

Sample collection guidelines

- The success of a culture depends on the quality of the specimen submitted.
- Samples should be sent for culture prior to initiation of antimicrobial therapy.
- Unlabeled and leaking sample containers should not be sent to the laboratory.
- Incomplete or contaminated requisition forms will not be accepted.

Types of specimen for microbiological cultures

1. Blood culture
2. Cerebrospinal fluid (CSF)
3. Body fluids
4. Respiratory tract samples (Sputum, BAL, Tracheal aspirate)
5. Pus
6. Urine
7. Stool

1. BLOOD CULTURE

Important points to note:

- Volume of blood collected: most important. Bacteremia can be missed by drawing too little blood.
- **Type of Container** - Blood to be collected in designated blood culture bottles.

Ideal volume of blood required:

Age and weight	Volume of blood
Neonates to <1yr (<4kg)	0.5 to 1.5 ml. At least 1 ml
Children (<40kg)	5 to 10 ml
Adults and children (>40kg)	10 to 20 ml. At least 10-20 ml of blood divided between two blood cultures (8-10 ml each)

- Method of skin disinfection is critical. First use Povidone iodine or Tincture iodine (10%), next use Isopropyl alcohol (70%) or Chlorhexidine gluconate (2%).
- Chlorhexidine gluconate is contraindicated in neonates
- Health Care Worker should follow standard safety precautions and personal protective equipment like gloves before taking samples.
- Skin disinfection should be done in concentric circles, beginning in the center and continuing in an outward direction circularly for an area of 4-5 inches in diameter.
- Allow the disinfectant to dry before sampling.

2. CEREBROSPINAL FLUID

Type of Container – Collect CSF in a sterile leak proof container.

Important points to note:

- An initial CSF sample should be collected prior to antimicrobial therapy for highest diagnostic sensitivity.
- CSF should be submitted to laboratory as soon as possible.
- Do not refrigerate the CSF sample.
- Collect CSF in 3 parts. Send the first part to Microbiology lab for culture and sensitivity. Send the other two parts to Biochemistry (for total protein and glucose) and Hematology (cell count) respectively.
- Never send CSF samples in oxalate vials.

3. BODY FLUIDS FROM STERILE SITES

Type of container – Collect in sterile, leak proof container

Important points to note:

- Do not submit specimens from drains after they have been infused with antimicrobial agents.
- Swabs represent the least desirable sample for culture of body fluids, hence will not be accepted.
- Samples in syringes will not be accepted.
- Tips from ventricular shunts are not recommended for culture.
- Submit the specimen to laboratory as soon as possible.
- Do not refrigerate.

4. RESPIRATORY TRACT SPECIMENS (Sputum, BAL, Tracheal aspirate)

Type of container – Collect in a sterile, leak proof container.

Important points to note:

- Do not send specimens that are visually saliva only or contaminated by toothpaste or other substances.

5. PUS SPECIMENS

Important points to note:

- The more the specimen, the better it is.
- Tissues and aspirates/fluids are preferred over swabs.
- Specimens should be taken from the advancing margin of the lesion (especially for fungal infections).
- For closed wounds and aspirates, minimum volume is >1 ml.
- Viable infected tissue should be sent as sample rather than superficial debris.

6. URINE

It is extremely important that urine specimens be collected carefully avoiding urethral contamination.

Important points to note:

- Midstream clean catch urine should be collected in a sterile, wide mouth, screw capped bottle after very thorough preliminary cleaning of external genitalia with soap and water and drying adequately.
- Antiseptics should not be used for this purpose
- Urine must be transported to the lab as soon as possible preferably within one hour.
- If this is not possible, urine may be refrigerated at 4°C up to a maximum of 24 hours before plating.

7. STOOL SPECIMEN

Type of container – Clean, wide-mouth, screw-capped container

Important points to note:

- Transport to the laboratory within 2 hours.
- In case of watery stools, a delay of even half an hour can lead to loss of darting motility.
- Rectal swabs will not be accepted.
- If fecal matter is not visible on the swab, the swab should not be submitted for culture.

General Principles of Antimicrobial Use

Rational antibiotic use requires patients that receive medications appropriate to clinical needs at lowest cost in adequate doses and frequency for adequate duration.

What are the causes of irrational use of antibiotics in a healthcare setting?

- Inadequate knowledge/ information about organism, Overlapping diagnosis mimic infectious disease
- Antibiotic prescription for polypharmacy and non- bacterial infections- for fear of clinical failure and not trusting laboratory results
- Cases referred without investigations and treatment details
- Appropriate investigations not sent to identify pathogen before starting therapy
- Prophylactic therapy is extended especially in surgical prophylaxis
- Limited biomarkers availability which can distinguish between infections and inflammation like procalcitonin, beta- D- glucan and galactomannan
- When a causative organism is identified, there is failure to narrow the antibiotics
- Turnaround time for lab reports is long
- Parenteral drug combination is incorrect like vancomycin plus cloxacillin

What are the concepts to know before prescribing antibiotics?

1. Knowing the purpose for which antibiotics are needed.

In prophylactic therapy, patients are treated before they are infected to prevent infection in high risk patients such as surgery or immunocompromised state. It is a targeted therapy but narrow spectrum antibiotics are selected for limited duration only. Empiric therapy is given to patients who have sign and symptoms of infection but the causative organism is not isolated. Empiric drug is chosen based on the antibiogram isolated from our institute. This is in line with the standard international guidelines. For empiric therapy, drug of choice is the antibiotic that covers the probable organism. In definitive therapy, therapy is streamlined based on organism isolated and susceptibility report.

2. Using appropriate diagnostics to enable definitive therapy and de-escalation

Before starting antimicrobials, cultures must be emphasized. For referred patients, information must be obtained about investigations and treatment done outside.

