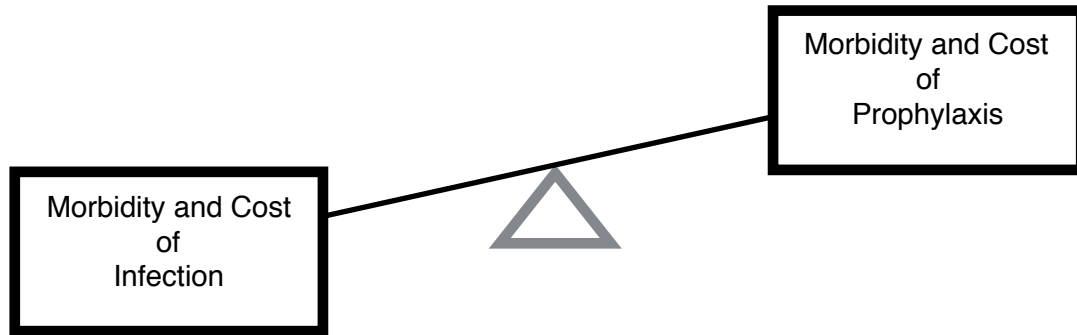


# SURGICAL ANTIMICROBIAL PROPHYLAXIS

## 1. DECISION PROCESS FOR SURGICAL ANTIMICROBIAL PROPHYLAXIS.



## 2. REQUIREMENTS FOR PROPHYLAXIS BY DEGREE OF POSSIBLE CONTAMINATION.

	CLEAN	CLEAN CONTAMINATED	CONTAMINATED	DIRTY
PROPHYLAXIS	??? (see below)	YES	YES	N/A (Considered Rx)

## 3. CONSIDER PROPHYLAXIS FOR CLEAN SURGERY IN THE FOLLOWING SITUATIONS

### A. PREMORBID PATIENT RELATED FACTORS

Extremes of age  
Immunocompromised (poor nutritional status, neutropenia, immunosuppressive agents)  
Obesity (5x increased risk)  
Diabetes Mellitus  
Current tobacco use

### B. PRE-OP PATIENT STATUS

Prolonged hospitalisation  
Co-existent remote body site infection  
Poor blood sugar control  
Abnormal temperature - hypothermia or fever

### C. SURGERY RELATED FACTORS

Long duration of surgery  
Surgeons experience and technique  
Issues related to instrument sterilization

## SURGICAL ANTIMICROBIAL PROPHYLAXIS

4.

<b>APPLYING THE PRINCIPLES OF ANTIMICROBIAL STEWARDSHIP</b>		
	<b>RECOMMENDATION</b>	<b>GOAL</b>
<b>RIGHT DRUG</b>	<ol style="list-style-type: none"> <li>1. Refer to table for Antimicrobial Prophylaxis by Surgery Type</li> </ol>	<ol style="list-style-type: none"> <li>1. Choose an agent with activity against the pathogen most likely to contaminate the surgical site</li> <li>2. Choose a narrow spectrum agent as there is little evidence that broad spectrum agents result in lower rates of surgical site infection.</li> <li>3. There is no evidence for Vancomycin prophylaxis in areas with high MRSA prevalence</li> </ol>
<b>RIGHT DOSE</b>	<ol style="list-style-type: none"> <li>1. Use <b>weight based dosing</b> for obese patients.</li> <li>2. <b>Repeat intraoperative dose</b> if operative time exceeds 2 half lives of the drug(see dosing table) OR if there is excessive bleeding</li> <li>3. <b>No adjustment for renal or hepatic function</b> when using single dose prophylaxis.</li> </ol>	<ol style="list-style-type: none"> <li>1. To ensure adequate drug levels(&gt;MIC) in the serum and tissues for the interval during which the surgical site is open.</li> </ol>
<b>RIGHT TIME</b>	<ol style="list-style-type: none"> <li>1. Start infusion of prophylactic drug <b>within 60 minutes before surgical incision.</b></li> <li>2. For Vancomycin or Fluoroquinolones, start within 120 minutes before surgical incision</li> <li>3. Complete infusion before surgical incision.</li> </ol>	
<b>RIGHT DURATION</b>	<ol style="list-style-type: none"> <li>1. <b>Single pre-op dose</b> in most cases.</li> <li>2. No greater than 24 hours and regardless of the presence of surgical drains or vascular catheters beyond 24 hours.</li> </ol>	<ol style="list-style-type: none"> <li>1. To use antimicrobial agents for the shortest effective period to minimize cost, adverse drug effect (eg. C&gt;Difficile) and the development of Antimicrobial Resistance</li> </ol>

