



# Impact of Postoperative Antibiotic Prophylaxis Duration on Surgical Site Infections in Autologous Breast Reconstruction

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## Disclosures:

- John Kim receives research funding and is on the advisory board for the Musculoskeletal Transplant Foundation. Keith Hume is employed by the American Society of Plastic Surgeons (ASPS). Robert Murphy, Jr. is the current president of the ASPS. Neil Fine receives research funding from Allergan. Brian Thornton is a consultant for Mentor and LifeCell. Nora Hansen is a member of the Speakers' Bureau for Genentech. All other authors have no relevant relationships to disclose.

## Background:

- Antibiotic practices have recently been the topic of increased scrutiny in breast reconstruction.
- Some surgeons prescribe prolonged postoperative antibiotics following breast reconstruction; however, evidence is lacking to support this practice.<sup>1-2</sup>
- Despite their widespread use in breast reconstruction, antibiotics are not without risks and complications of their own.
- Thus, a decision to prescribe extended outpatient antibiotics needs to be justified by the available evidence.

<sup>1</sup>Brahmbhatt, R. D., Huebner, M., Scow, J. S., et al. National practice patterns in preoperative and postoperative antibiotic prophylaxis in breast procedures requiring drains: survey of the American Society of Breast Surgeons. *Annals of surgical oncology* .19: 3205-3211, 2012.; <sup>2</sup>Phillips, B. T., Wang, E. D., Mirrer, J., et al. Current practice among plastic surgeons of antibiotic prophylaxis and closed-suction drains in breast reconstruction: Experience, evidence, and implications for postoperative care. *Annals of plastic surgery*. 66: 460-465, 2011.

## Methods:

- **Objective:** To evaluate the association between postoperative antibiotic duration and the rate of surgical site infection (SSI) in autologous breast reconstruction. We investigated this question using the Tracking Operations and Outcomes for Plastic Surgeons (TOPS) database.
- **Study Design:** Retrospective Cohort Study
- **Intervention of interest:** Postoperative duration of antibiotic prophylaxis  $\leq 24$  hours or  $> 24$  hours after surgery
- **Primary outcome of interest:** Presence of SSI within 30-days
- **Analysis:** Cohort characteristics and 30-day outcomes were compared using  $\chi^2$  and Fischer's exact tests for categorical variables and Student's *t*-tests for continuous variables. Multivariate logistic regression was utilized to control for confounders.

# Table 1. Patient Demographics for Non-Latissimus Autologous Reconstructions

	Antibiotics $\leq$ 24 hours (n= 364)	Antibiotics $>$ 24 hours (n= 219 )	p-value
Age, yrs	50 $\pm$ 9.1	50 $\pm$ 8.1	0.487
BMI, kg/m <sup>2</sup>	28 $\pm$ 4.7	29 $\pm$ 4.4	<b>0.007</b>
Procedure Duration (min)	344 $\pm$ 164.5	370 $\pm$ 165.6	0.063
Race, Non-white	46 (12.64%)	40 (18.26%)	0.064
Diabetes	13 (3.57%)	10 (4.57%)	0.661
Current smoker	21 (5.77%)	13 (5.94%)	0.934
ASA Class $>$ 2	20 (5.49%)	11 (5.02%)	0.806
Outpatient	21 (5.77%)	13 (5.94%)	0.934
Bilateral procedure	101 (27.75%)	69 (31.51%)	0.333

- Patients whose antibiotics were continued for greater than 24 hours postoperatively tended to be heavier (BMI of 29 vs. 28, p= 0.007) on average than those whose antibiotics were discontinued after 24 hours.

## Table 2. Patient Demographics for Latissimus Dorsi Flap Reconstructions

	Antibiotics $\leq$ 24 hours (n= 295)	Antibiotics $>$ 24 hours (n= 158 )	p-value
Age, yrs	51 $\pm$ 9.4	52 $\pm$ 10.35	0.487
BMI, kg/m <sup>2</sup>	27 $\pm$ 6.4	28 $\pm$ 5.7	0.651
Procedure Duration (min)	209 $\pm$ 76.8	237 $\pm$ 92.1	<b>0.001</b>
Race, Non-white	29 (9.83%)	12 (7.59%)	0.429
Diabetes	13 (4.41%)	8 (5.06%)	0.816
Current smoker	32 (10.85%)	18 (11.39%)	0.86
ASA Class $>$ 2	39 (13.22%)	20 (12.66%)	0.865
Outpatient	50 (16.95%)	28 (17.72%)	0.836
Bilateral Procedure	63 (21.36%)	34 (21.52%)	0.968

- Patients whose antibiotics were continued for greater than 24 hours postoperatively had longer operative times (237 vs. 209 minutes, p = 0.001) on average than those whose antibiotics were discontinued after 24 hours.

## Table 3. Rate of SSI, by Procedure Type

	Duration of Postoperative Antibiotics	n	Rate of SSI	Number of SSI	p-value
Overall	≤ 24 hours	659	5.01%	33	0.109
	> 24 hours	377	2.92%	11	
Non-Latissimus	≤ 24 hours	364	5.49%	20	0.228
	> 24 hours	219	3.20%	7	
Latissimus Dorsi Flap	≤ 24 hours	295	4.41%	13	0.439
	> 24 hours	158	2.53%	4	
TRAM Flap	≤ 24 hours	246	6.50%	16	0.497
	> 24 hours	133	4.51%	6	
Free Flap	≤ 24 hours	118	3.39%	4	0.4
	> 24 hours	86	1.16%	1	

- The rate of surgical site infections did not differ significantly between patients who received greater than 24 hours of antibiotics compared to those whose antibiotics were discontinued after 24 hours. These findings held across procedure types.

# Table 4. Logistic Regression for SSI for Non-Latissimus Autologous Breast Reconstructions

	Odds Ratio	95% CI		p-value
Age	.990	.945	1.037	.679
BMI	1.066	.984	1.155	.120
Race	1.237	.438	3.493	.688
Inpatient	.583	.074	4.570	.608
Active Smoking	.604	.078	4.674	.629
Diabetes	2.734	.670	11.163	.161
ASA Class > 2	.981	.199	4.845	.981
Antibiotic Duration	1.919	.782	4.707	.155
Bilateral Procedure	1.060	.420	2.672	.903
Duration of Procedure	.999	.996	1.002	.605

- Antibiotic duration was not predictive of SSI in multivariate regression modeling.



## Table 5. Logistic Regression for SSI for Latissimus Dorsi Flap Breast Reconstructions

	Odds Ratio	95% CI		p-value
Age	.993	.944	1.045	.796
BMI	1.034	.956	1.118	.399
Race	.947	.194	4.628	.947
Inpatient	.339	.043	2.669	.304
Active Smoking	1.015	.210	4.907	.985
Diabetes	.731	.079	6.726	.782
ASA Class > 2	2.149	.638	7.242	.217
Antibiotic Duration	1.904	.590	6.139	.281
Bilateral Procedure	.582	.150	2.249	.432
Duration of Procedure	1.004	.998	1.010	.185

- Antibiotic duration was not predictive of SSI in multivariate regression modeling.

## Conclusions:

- This is the largest study to date to examine the association between postoperative antibiotic duration and SSI rate in autologous breast reconstruction.
- We did not find a statistically significant difference in the rate of SSI in patients who received 24 hours of postoperative antibiotics compared to those that received antibiotics for greater than 24 hours.
- Our study does not provide evidence to support continuing antibiotics beyond 24 hours postoperatively for patients undergoing autologous breast reconstruction.