3. Applying the pharmacokinetic and pharmacodynamic relationships of antibiotics:

Beta- lactams show time- dependent killing like penicillins, cephalosporins, carbapenems. It means longer the time drug is present in blood, more is the killing effect. Hence, to attain maximal bactericidal effect for parenteral injections, extended infusion period with more frequency is recommended. It must be balanced with half-life and stability of drug with reconstituted solutions.

Concentration dependent killing is shown by aminoglycosides and have excellent post antibiotic effect (PAE). Hence, once a day dosing is recommended for aminoglycosides.

Time- dependent concentration- enhanced killing is shown by fluoroquinolones and vancomycin. It means drug exposure above MIC is more predictive of its effects. Hence, once or twice daily dosing will produce maximum bactericidal effect with the recommended dose.

4. De-escalation

Antibiotic de-escalation is the process of streamlining empirical therapy based on laboratory or clinical response.

- Stop the antibiotic if there is no evidence of infection
- Once culture and sensitivity results are available, replace the empiric antibiotics with narrow spectrum agents
- If the initial dose is high and organism is susceptible, adjust it to the standard dose
- In overlapping spectrum of activity, discontinue the antibiotic
Target broad spectrum antibiotics and review at 48hr or earlier of initiation if possible.

5. IV to oral switch

Switch IV to oral antibiotics when patient improved clinically, tolerate oral intake and appropriate oral antibiotic is available with desirable bioavailability. The main obstacle is oral medications may not achieve same bioavailability as of IV. Early switching reduces risk of catheter related infections, thrombophlebitis, costs and may result in early discharge.

6. Diffusion into the site of action

Certain sites have poor penetration by antimicrobials like CNS, lung parenchyma, bone and necrosed tissue. In such situations, lipophilic drugs are preferred with wide volume of distribution. To attain target drug concentration, additional routes are explored in some cases. To treat resistant microorganism, routes such as inhalational and intrathecal/ intraventricular routes are explored in addition to IV route.

7. Redundant double anaerobic coverage

Oral anaerobes are mostly gram positive organism like *Peptostreptococcus* species, intestinal anaerobes are gram negative bacilli mostly like *Bacteroides*, *Prevotella*, *Fusobacterium* species. Amoxicillin/clavulanic acid, piperacillin/tazobactam, ampicillin/sulbactam, carbapenems and tigecycline have excellent anaerobic activity. In addition to the above mentioned broad spectrum antibiotics, it is redundant to add metronidazole/clindamycin.

8. Upgrading to higher antibiotics

It is advisable to identify alternative causes of inadequate response before upgrading to higher antibiotics such as incorrect dose, incorrect method of administration (check if reconstituted drug is administered within specified time limit), inadequate source control and inadequate control of confounding factors like hyperglycemia. To avoid misuse, overuse and emergence of highly resistant bugs, high end antibiotics should be used under restrictive measures or with pre- authorization.

SPECIMENS/SITES WHERE SPECIFIC ANTIBIOTICS ARE **NOT** TO BE REPORTED

SPECIMENS/SITES	DO NOT REPORT
CSF	• Agents administered via oral route only • 1st & 2nd gen. Cephalosporins and Cephameycins • Aminoglycosides • Clindamycin • Macrolides • Tetracyclines • Fluoroquinolones • Carbapenems (Doripenem, Ertapenem) • Lefamulin
URINE	• Clindamycin • Macrolides and Azithromycin • Chloramphenicol • Tigecycline
BLOOD	• Tigecycline (Primary bacteremia)
RESPIRATORY SPECIMENS	• Daptomycin • Colistin (Systemic)

Susceptible-dose dependent (SDD)

Susceptible-dose dependent (SDD) is recommended instead of "intermediate" for several drug and organism combinations for which there are multiple approved or routinely used dosing options:

- Enterobacterales: cefepime and piperacillin-tazobactam
- Staphylococcus aureus: ceftaroline
- Enterococcus faecium: daptomycin

SDD highlights the option of using higher doses or alternative dosing regimens by which to achieve a higher dose exposure for the treatment of infections caused by isolates when the minimal inhibitory concentration (MIC) or the zone diameter is in the SDD range.

Antimicrobial Agents	Breakpoints and Interpretive Categories			
	Susceptible		SDD	
	MIC	Dose	MIC	Dose
• Enterobacterales				
Cefepime	≤2 ug/mL	1 g administered every 12 h	4 ug/mL	1 g administered every 8 h or 2 g administered every 12 h
			8 ug/mL Or Zone diameter: 19-24 mm	2 g administered every 8 h (Because it is not possible to correlate specific zone diameters with specific MICs, an isolate with a zone diameter in the SDD range should be treated as if it might be an MIC of 8 ug /mL.)
Piperacillin-tazobactam	≤8/4 ug/mL	3.375-4.5 g administered every 6 h as a 30-minute infusion	16/4 ug/mL	4.5 g administered every 6 h as a 3-h infusion or 4.5 g administered every 8 h as a 4-h infusion
• Staphylococcus aureus				
Ceftaroline	≤1 ug/mL	600 mg administered every 12 h	2-4 ug/mL	600 mg every 8 h administered over 2 h
• Enterococcus faecium				
Daptomycin	N/A	N/A	≤4 ug/mL	8-12 mg/kg administered every 24 h

- Reference:
- CLSI. Performance Standards for Antimicrobial Susceptibility Testing. 33rd ed. CLSI supplement M100. Clinical and Laboratory Standards Institute; 2023.