## **SURGICAL ANTIMICROBIAL PROPHYLAXIS**

### **5. SPECIAL SITUATIONS.**

#### **A. β LACTAM ALLERGY**

1. True allergic reactions are Type 1 Hypersensitivity reactions mediated by IgE
  - Occur within 60 minutes of drug administration
  - Anaphylaxis
  - Urticaria
  - Bronchospasm
  - Exfoliative dermatitis ( Stevens Johnson Syndrome, Toxic Epidermal Necrolysis and Severe bullous Erythema Multiforme)
2. For documented or presumed IgE mediated Penicillin Allergy, DO NOT USE Cephalosporins or Carbapenems for prophylaxis

#### **B. ON TREATMENT FOR REMOTE INFECTION.**

1. Where patients are on antimicrobial treatment for pre-existing remote infection give appropriate antibiotic prophylaxis within 60 minutes before surgical incision
  - Extra dose of antibiotic being used for treatment if this covers the organisms most likely to contaminate the surgical site

**OR**

  - Recommended antibiotic for prophylaxis as suggested for surgery type below
2. Where patients with CKD are already on Vancomycin, it is recommended to use Cefazolin for prophylaxis. ( Especially if gram negative organisms are at risk for contaminating the surgical site.

#### **C. MRSA**

1. Staphylococcus Aureus accounts for 30% of surgical site infections and 50% of these are MRSA (US data). The latter contributes to increase in cost, mortality and LOS
2. Despite the increased prevalence of MRSA, there is no evidence that prophylactic Vancomycin reduces surgical site infection.
3. When using Vancomycin for prophylaxis, it should be noted that the drug is less effective against Methicillin Sensitive Staph Aureus (MSSA) and one should consider adding Cefazolin as well.
4. Consider Vancomycin prophylaxis in patients with
  - a. Known MRSA colonization
  - b. At high risk of MRSA colonization
    1. Hospitalisation within the last 12 months
    2. Nursing Home Residents
    3. Patients on hemodialysis
    4. Patients with HIV

## **SURGICAL ANTIMICROBIAL PROPHYLAXIS**

<b>ANTIMICROBIAL PROPHYLAXIS BY SURGERY TYPE</b>			
<b>TYPE OF PROCEDURE</b>	<b>RECOMMENDED AGENTS</b>	<b>ALTERNATIVE AGENTS FOR <math>\beta</math> LACTAM ALLERGY</b>	<b>GRADE OF EVIDENCE</b>
Gastroduodenal with or without entry into lumen	<b>Cefazolin</b>	Clindamycin + Aminoglycoside OR Clindamycin + Fluoroquinolone OR Vancomycin + Aminoglycoside OR Vancomycin + Fluoroquinolone	A
Small Intestine Non obstructed	<b>Cefazolin</b>	Clindamycin + Aminoglycoside OR Clindamycin + Fluoroquinolone	C
Small Intestine With Obstruction	<b>Cefazolin + Metronidazole</b> OR Cefotetan OR Cefoxitin	Metronidazole + Aminoglycoside OR Metronidazole + Fluoroquinolone	C
Appendectomy	<b>Cefazolin + Metronidazole</b> OR Cefotetan OR Cefoxitin	Clindamycin + Aminoglycoside OR Clindamycin + Fluoroquinolone OR Metronidazole + Aminoglycoside OR Metronidazole + Fluoroquinolone	A
Colorectal	<b>Cefazolin + Metronidazole</b> OR Cefotetan OR Cefoxitin OR Ceftriaxone + Metronidazole	Clindamycin + Aminoglycoside OR Clindamycin + Fluoroquinolone OR Metronidazole + Aminoglycoside OR Metronidazole + Fluoroquinolone	A
Hernia Repair	<b>Cefazolin</b>	Clindamycin OR Vancomycin	A
Open Biliary Tract	<b>Cefazolin</b> OR Cefotetan OR Cefoxitin OR Ceftriaxone	Clindamycin + Aminoglycoside OR Clindamycin + Fluoroquinolone OR Vancomycin + Aminoglycoside OR Vancomycin + Fluoroquinolone OR Metronidazole + Aminoglycoside OR Metronidazole + Fluoroquinolone	A
Laparoscopic Biliary Tract Elective Low Risk	None	None	A
Laparoscopic Biliary Tract Elective High Risk	<b>Cefazolin + Metronidazole</b> OR Cefotetan OR Cefoxitin	Clindamycin + Aminoglycoside OR Clindamycin + Fluoroquinolone OR Vancomycin + Aminoglycoside OR Vancomycin + Fluoroquinolone OR Metronidazole + Aminoglycoside OR Metronidazole + Fluoroquinolone	A
Clean Orthopaedic Surgery of Hand, Feet, Knees with NO implant of Foreign Material	None	None	C
Spine surgery with or without instrumentation	<b>Cefazolin</b>	Clindamycin OR Vancomycin	A
Hip Fracture Repair	<b>Cefazolin</b>	Clindamycin OR Vancomycin	A
Internal Fixation (plates, screws, nails)	<b>Cefazolin</b>	Clindamycin OR Vancomycin	C

