex Med. 2019;16: 781–790. doi:10.1016/j.jsxm.2019.03.271

95. Lokeshwar SD, Bitran J, Madhusoodanan V, Kava B, Ramasamy R. A surgeon's guide to the various antibiotic dips available during penile prosthesis implantation. Curr Urol Rep. 2019;20: 11. doi:10.1007/s11934-019-0874-8

96. Best JC, Clavijo RI. Best practices for infection prevention in penile prosthesis surgery. Curr Opin Urol. 2020;30: 302–308. doi:10.1097/MOU.0000000000000744

97. Hyland SJ, Kusumi RK, Lopez LF, Kramer BJ, Fada RA, Mohan VS, et al. Antimicrobial Stewardship in Total Joint Arthroplasty: Outcomes of a Collaborative Program Implementation. J Am Acad Orthop Surg. 2022;30: e1327–e1336. doi:10.5435/JAAOS-D-21-00722

98. Segala FV, Murri R, Taddei E, Giovannenze F, Del Vecchio P, Birocchi E, et al. Antibiotic appropriateness and adherence to local guidelines in perioperative prophylaxis: results from an antimicrobial stewardship intervention. Antimicrob Resist Infect Control. 2020;9: 164. doi:10.1186/s13756-020-00814-6

99. Ahmed NJ, Almalki ZS, Alfaifi AA, Alshehri AM, Alahmari AK, Elazab E, et al. Implementing an Antimicrobial Stewardship Programme to Improve Adherence to a Perioperative Prophylaxis Guideline. Healthcare (Basel). 2022;10. doi:10.3390/healthcare10030464

100. Pardo A, Ntabaza V, Rivolta M, Goulard A, Sténuit S, Demeester R, et al. Impact of collaborative physician-pharmacist stewardship strategies on prophylactic antibiotic practices: a quasi-experimental study. Antimicrob Resist Infect Control. 2022;11: 100. doi:10.1186/s13756-022-01138-3

101. Martinez-Sobalvarro JV, Júnior AAP, Pereira LB, Baldoni AO, Ceron CS, Dos Reis TM. Antimicrobial stewardship for surgical antibiotic prophylaxis and surgical site infections: a systematic review. Int J Clin Pharm. 2022;44: 301–319. doi:10.1007/s11096-021-01358-4

102. Patel GP, Hyland SJ, Birrer KL, Wolfe RC, Lovely JK, Smith AN, et al. Perioperative clinical pharmacy practice: Responsibilities and scope within the surgical care continuum. J Am Coll Clin Pharm. 2019;94: 201. doi:10.1002/jac5.1185

Question Report	
Report Generated:	
Topic	**Actual Duration (minutes)**
Premier April 4, 2023 Antimicrobial Stewardship Forum	**84**
Question Details	
Question	**Answer**
we need help with stopping post-op antibiotics but ASHP has not updated their guidelines. Is there a good guideline that states which surgeries should have NO post-op abx use and which ones should and for how long?	Great question. The ACS/SIS guidelines and the CDC guidelines discuss this in the greatest detail among current guidelines, but procedure-specific assessment of primary literature is still important in my opinion. See my supplemental handout "antimicrobial prophylaxis guideline comparison" for a summary of what the various guidelines say on this specific topic. I recommend working with surgical teams more longitudinally to assess their antibiotic use for a particular type of procedure to include the optimal duration of prophylaxis, rather than trying to get all surgeons/procedures to stop postop antibiotic prescribing. This strategy will help you work with a more focused group of providers where you can collaboratively review the evidence for risk/benefit in that particular patient population. For example, in TJA, there is mounting evidence that extended postop antibiotics (i.e. oral antibiotics at discharge after TJA) can effectively reduce PJI, though this comes at the cost of selecting for resistent pathogens in subsequent PJIs (see the references in slide 63 "Right duration..."). We're not going to get the surgeons to completely abandon this practice for this procedure and there isn't a definite evidence-based answer. So we collaborated with them to review the studies and limit duration as much as we can and also limit to certain patients with risk factors rather than universal protocols.
For an ortho patient with an MRSA infection due to hardware in the ankle, would it be reasonable to treat with Daptomycin vs Vancomycin simply due to desire to avoid vanco monitoring and multiple daily dosing?	If treating an MRSA bone/joint infection then I think either could be reasonable based on your local stewardship practices and institutional resources. It may also be reasonable to treat with an oral agent based on the results of the OVIVA trial though too! (https://www.nejm.org/doi/full/10.1056/NEJMoa1710926)
Do you have any tips for reminding anesthesia to redose intraoperatively? Is there anything that can be incorporated into EMR? What works at your institution?	Yes we have for a while now had the circulator RNs (who manage the "time-out") also keep track of this and cue the anesthesia team, but now we have also build into Epic when these intervals are approaching and so the anesthesia providers do get an alert on their screen. So between these two mechanisms our compliance with intraop dosing appears very high
Not a question but just a comment - we have a surgeon who always wants a vial of polymyxin B for spinal surgeries!	This is likely for a common spinal surgery irrigation- this is an old practice among old spine surgeons in my experience! ;) All dates back to this study with "zero infection rate" https://pubmed.ncbi.nlm.nih.gov/9736080/
Are there other options for pre-op decolonization? At a confernce there was a vendor that promoting an intranasal alcohol product just before surgery for decolonization.	Yes there are, I have read some about the premade alcohol nasal swab product which does seem infinitely more convenient and comfortable, but I'm just not sure the comparative efficacy data is there yet to change practice for us. I have been assessing this though
In your practice, how do long do you see post op prophylaxis abx being given for? Because by the book, it would be 24hrs but in my practice, the practioners give beyond that time frame.	I would say we're pretty good at </=24 hours for the vast majority of procedures, and 48hours for CTS, and total joints are their own constant evolution on this front (see the first question response above)
In your practice, have you see prolonged pre-op abx given for "high risk" patients prior to urological procedures like up to 1 month in advance?	that seems a bit excessive to me! Pretty much chronic suppression at that point, which doesn't seem ideal. My experience has been that the urologist checks urine Cx in office a couple/few weeks prior to procedure and treat for 7-10 day courses prior to surgery usually, and then we will still consider covering the organism in the preop abx regimen