Intrinsic Resistance

1. Enterobacterales

Organism ↓	Antimicrobial Agents →								
	AMP	AMC	A/S	TI	1GC:CZ,	CX, CTN	2GC:CXM	NF	COL
<i>Klebsiella pneumoniae</i> , <i>Klebsiella oxytoca</i>	R			R					
<i>Klebsiella aerogenes</i>	R	R	R		R	R			
<i>Enterobacter cloacae</i> complex	R	R	R		R	R			
<i>Citrobacter freundii</i>	R	R	R		R	R	R		
<i>Citrobacter koseri</i>	R			R					
<i>Serratia marcescans</i>	R	R	R		R	R	R	R	R
- Most of Morganellaceae family members (<i>Morganella</i>, <i>Proteus</i>, <i>Providencia</i> spp.) are intrinsically resistant to Ampicillin, 1GC, Tetracyclines, Tigecycline, Nitrofurantoin and Colistin, with slight variations in other groups of antibiotics. - For <i>Shigella</i> and <i>Salmonella</i> spp., Aminoglycosides, 1GC, 2GC and Cephamycins may appear active in vitro but are not effective clinically									

ABBREVIATIONS - AMP: Ampicillin, AMC: Amoxicillin Clavulanic acid, A/S: Ampicillin Sulbactam, TI: Ticarcillin, 1GC: First Generation Cephalosporins, CZ: Cefazolin, CEP: Cephalothin, CX: Cefoxitin, CTN: Cefotetan, 2GC: Second generation Cephalosporins, CXM: Cefuroxime, NF: Nitrofurantoin, COL: Colistin

2. Non- Enterobacterales

<u>Organism</u> ↓	<u>Antimicrobial Agents</u> →															
	AMP,	PI	TI	A/S	AMC	PIT	CTX	CTR	AT	IPM	MRP	ETP	COL	AG	TE, TGC	TR
<i>Acinetobacter CBC</i>	R				R				R			R				R
<i>Burkholderia cepacia complex</i>	R	R	R	R	R							R	R			
<i>Pseudomonas aeruginosa</i>	R			R	R		R	R				R			R	R
<i>Stenotrophomonas maltophilia</i>	R	R	R	R	R	R	R	R	R	R	R	R		R		R

<u>Organism</u> ↓	<u>Antimicrobial Agents</u> →						
	Ceph.	AG	CD	RP	TR	COT	FC
<i>Enterococcus faecalis</i>	R	R	R	R	R	R	R
<i>Enterococcus faecium</i>	R	R	R		R	R	R
<i>Enterococcus gallinarum/ E. casseliflavus</i>	R	R	R	R	R	R	R

- All Gram-positive bacteria are intrinsically resistant to aztreonam, polymyxin B/colistin, and nalidixic acid
- MRSA are considered resistant to other B-lactam agents, e.g., penicillin, Beta-lactam combination agents, cepheims with the exception of ceftaroline, and carbapenems.
- For *Enterococcus* spp. - cephalosporins, aminoglycosides (except for high-level resistance testing), clindamycin and cotrimoxazole may appear active in vitro but are not effective clinically.

Skin Infections

Drug	Formulation	Dosage
Mupirocin	2% cream/ointment	2-3 times daily for 10 days(MRSA nasal clearance normally after 5-7 days)
Neomycin	0.5%cream	Upto 3 times daily
Silver sulfadiazine	1% cream	Twice a day
Bacitracin-zinc	500 units/g	Upto three times a day
Retapamulin	1% ointment	Twice daily for 5 days
Fusidic acid	2% cream/ointment	3-4 times daily for 1-2 weeks
Metronidazole	0.75% & 1% gel/cream	Twice daily for 6-12 weeks
Clindamycin	1% solution (contains alcohol),1% gel	Twice daily for 6-12 weeks
Erythromycin	2% solution (contains alcohol)	Twice daily for 6-12 weeks
Tetracycline	3% solution/ cream	Twice daily for 8 weeks
Mafenide acetate	8.5% cream, 5% aqueous solution	5% solution must be applied to saturated gauge dressings
Chloramphenicol	5%,10% drops	2-3 drops 2-3 times daily
Polymyxin B+ bacitracin	Ointment (7500 IE/g polymyxin & 300 IE bacitracin	Twice daily for 2 weeks
Ciprofloxacin,Ofloxacin	0.3% solution	3 drops 2-3 times a day for 14 days

Eye Infections

Drug	Formulation	Dosage
Azithromycin	1.5% single use drops	One drop twice daily for 3 days
Chloramphenicol	0.5% drops (single & multi dose)	2 drops every 3 h
Ciprofloxacin	0.3% drops/ointment	Drops:1-2 drops q.i.d (2 hourly for 1 st 2 days if severe); continue upto 21 days Ointment:1.25 cm t.d.s daily for 2 days, then twice daily for 5 days or longer
Fusidic acid	1% drops	1 drop twice daily
Gentamicin	0.3% drops	1 or 2 drops upto 6 times daily (every 15-20 mins in severe infection)
Levofloxacin	0.5% drops (single & multi dose)	2 hourly upto 8 times daily fo first 2 days & then 4 times daily for 3 days
Moxifloxacin	0.5% drops Intravitreal 400µg/0.1 ml	1 drop three times daily usually for 7-8 days
Ofloxacin	0.3 drops	Every 2-4 h for 2 days & then 4 times daily for 10 days
Tobramycin	0.3% drops	Twice daily for 6-8 days (4 times if severe infection) then daily for 5-7 days

Anaerobic coverage of commonly used antibiotics	
ACTIVITY	ANTIBIOTICS
Nearly always active	Metronidazole, Carbapenems, BL-BLI, Chloramphenicol
Usually active	Clindamycin, Cephamycins
Variable activity	Penicillin, Vancomycin, Macrolides, Newer generation of Fluoroquinolones, Tigecycline
Poor/No anaerobic activity	Aminoglycosides, Cotrimoxazole, Aztreonam

PK-PD Properties of antibiotics

	PK-PD kill characteristics		
	Time dependent	Concentration dependent	Concentration dependent with time dependence
Antibiotic	Penicillin Cephalosporins Carbapenems Natural macrolides Clindamycin Oxazolidinone	Aminoglycosides Fluoroquinolones Fosfomycin Colistin Metronidazole Daptomycin	Aminoglycosides Fluoroquinolones Fosfomycin Colistin Glycopeptides Synthetic macrolides Tetracyclines and Glycylcyclines Oxazolidinones
Optimal PK-PD index	%T>MIC	$C_{\max}/MIC$	AUC_{0-24}/MIC
Objective	Maximize duration of exposure	Maximize concentration	Maximize duration and concentration of drug exposure
Measures	Frequent administration or prolonged infusion dosing	Infrequent (once daily) administration of high doses	Administration of high total daily dose
T – Time; $C_{\max}$ – Maximum. Concentration; MIC – Minimum Inhibitory Concentration; AUC – Area Under Curve			