## **SURGICAL ANTIMICROBIAL PROPHYLAXIS**

<b>ANTIMICROBIAL PROPHYLAXIS BY SURGERY TYPE</b>			
Joint Replacements	<b>Cefazolin</b>	Clindamycin OR Vancomycin	A
Vascular	<b>Cefazolin</b>	Clindamycin OR Vancomycin	A
Cearean Delivery	<b>Cefazolin</b>	Clindamycin + Aminoglycoside	A
Hysterectomy - vaginal or abdominal	<b>Cefazolin</b> OR Cefotetan OR Cefoxitin	Clindamycin + Aminoglycoside OR Clindamycin + Fluoroquinolone OR Vancomycin + Aminoglycoside OR Vancomycin + Fluoroquinolone OR Metronidazole + Aminoglycoside OR Metronidazole + Fluoroquinolone	A
Hysteroscopy	<b>None</b>	None	A
Thyroidectomy	<b>None</b>	None	B
Tonsillectomy Adenoidectomy Septoplasty	<b>None</b>	None	B
Breast Surgery(cancer, clean contaminated or clean with risk factors)	<b>Cefazolin</b>	Clindamycin OR Vancomycin	C

### **RECOMMENDED DOSING AND REDOSING INTERVALS FOR COMMONLY USED ANTIMICROBIALS FOR SURGICAL PROPHYLAXIS.**

ANTIMICROBIAL	ADULT DOSE IV	PEDIATRIC DOSE IV	INTR-OPERATIVE REDOSING INTERVAL (hrs)
Cefazolin	<120kg - 2 grams ≥120kg - 3 grams	30mg/kg	4
Cefotetan	2 grams	40mg/kg	6
Cefoxitin	2 grams	40mg.kg	2
Ceftriaxone	2 grams	50-75mg/kg	N/A
Clindamycin	900mg	10mg/kg	6
Ciprofloxacin	400mg	10mg/kg	N/A
Gentamycin	5mg/kg (ideal body weight)	2.5 mg/kg (Ideal body weight)	N/A
Levofloxacin	500mg	10mg/kg	N/A
Metronidazole	500mg	15mg/kg	N/A
Piperacillin-tazobactam	3.375 grams	N/A	N/A
Vancomycin	15mg/kg	15mg/kg	N/A

## **SURGICAL ANTIMICROBIAL PROPHYLAXIS**

### **REFERENCE:**

1. Clinical Practice Guidelines (2013 Revised Version)  
Developed by  
American Society of Health-System Pharmacists (ASHP),  
The Infectious Diseases Society of America (IDSA),  
The Surgical Infection Society (SIS),  
and the Society for Healthcare Epidemiology of America (SHEA)

Web access - <http://www.ashp.org/surgical-guidelines>