

Antimicrobial stewardship program associated with **optimized antibiotic selection**, **decreased total antibiotic exposure**, and **cost savings** in total joint arthroplasty

Antimicrobial stewardship in major orthopedic surgery: final program results

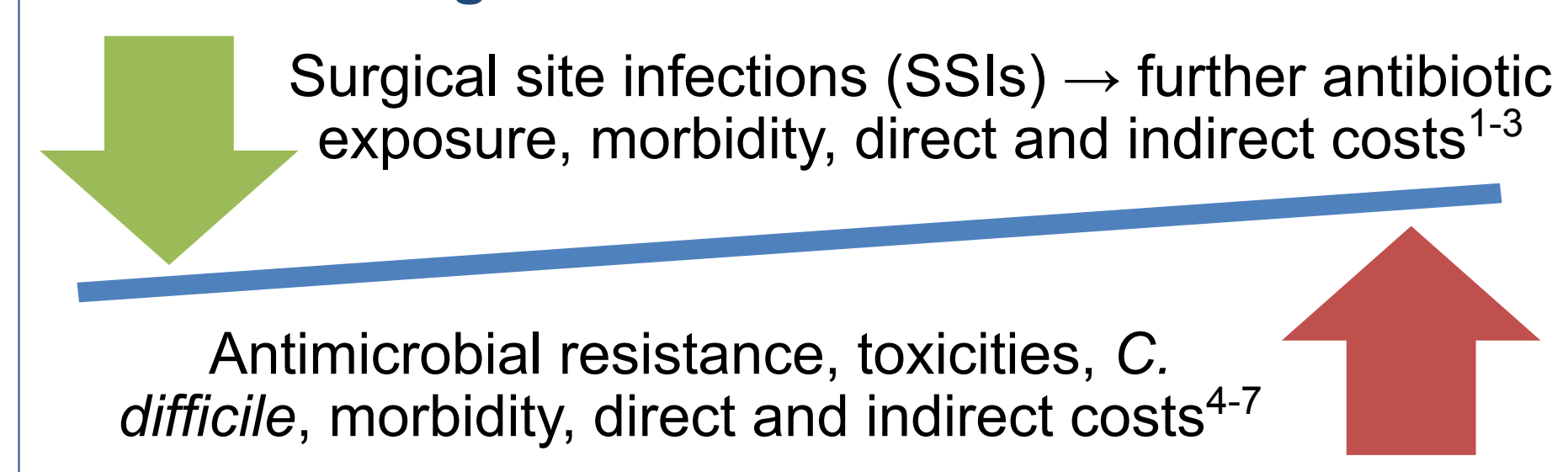
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Introduction

Antimicrobial Stewardship: known to many, newer to orthopedics

- High stakes in total joint arthroplasty (TJA)

Where is the right balance?



Recent reviews underscore challenges in defining best practice antibiotic use in TJA surgery^{6,7}

- Limited high-quality data for many antibiotic modalities
- Variation in drug selection, dosing strategy, route of administration, timing, duration, phase of care

→ **Unmet need for orthopedic surgery antimicrobial stewardship program (Ortho ASP) development, implementation, and assessment**

Hypothesis

A collaborative, comprehensive Ortho ASP can optimize antibiotic use in TJA

Indicators of optimal antibiotic use:

- Narrower, more targeted spectrum
- Reduced number of exposures
- Improved or no effect on SSI rates
- Improved or no effect on postop AKI
- Reduced direct and/or indirect costs

Methods

Design: single-center, prospective, pre-post interventional study

Population: all TJA patients at a large surgery center in an urban, community teaching hospital