PENICILLIN G (ICMR)	PENICILLIN V- Adult dose- 500mg BD PENICILLIN G - Adult Dose : Low Dose: 0.6 to 1.2 MU q 4 hrs IM per day High Dose: 20 -40 lac Units IV q 4 hourly (For meningococcal meningitis, the administration should be done q 2h Pediatric Dose: 150,000-300,000units/kg/day (divided in 4-6 doses)
AMPICILLIN (ICMR)	Adult Dose- 2 g 4 hourly (total 12 g/day) Pediatric Dose- 200mg/kg/day (divided in 3-4 doses) For Meningitis: 300-400mg/kg/day
CEFUROXIME	PGI- 1.5 gm q8h Acute uncomplicated cystitis in women- 250 mg BD oral ICMR- IV Adult Dose- 750 mg 8 hourly Serious infections : 1.5 g 8 hourly Pediatric Dose- 30-100 (60 mg/kg/day) in three divided doses
CEFTRIAZONE	SANFORD- 1 – 2 g IV q24h Endovascular/osteomyelitis/PJI: 2 g IV q24h Meningitis, <i>E. faecalis</i> endocarditis: 2 g IV q12h PGI- Tropical Febrile Illness, Enteric fever, Native Valve Endocarditis, Septic cavernous sinus thrombosis- 2 g/IV/BD (7 days) Acute Bloody Diarrhea Bacillary Dysentery (Presumed/ Proven Shigella)- 1 g IV BD(5 days)
CEFOTAXIME (ICMR)	Adult Dose- Usual dose: 1 g 8 hourly Severe infections (Meningitis): 2 g 4- 8 hourly Pediatric Dose- 100 mg/kg/day in 3-4 divided doses Meningitis: 150mg/kg/day
CEFTAZIDIME (PGI)	1-2 g IV q8h infused over 30 minutes Anti-pseudomonal dosing: 2 gm IV q8hr
CEFEPIME (ICMR)	Adult Dose- Usual dose: 2 g 12 hourly Severe infections: 2 g 8 -12 hourly Pediatric Dose- 100- 150 mg/kg/day in three divided doses
Ceftaroline (IV) SANFORD (SHC Restriction)	General 600 mg IV q12h Endocarditis/ <i>S.aureus</i> bacteremia, Susceptible-dose dependent (SDD) 600 mg IV q8h administered over 2-hr
CEFIXIME (GMCH)	Adult dose- Oral- 400mg daily divided every 12-24 hours Pediatric dose- Oral- 8mg/kg/ day divided every

	12-24 hours.
AMPICILLIN SULBACTAM (SANFORD)	Mild/uncomplicated 1.5 g IV q6h Systemic 3 g IV q6h Acinetobacterbaumannii For more resistant Acinetobacterbaumannii infections, consider higher dosing regimens 3 g IV q4h
AMOXYCILLIN- CLAVULANIC ACID (ICMR)	ICMR Adult Dose-1 gm twice daily/ 625 mg thrice daily oral 1.2 gm IVq8h Pediatric Dose- 15-20 mg/kg of amoxicillin twice daily PO 25-30 mg/kg of amoxicillin component thrice daily IV PGI- 500/125 mg PO q8h 875/125 mg PO q12h IV – 1.2 g IV TDS
PIPERACILLIN-TAZOBACTAM (SANFORD)	Intermittent Dosing (30-minutes) General -3.375 g IV Severe/sepsis/CF/ nosocomial PNA -4.5 g IV q6h Extended-Infusion Dosing (4-hr infusion) General, CF Pseudomonas, nosocomial PNA:- 3.375 – 4.5 g IV q8h over 4h
IMIPENEM (PGI)	500 mg IV q6h/ 1000 mg IV q8h (based on imipenem, not inclusive of cilastatin dose) infusion time: 2 to 3 h Sepsis & Septic Shock- 1g IV TID CNS infections (HIV)- 500mg IV TID UTI (complicated)- 1g IV TID
MEROPENEM (ICMR)	Adult Dose- 1 gm thrice daily IV 2gm thrice daily IV (for Meningitis) Pediatric Dose-20-40 mg/kg thrice daily
VANCOMYCIN (PGI)	Standard: 15-20 mg/kg IV q8h or 500 mg q6h if taking weight is not possible Consider loading dose in critically ill patients of 25 mg/kg x1dose (For specific infections, recommended standard guidelines are that of 1g IV BD) Native/ Prosthetic Valve Endocarditis- 15mg/Kg/IV BD Clostridium difficile- 125 mg QID oral.
GENTAMICIN (PGI)	Traditional dosing 1.5-2.5 mg/kg IV q8h Monitoring of serum levels is recommended Target trough concentration 2 mg/l Native valve endocarditis- 3mg/kg IV q 24hrly Tubo ovarian abscess, chorioamnionitis- 3-5 mg/kg OD IV
AMIKACIN SULPHATE INJ. (ICMR)	Adult Dose- 15 mg/kg IV OD. Dosing beyond 48 hours should be accompanied by determination of peak levels done after 1 hr of dosing (56-64mcg/ml), and trough concentration (<1mcg/ml) Ideal body weight (IBW) should be used for dose calculation

