

# Inappropriate Prophylactic Use of Antibiotics in Gynecologic Surgeries in an Inner City Hospital

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## Abstract

As antibiotic resistance is an increasing healthcare issue, promotion of antibiotic stewardship within hospitals has led to research into their proper use. The American College of Obstetricians and Gynecologists (ACOG) has specific recommendations for antimicrobial prophylaxis prior to gynecologic procedures. We hypothesized that patients in an inner-city hospital in Oklahoma City, Oklahoma undergoing gynecologic procedures were receiving prophylactic antibiotics that were otherwise not indicated for their surgery. A retrospective chart review was performed from July, 2017 to June, 2018. 314 surgeries were performed in this time and 169 cases met inclusion criteria as gynecologic procedures with no indication for antimicrobial prophylaxis. Of the 169 included cases, 98 (57.99%) revealed antibiotics were inappropriately given ( $p < 0.5$ ). The most common procedure in which misuse was noted were laparoscopic procedures without entry into the bowel or vagina, composing 61.2% of cases. Cefazolin was the most frequently used medication and was given in 84.7% of the cases. These results reflect the overuse of antibiotics for surgical prophylaxis, which contributes to increasing antibiotic resistance in women undergoing elective gynecologic procedures. Overall, this is hindering the progressive movement towards promotion of antibiotic stewardship. We hope that these study results will limit the misuse of antibiotics in a hospital setting, and specifically in surgical specialties.

## Introduction

- Most gynecologic surgical infections arise when bacteria endogenous to the patient's skin or vagina invade the surgical sites, with the most common bacterial species being gram positive cocci such as staphylococci (2).
- Over-use of prophylactic antibiotics for procedures in which evidence does not support their use leads to the induction of bacterial resistance, and makes future treatment of surgical site infections more complicated.
- Bacterial resistance is becoming a growing healthcare issue in the United States and limiting the unnecessary use of antibiotics is crucial to decrease the chance of growing resistance.
- ACOG has specific recommendations for which surgical procedures require prophylactic antibiotics based on extensive research and meta-analyses (see Table 1).
- Utilizing antimicrobial prophylaxis when suggested can help decrease the bacterial contamination leading to surgical site infections.



## Methods

- A retrospective chart review of gynecologic procedures at Integris Southwest Medical Center between July 1, 2017 and June 30, 2018
- Age criteria was at least eighteen years of age at the time of the procedure.
- Inclusion criteria for this study were gynecologic procedures performed at Integris Southwest Medical Center that did not require antibiotic prophylaxis according to ACOG recommendations (Table 1).
- Cases were separated based on antibiotics administered versus not administered. The Medication Administration Report (MAR) from the specific encounter was reviewed to identify antibiotic and dose administered.
- Cases excluded from this study were those with recommendations for prophylaxis prior to incision (ex. Hysterectomy).
- Other exclusions were re-operative procedures, combined cases with General Surgery and those procedures with no clearly established recommendations for antibiotic prophylaxis.

## Results

- 169 gynecologic surgeries met criteria for no antibiotics indicated for procedure.
- There was misuse of antibiotic prophylaxis in 98 of 169 cases (57.99%).
- Using chi square test, the p-value is 0.00001, which is statistically significant ( $p < 0.5$ ).
- Case categories were laparotomy without entry into the bowel or vagina (5/98, 5.10%), cervical tissue excision procedures (6/98, 6.1%), cystoscopy (2/98, 2.04%), laparoscopic procedures without entry into the bowel or vagina (60/98, 61.2%), operative and diagnostic hysteroscopy (33/98, 33.7%), D&C for non-pregnancy indications (2/98, 2.0%), cervical cerclage (1/98, 1.0%), and vaginal skin procedures (6/98, 6.1%).

Table 1. Recommended Antibiotic Prophylactic Regimens by Procedure

Procedure	Antibiotic
Laparotomy without entry into bowel or vagina	Consider cefazolin
Cervical tissue excision procedures (LEEP, biopsy, endocervical curettage)	Not recommended
Cystoscopy**	Not recommended
Endometrial biopsy	Not recommended
Laparoscopic procedures without entry into bowel or vagina	Not recommended
Hysterosalpingogram <sup>††</sup>	Not recommended
Chromotubation	Not recommended
Saline infusion sonography	Not recommended
Hysteroscopy	Not recommended
Operative	Not recommended
Diagnostic	Not recommended
Intrauterine device insertion	Not recommended
Oocyte retrieval	Not recommended
D&C for nonpregnancy indications	Not recommended
Urodynamics**	Not recommended

## Results, cont'd

- The most common procedure with antibiotic misuse were laparoscopic procedures.
- Cefazolin was the most commonly utilized antimicrobial at 84.8%.
- Other antimicrobials ordered and dispensed incorrectly included Clindamycin (6.1%), Clindamycin in combination with Gentamicin (4.1%), Doxycycline (4.1%), and Doxycycline in combination with Cefazolin (1.0%).

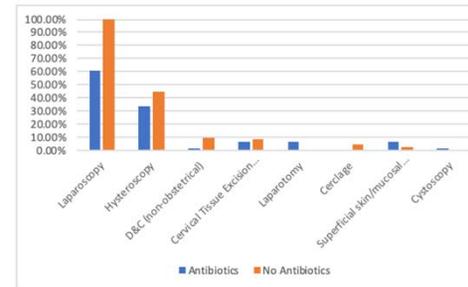
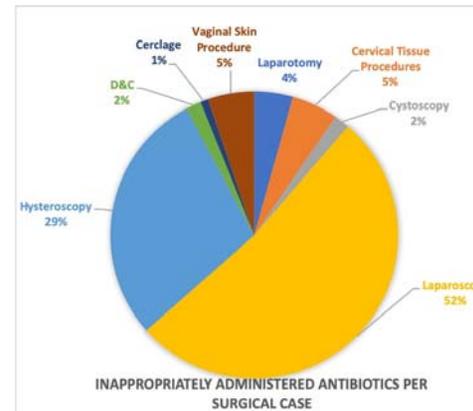


Figure 2: Cases for which antibiotics are not recommended categorized by procedure type. Blue indicates antibiotics given, orange indicates antibiotics were not given.



## Conclusions

- The results of this study demonstrated the overuse of antibiotics prior to gynecologic surgeries, despite antibiotics not being indicated for those procedures as recommended by ACOG.
- According to the Center for Disease Control (CDC), 20-50% of all antibiotics prescribed in the United States are unnecessary or inappropriate (4).
- The CDC reports that more than two million people possess antibiotic resistant organisms, leading to about 23,000 deaths annually from infection that are unable to be treated (4).
- Antibiotic Stewardship Programs contain various aspects to approach limiting antibiotic distribution including antibiotic "time outs" and continued employee education.
- Hospitals should monitor antibiotic distribution to identify trends and correct over-distribution as needed.
- Having one standard set of guidelines and recommendations in each field allows unison amongst practicing physicians (ACOG for OB/GYNs)
- Strengths of the study: moderate case numbers and statistically significant amount of misuse of antibiotics for surgical prophylaxis
- Weakness of the study: limited to one hospital
- Future study ideas: expand data with multiple hospitals, evaluate state-wide and regional differences, implement electronic medical record changes
- The end goal is placing patient health and antibiotic stewardship at the forefront of the healthcare field

## References

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