Intervention: Ortho ASP implementation

ASP Work Team – Reviewed literature and generated recommendations

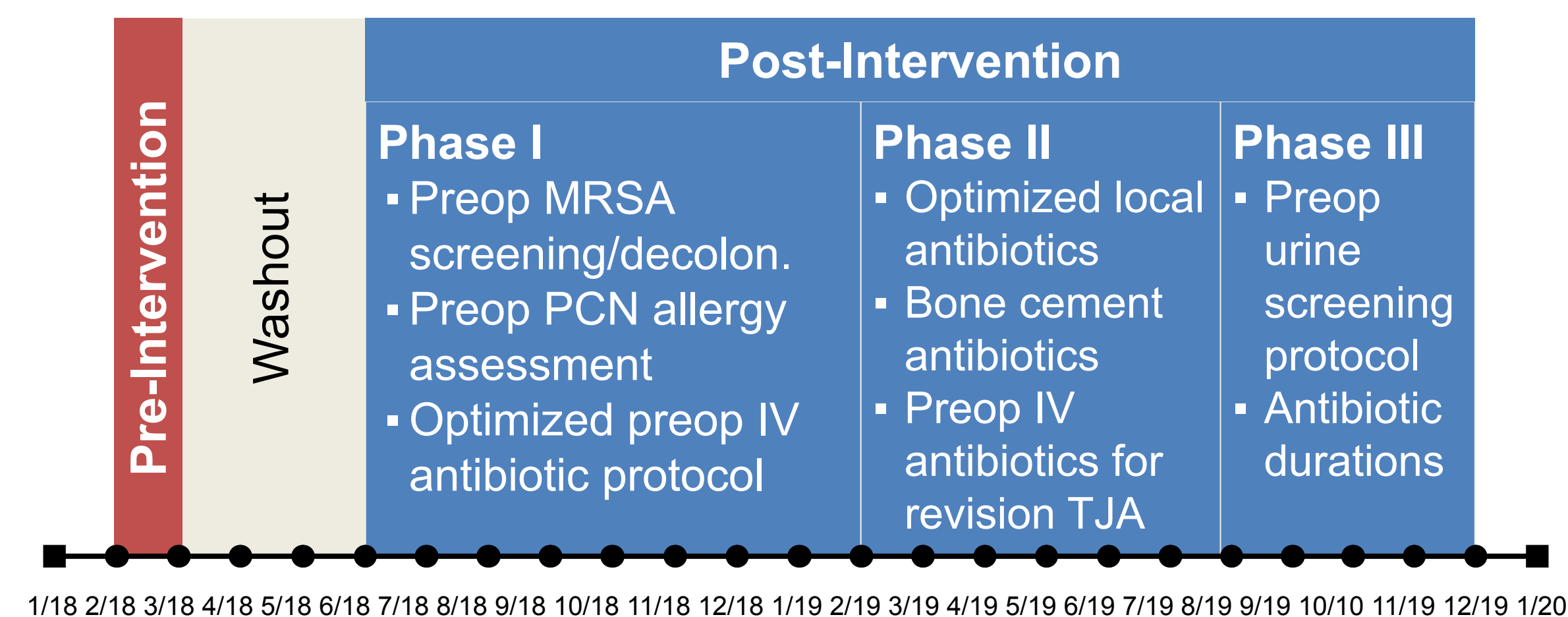
Ortho Quality Committee – Discussed and approved proposed changes

Change Team – Operationalized and implemented approved process changes

Ortho ASP Lead – Maintained SSI case series and monitoring dashboard

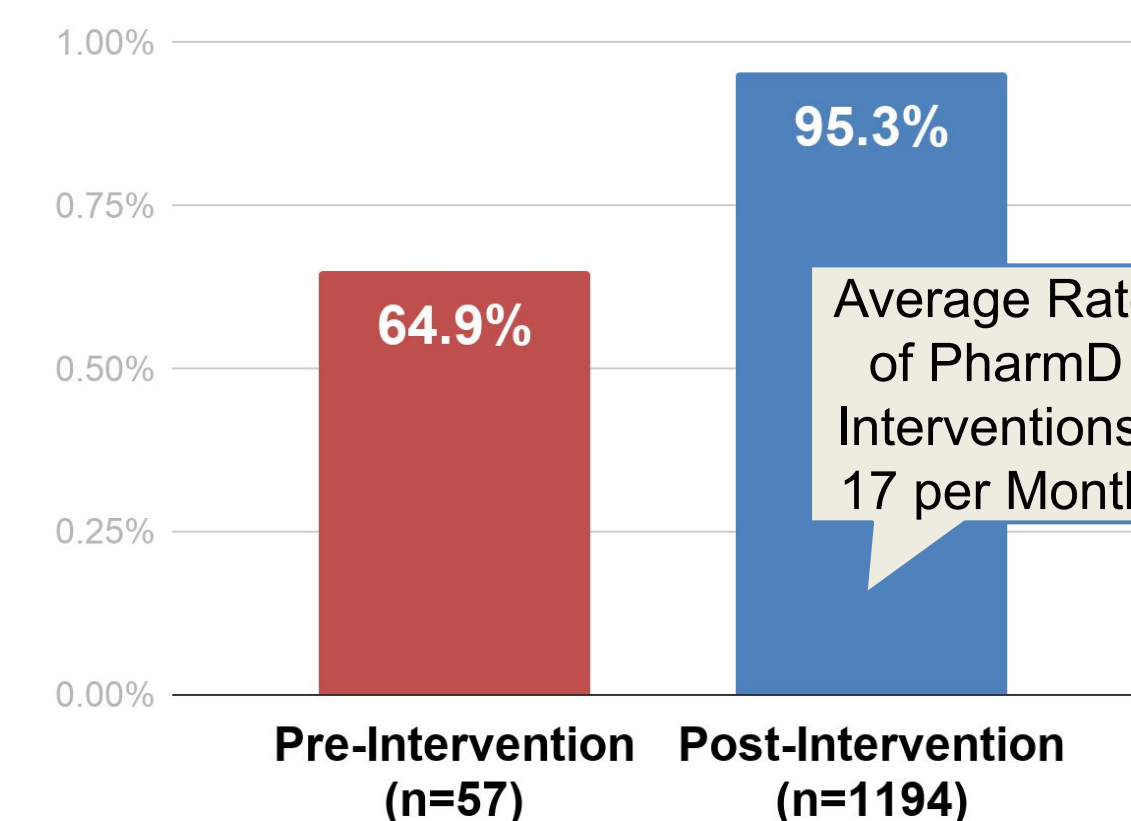
- 12 total recommendations issued
- 11 accepted changes
- 3 grouped implementations