	Pediatric Dose (GMCH 32)- IM/ IV 15-20 mg/kg/ dose every 24 hours.
DOXYCYCLINE (ICMR)	Adult Dose - 100 mg twice daily Pediatric Dose - 2-4mg/kg/day divided in two doses Now considered safe for shorter duration (< 21 days)
MINOCYCLINE (ICMR)	Adult Dose Usual Dose: 200mg IV loading dose and then 100mg IV BD High Dose: 200mg IV BD
TIGECYCLINE (ICMR)	Adult Dose 100 mg IV stat followed by 50 mg 12 hourly Child Pugh Class C- 100 mg IV loading dose followed by 25 mg 12 hourly For hospital acquired infections or <i>Acinetobacter</i> , 200 mg IV stat, followed by 100 mg IV q12h Pediatric Dose 2.4mg/kg as loading dose and then 1.2mg/kg/dose two times a day
CHLORAMPHENICOL	Adult dose- IV- 50-100mg/kg/day in divided doses every 6 hours.(Maximum daily- 4g/day) Pediatric dose- IV- 12.5mg/kg/dose every 6 hours.
ERYTHROMYCIN (PGI)	PO: 250-500 mg PO q6-12h IV: 15- 20 mg/kg/day IV divided q6- 8h Erysipelas- 250mg BD Carbuncle,furuncle, balanitis- 500mg QID (7-10 days)
AZITHROMYCIN (PGI)	Enteric fever- <i>Salmonella typhi</i> Uncomplicated: Tablet Azithromycin 1 g orally once then 500 mg orally daily OR 1 g orally once daily (5 to 7 days). Combination with azithromycin should be tried for a patient on ceftriaxone who does not respond to 4-7 days of ceftriaxone. Acute exacerbation of COPD, Community acquired Pneumonia - Azithromycin 500 mg OD (3 days) Acne vulgaris -Oral Azithromycin 500 mg OD (3 days/week for 6-8 weeks) Acute watery Diarrhea, Profuse (Cholera suspected) Azithromycin 1 g single dose Pelvic inflammatory disease -For those who cannot tolerate doxycycline, azithromycin is an option. 500 mg once followed by 250 mg OD 7 days Urethritis - N. gonorrhoeae , C. trachomatis, M. genitalium Gonococcal: Ceftriaxone (250mg IM)Plus Azithromycin(1g oral) Alternative regimen: Cefixime (400mg oral) Plus

	Azithromycin(1g oral) Non gonococcal: Doxycycline (100mg BD)or Azithromycin(1g oral) Prostatitis Acute: Ceftriaxone(1 g IM) Plus Azithromycin (1 g oral)Single dose Blepharitis- Oral Azithromycin 500 mg on D1 f/b 250 mg for 4 days (5 days) Chlamydial keratoconjunctivitis (Trachoma) - Systemic Azithromycin -20 mg/kg (Max: 1g) Single dose.
CLINDAMYCIN (ICMR)	Adult Dose Usual dose: 600-900 mg every 8 hourly Oral dose: 300 mg three-four times a day
LINEZOLID (PGI)	Vancomycin resistant <i>Enterococcus</i> :- 600 mg IV or orally BD
CIPROFLOXACIN (SANFORD)	General infections- 400 mg IV q12h, 500 mg PO q12h <i>Pseudomonas</i>, severe - 400 mg IV q8h 750 mg PO q12h
LEVOFLOXACIN INJECTABLE (ICMR)	Adult Dose: 500-750 mg OD Pediatric Dose: 10-15 mg/kg in one or two divided doses PO or IV
NITROFURANTOIN (PGI)	Asymptomatic bacteriuria, acute cystitis, uncomplicated cystitis- 100mg oral BD (5days)
Trimethoprim (TMP)/ Sulfamethoxazole (IV/PO) (SANFORD)	Uncomplicated cystitis: 1 DS tab PO BID SSTI: 1 – 2 DS tab PO BID <i>S. aureus (Bone/Joint):</i> 8-10 mg/kg/day TMP in divided doses (2 DS tabs PO BID) Gram-negative bacteremia: 8-10 mg/kg/day TMP in divided doses (2 DS tab PO BID) <i>Stenotrophomonas</i>: 10-15 mg/kg/day TMP divided q8-12h
COLISTIN (ICMR)	ColistimethateInj Adult Dose- Loading dose of 9-12 million unit (MU) followed by 4.5mu q12h Nebulized Colistin: 1-4 million units, q8-12 hourly Intrathecal/ventricular dose of colistin: 125,000 IU/day Pediatric Dose- Loading Dose: 1.2lacsIU/Kg Maintenance dose: Same as loading in two divided doses

ICU

Blood stream infections (BSI)		
NICU (Total no. of isolates= 41)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Acinetobacter</i> species (n=18)	44	Minocycline (78%)/Cotrimoxazole (61%)/ Ceftazidime (50%)/ Tetracycline (40%)/ Piperacillin-tazobactam (33%)
<i>Staphylococcus</i> species(n=12)	29	Linezolid (=Doxycycline) (100%)/ Cotrimoxazole (=Ceftazidime) (75%)/ Gentamicin (58%)
<i>Klebsiella</i> species(n=9)	22	Piperacillin-tazobactam (=Cotrimoxazole) (22%)/ Ampicillin (=Ciprofloxacin=Amikacin=Imipenem) (11%)
<i>Pseudomonas</i> species(n=1)	2.5	Piperacillin-tazobactam (=Imipenem= Aztreonam=Amikacin=Ceftazidime) (100%)
<i>Escherichia coli</i> (n=1)	2.5	Colistin (100%)