Timeline



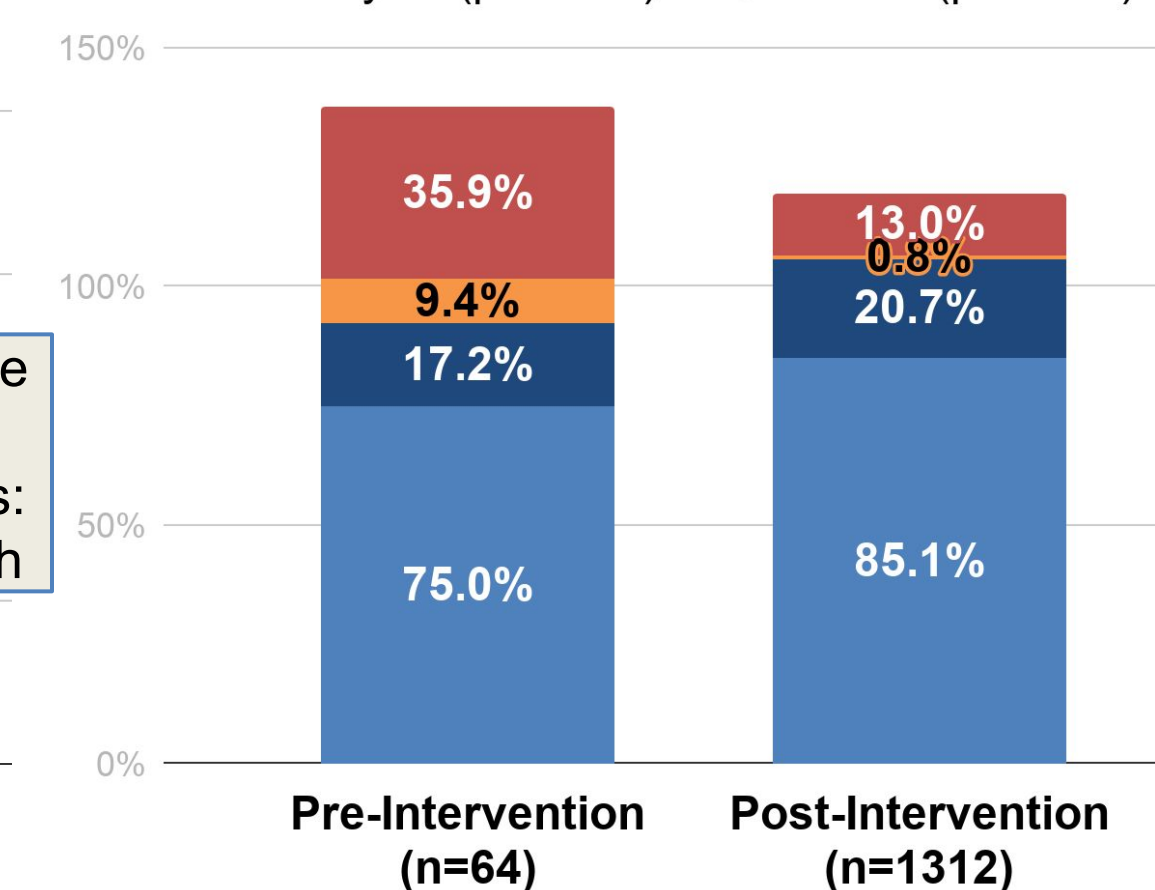
Results – Antibiotic Selection

Primary Outcome: Rate of optimal preop IV antibiotic selection for primary TJA (Fisher's exact test, $p < 0.001$)



Secondary Outcomes: Antibiotic selection (IV+irrigation) for all TJA

Gentamicin ($p < 0.001$) | Clindamycin ($p < 0.001$)
 Vancomycin ($p = 0.634$) | Cefazolin ($p = 0.049$)



References and Disclosures

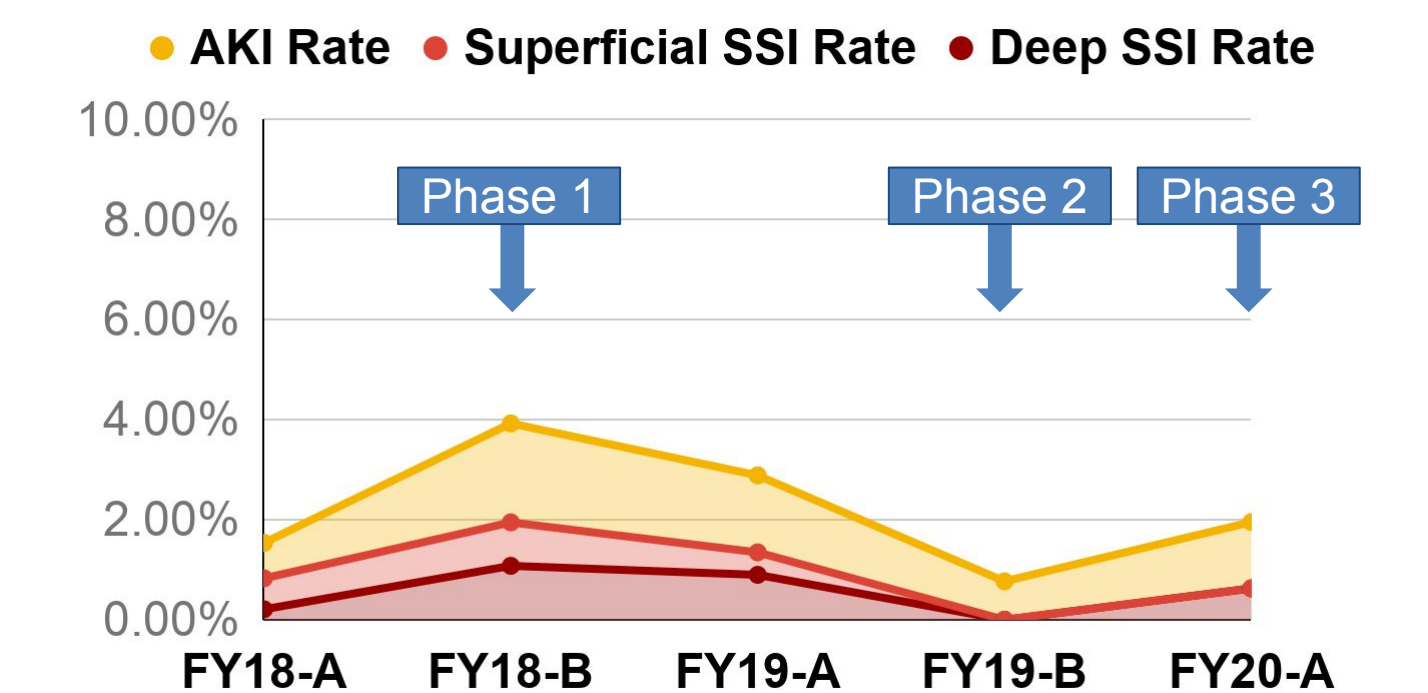
1) J Arthroplasty. 2012;27(8 Suppl):61-65 e61; 2) JAMA Surg. 2014;149(6):575-581; 3) J Arthroplasty. 2018 Feb;33(2):521-526; 4) Arthroplast Today. 2018 Sep; 4(3): 335-339; 5) Geriatr Orthop Surg Rehabil. 2012 Dec; 3(4): 157-163; 6) J Am Acad Orthop Surg 2014;22:772-781; 7) J Am Acad Orthop Surg 2020;28:e793-e802.
 This project was approved by the OhioHealth Institutional Review Board (IRB).
 This project was not supported by any form of funding.



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Results – Quality Outcomes

Descriptive Analysis: Institutional postop SSI and AKI rates for primary TJA



Descriptive Analysis: Institutional *S. aureus* colonization rates for all TJA (n=1312): **MRSA: 4%** | **MSSA: 9%** | **Unk: 6%**

Results – Cost Analysis

	Pre: 10-12/17	Post: 10-12/19	Difference
SSI Events²			
-Deep	1 x \$25,000	1 x \$25,000	\$0
-Superficial	0 x \$7,000	0 x \$7,000	\$0
AKI Events⁴	8 x \$25,000	5 x \$25,000	-\$75,000
IV Antibiotic Costs: Widely variable throughout - excluded			
Local Antibiotic Costs			
-Gentamicin	200 x \$120	0 x \$120	-\$24,000
-Tobramycin	200 x \$390	0 x \$390	-\$78,000
-Vancomycin	800 x \$60	1000 x \$60	+\$12,000
Testing Costs			
MRSA Screening	0 x \$25	1000 x \$25	+\$25,000
Urine Screening	1000 x \$62	200 x \$62	-\$50,000
Total Net Cost per 1000 TJA Cases:			-\$190,000