ICU

Blood stream infections (BSI)		
ADULT ICU (Total no. of isolates= 84)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Klebsiella</i> species(n=30)	36	Amikacin (30%)/ Piperacillin-tazobactam (17%)/ Ciprofloxacin (=Imipenem) (13%)/ Ceftazidime (3%)
<i>Acinetobacter</i> species(n=21)	25	Minocycline (48%)/ Cotrimoxazole (24%)/ Gentamicin (19%)/ Ciprofloxacin (=Amikacin) (14%)
<i>Staphylococcus</i> species(n=19)	22	Linezolid (100%)/ Doxycycline (84%)/ Cotrimoxazole (68%)/ Gentamicin (58%)/ Ciprofloxacin(=Clindamycin) (42%)
<i>Pseudomonas</i> species(n=5)	6	Piperacillin-tazobactam (=Imipenem) (60%)/ Aztreonam (=Amikacin=Ceftazidime=Ciprofloxacin) (40%)
<i>Enterococcus</i> species(n=5)	6	Linezolid (100%)/ Vancomycin (80%)
<i>Escherichia coli</i> (n=4)	5	Cotrimoxazole (50%)/ Amikacin (=Piperacillin-tazobactam=Ciprofloxacin=Cefepime) (25%)
Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
Send sample for culture	Send sample for culture	Send sample for culture
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
1) Ampicillin-Sulbactam/Amoxicillin-clavulanic acidulanate 2) Ceftriaxone 3) Ciprofloxacin	1) Piperacillin-tazobactam± Amikacin/Ciprofloxacin ± Vancomycin/Teicoplanin (if MRSA) 2) If <i>Acinetobacter</i> , consider Ampicillin-Sulbactam 3) Add Vancomycin/Teicoplanin if MRSA otherwise consider Doxycycline/Gentamicin/Clindamycin/Co trimoxazole	1) Imipenem/Meropenem ±Piperacillin-tazobactam/ Ampicillin-Sulbactam (If <i>Acinetobacter</i>) 2) If MRSA, consider Vancomycin/Teicoplanin
After Culture Report Continue Treatment	After Culture Report Continue Treatment	After Culture Report Continue Treatment
Susceptible bugs: Continue treatment	ESBL +ve <i>Klebsiella</i> / <i>E.coli</i> : Continue treatment with monotherapy (Group 1 Carbapenem is preferable, avoid using broad spectrum anti-pseudomonal drugs)	Susceptible <i>Pseudomonas</i> / <i>Acinetobacter</i> /MRSA: Continue treatment as monotherapy
Step down “De-escalate”	Step down “De-escalate”	Step down “De-escalate”
Continue monotherapy	If susceptibility pattern improves, consider de-escalation (to oral drugs)	If susceptibility pattern improves, consider de-escalation (to oral drugs)
Consider Escalation	Consider Escalation	Consider Escalation
1) ESBL+veEnterobacterales/MRSA: Escalate and treat as patient type 2 including <i>Salmonella</i> . 2) <i>Pseudomonas</i> and <i>Acinetobacter</i> : Escalate and treat as patient type 3	1) If susceptibility results show MDR/XDR, then escalate and treat like type 3 2) For MRSA, add Vancomycin or Teicoplanin	1) If Carbapenemase producer, consider Colistin in combination or if OXA-48, consider Ceftazidime/Avibactam + Aztreonam. Consult microbiologist before starting the above. 2) If VRE, then consider Linezolid/Daptomycin (Don't give Daptomycin in case of respiratory etiology)

* Vancomycin in *S.aureus* should be tested by MIC Method

** Colistin/Polymyxin B should be tested by MIC Method

Respiratory Tract Infections		
ADULT ICU (Total no. of isolates= 159)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Acinetobacter</i> species (n=75)	47	Minocycline (52%)/ Cotrimoxazole (20%)/ Tetracycline (=Gentamicin) (9%)/ Tobramycin (6%)
<i>Klebsiella</i> species(n=30)	24	Amikacin (24%)/ Imipenem (46%)/Cotrimoxazole (16%)/ Ciprofloxacin (14%)
<i>Pseudomonas</i> species(n=29)	18	Amikacin (=Aztreonam=Gentamicin=Ceftazidime) (69%)/ Ciprofloxacin (66%)/ Imipenem (62%)
<i>Escherichia coli</i> (n=13)	8	Amikacin (54%)/ Imipenem (46%)/ Cotrimoxazole(15%)/ Ciprofloxacin (= Ceftazidime=Cefepime)(8%)
<i>Staphylococcus</i> species(n=5)	3	Linezolid (100%)/ Clindamycin (=Cotrimoxazole=Docyclyline) (80%)/ Gentamicin (60%)/ Ciprofloxacin (40%)
Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
Send sample for culture	Send sample for culture	Send sample for culture
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
Macrolide (Clarithromycin/Erythromycin) Respiratory fluoroquinolone (Moxifloxacin, Gemifloxacin or Levofloxacin*) Cefotaxime, Ceftriaxone Ampicillin-Sulbactam or Amoxicillin-clavulanic acid Ertapenem	1) Imipenem/Piperacillin-tazobactam/Amikacin ± Vancomycin/Teicoplanin (if MRSA) 2) If <i>Acinetobacter</i> , then consider high dose Sulbactam. • Daptomycin is contraindicated in Respiratory Tract Infection	1) Colistin/Minocycline/Imipenem ± Amikacin 2) If MRSA, consider Vancomycin/Teicoplanin
After Culture Report Continue Treatment	After Culture Report Continue Treatment	After Culture Report Continue Treatment
Non ESBL Enterobacterales, Continue treatment with Macrolide or Fluoroquinolone	ESBL Positive Enterobacterales, Continue treatment	MDR <i>Pseudomonas/Acinetobacter</i> : Continue treatment
Step down “De-Escalate”	Step down “De-Escalate”	Step down “De-Escalate”
Use Monotherapy	Non ESBL Enterobacterales: De-escalate & Treat as patients Type 1	Susceptible <i>Pseudomonas aeruginosa/ Acinetobacter</i> : Imipenem, Meropenem, Piperacillin-tazobactam + Ciprofloxacin/Levofloxacin, or β-lactam + Aminoglycoside and Azithromycin or β-lactam + Aminoglycoside & an anti-pneumococcal fluoroquinolone CA-MRSA: Add Vancomycin/Linezolid ESBL +veEnterobacterales, de-escalate to patient Type 2
Consider Escalation	Consider Escalation	Consider Escalation
ESBL +ve <i>Klebsiella</i> , Treat as Patients Type 2	<i>Pseudomonas/Acinetobacter</i> : Escalate and treat as Patient Type 3	1) If Carbapenemase producer, consider Colistin in combination or if OXA-48, consider Ceftazidime/Avibactam + Aztreonam. Consult microbiologist before starting the above. 2) If VRE, then consider Linezolid. 3) MDR: <i>Pseudomonas/Acinetobacter</i> : Use triple drug combination of Colistin+Imipenem + Sulbactam/Rifampicin

* Daptomycin is contraindicated in Respiratory Tract Infection

Urinary Tract Infections		
ADULT ICU (Total no. of isolates= 71)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Klebsiella</i> species(n=29)	41	Ciprofloxacin (13%)/ Amikacin (10%)/ Piperacillin-tazobactam (9%)/ Imipenem (7%)
<i>Escherichia coli</i> (n=16)	23	Fosfomycin (100%)/ (Amikacin) (63%)/ Cefepime (13%)/ Ciprofloxacin (25%)/ Cotrimoxazole (19%)
<i>Enterococcus</i> species(n=13)	18	Linezolid (100%)/ Fosfomycin (91%)/ Nitrofurantoin (36%)/ Ampicillin (15%)
<i>Acinetobacter</i> species(n=21)	10	Minocycline (57%)/ Fosfomycin (40%)/Tetracycline (20%)/Ciprofloxacin (14%)/
<i>Pseudomonas</i> species(n=5)	7	Aztreonam (=Ciprofloxacin) (40%)/ Amikacin (=Ceftazidime=Imipenem) (20%)
<i>Staphylococcus</i> species(n=1)	1	Linezolid (=Nitrofurantoin) (100%)
Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
<i>Send sample for culture</i>	<i>Send sample for culture</i>	<i>Send sample for culture</i>
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
Ampicillin/Sulbactam Ticarcillin/Clavulanic acid/CefSul Norfloxacin/Ofloxacin/Ciprofloxacin Nitrofurantoin Cefuroxime	Amikacin/Piperacillin-tazobactam/Cefoperazone-Sulbactam First consider oral therapy, if patient is unable to take, then switch to parenteral therapy.	1) Imipenem/Meropenem ± Amikacin 2) Consider IV Fosfomycin above or in combination 3) If MRSA, consider Vancomycin/Linezolid
After Culture Report: Continue Treatment	After Culture Report: Continue Treatment	After Culture Report: Continue Treatment
Non ESBL Enterobacterales, use susceptible antibiotic	ESBL +veEnterobacterales, continue treatment based on antibiotic sensitivity	Susceptible <i>Pseudomonas</i> / <i>Acinetobacter</i> : Continue with Imipenem (or Meropenem)/Levofloxacin/Amikacin CA-MRSA/ <i>Enterococcus</i> : Add Vancomycin or Linezolid
Step down “De-Escalate”	Step down “De-Escalate”	Step down “De-Escalate”
Continue monotherapy	If susceptibility pattern improves, consider de-escalation (with oral drugs)	If susceptibility pattern improves, consider de-escalation (with oral drugs)
Consider Escalation	Consider Escalation	Consider Escalation
ESBL+ve: Escalate and treat as Patient Type 2	If MDR/XDR, then escalate & treat like Type 3.	1) If Carbapenemase producer, consider Colistin in combination or if OXA-48, consider Ceftazidime/Avibactam + Aztreonam. Consult microbiologist before starting the above. 2) If VRE, then consider Linezolid. 3) MDR: <i>Pseudomonas</i> / <i>Acinetobacter</i> : Use triple drug combination of Colistin+Imipenem + Sulbactam/Rifampicin

* Avoid Ciprofloxacin and Levofloxacin since they have potent antipseudomonal activity

** Tigecycline does not get excreted in urine, therefore it is not a treatment of choice for UTI due to ESBL producing *E.coli*.

*** *Enterococci* susceptible to penicillin are predictably susceptible to ampicillin, amoxicillin, ampicillin-sulbactam, amoxicillin-clavulanate and piperacillin-tazobactam for non-beta lactamase producing *Enterococci*.

ICU

PUS

NICU (Total no. of isolates= 6)

Most Common Pathogen	%	Antibiotics Susceptibility
<i>Pseudomonas</i> species(n=3)	50	Amikacin (= Ceftazidime=Ciprofloxacin=Aztreonam=Gentamicin=Piperacillin-tazobactam) (100%) / Imipenem (67%)
<i>Klebsiella</i> species(n=2)	33	Colistin (100%)
<i>Escherichia coli</i> (n=1)	17	Colistin (100%)

PUS
ADULT ICU (Total no. of isolates= 131)

Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=41)	31	Amikacin (68%)/ Piperacillin-tazobactam (=Imipenem) (42%)/ Cotrimoxazole (22%)/ Ceftazidime (17%)/ Ciprofloxacin (15%)
<i>Klebsiella</i> species(n=37)	28	(Amikacin)(=Imipenem) (41%)/ Cotrimoxazole (=Ciprofloxacin) (22%)/ Ceftazidime (8%)
<i>Acinetobacter</i> species(n=20)	15	Minocycline (63%)/ Tetracycline (14%)/ Cotrimoxazole (10%)/ Tobramycin (5%)
<i>Pseudomonas</i> species(n=13)	10	Gentamicin (69%) / Amikacin (=Ciprofloxacin) (62%) / Aztreonam (=Imipenem) (54%) / Ceftazidime (46%)
<i>Staphylococcus</i> species(n=10)	8	Linezolid (100%)/ Gentamicin (70%) / Cotrimoxazole (60%) / Doxycycline (50%) / Clindamycin (40%)
<i>Enterococcus</i> species(n=10)	8	Linezolid (91%) / Vancomycin (73%) / Doxycycline (9%)
Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
Send sample for culture	Send sample for culture	Send sample for culture
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
Nafcillin/Oxacillin/Dicloxacillin/Amoxicillin-Clavulanate Cefazolin/Cephalexin Clindamycin Doxycycline/Minocycline TMP-SMZ MRSA SSTI: Vancomycin Linezolid* Clindamycin Daptomycin Doxycycline/Minocycline TMP-SMZ	Ertapenem/Amikacin/Piperacillin-tazobactam/Cefoperazone-Sulbactam If MRSA: Vanomycin/Teicoplanin/Linezolid First consider oral therapy, if patient is unable to take, then switch to parenteral therapy.	Vancomycin (or Teicoplanin) + Imipenem (or Meropenem)
After Culture Report: Continue Treatment	After Culture Report: Continue Treatment	After Culture Report: Continue Treatment
MSSA: Continue treatment	ESBL +veEnterobacterales, continue treatment based on antibiotic sensitivity	<i>Enterococcus/Pseudomonas/Acinetobacter</i> detected: Continue the treatment
Step down “De-Escalate” MSSA: Continue monotherapy	Step down “De-Escalate” ESBL -veEnterobacterales: De-escalate and treat as patient Type 1 <i>Enterococcus</i> : use Tigecycline/ Vancomycin	Step down “De-Escalate” ESBL +veEnterobacterales: De-escalate to Patient Type 2 <i>Enterococcus</i> : De-escalate to Tigecycline/Vancomycin
Consider Escalation	Consider Escalation	Consider Escalation
ESBL+ve: Escalate and treat as Patient Type 2 MRSA: Add Vancomycin or Teicoplanin	<i>Pseudomonas</i> +ve: Escalate and treat as Patient Type 3	MDR <i>Pseudomonas/Acinetobacter</i> : Escalate to Colistin + Imipenem + Sulbactam combination

*Linezolid is a reserved drug for inpatients

**Sulbactam has anti-Acinetobacter activity

***Tigecycline should not be used in *Pseudomonas* and *Proteus* infection

WARDS

Blood stream infections (BSI)		
MEDICINE WARD (Total no. of isolates= 224)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=103)	46	Linezolid (100%)/ Doxycycline (81%)/ Clindamycin (70%)/ Gentamicin (66%)/ Cotrimoxazole (57%)
<i>Acinetobacter</i> species(n=56)	25	Minocycline (70%)/ Gentamicin (=Tobramycin=Ciprofloxacin=Cotrimoxazole) (38%)/ Tetracycline (=Ampicillin-Sulbactam) (35%)/ Amikacin (34%)
<i>Escherichia coli</i> (n=26)	12	Imipenem (77%)/ Amikacin (73%)/ Piperacillin-tazobactam (62%)/ Ciprofloxacin (=Cotrimoxazole) (31%)/ Ceftazidime (27%)
<i>Klebsiella</i> species(n=18)	8	Amikacin (50%)/ Cotrimoxazole (44%)/ Piperacillin-tazobactam (=Imipenem=Ciprofloxacin) (39%)/
<i>Enterococcus</i> species(n=16)	7	Linezolid (100%)/ Vancomycin (94%)/ Ampicillin (13%)/ Penicillin 98%)
<i>Pseudomonas</i> species(n=5)	2	Ciprofloxacin(=Pipitaz) (100%)/ Ceftazidime (=Imipenem) (80%)/ Gentamicin (=Amikacin) (60%)

Blood stream infections (BSI)		
SURGERY WARD (Total no. of isolates= 66)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=20)	30	Linezolid (100%)/ Doxycycline (85%)/ Gentamicin (75%)/ Clindamycin (55%)/ Ciprofloxacin (40%)
<i>Klebsiella</i> species(n=18)	27	Amikacin (39%)/ Imipenem (=Ciprofloxacin) (22%)/ Ceftazidime (=Cotrimoxazole=Piperacillin-tazobactam) (11%)
<i>Acinetobacter</i> species(n=14)	21	Minocycline (50%)/ Ciprofloxacin (=Cefepime=Piperacillin-tazobactam=Amikacin=Imipenem) (21%)/ Tetracycline (20%)
<i>Enterococcus</i> species(n=7)	11	Vancomycin (=Linezolid) (100%)/ Ampicillin (57%)/ Penicillin (50%)/ Doxycycline (=Tetracycline=Ciprofloxacin) (43%)
<i>Escherichia coli</i> (n=5)	8	Amikacin (60%)/ Imipenem (40%)/ Cefepime (Ciprofloxacin=Cotrimoxazole=Ampicillin) (20%)
<i>Pseudomonas</i> species(n=2)	3	Ciprofloxacin (=Imipenem=Ceftazidime=Piperacillin-tazobactam) (50%)

Blood stream infections (BSI)		
ORTHOPAEDICS WARD (Total no. of isolates= 16)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=7)	44	Linezolid (100%)/ Doxycycline (86%)/ Ciprofloxacin 971%)/ Gentamicin (=Clindamycin=Cotrimoxazole) (57%)
<i>Acinetobacter</i> species(n=4)	25	Minocycline (100%)/ Amikacin (=Tobramycin=Ampicillin=Cefepime=Ceftazidime=Ciprofloxacin=Cotrimoxazole) (50%)/
<i>Klebsiella</i> species(n=3)	19	Amikacin (=Cotrimoxazole) (67%)/ Ciprofloxacin (=Imipenem) (33%)
<i>Enterococcus</i> species(n=1)	6	Vancomycin (=Linezolid=Ampicillin) (100%)
<i>Pseudomonas</i> species(n=1)	6	Ciprofloxacin (=Imipenem=Ceftazidime=Piperacillin-tazobactam=Gentamicin) (100%)

Blood stream infections (BSI)		
PAEDIATRICS WARD (Total no. of isolates= 170)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=100)	59	Linezolid (100%)/ Doxycycline (83%)/ Gentamicin (79%)/ Cotrimoxazole (76%)/ Clindamycin (73%)/ Ciprofloxacin (53%)
<i>Enterococcus</i> species(n=28)	16.5	Linezolid (100%)/ Vancomycin (86%)/ Tetracycline (=Doxycycline) (57%)/ Ampicillin (54%)
<i>Acinetobacter</i> species(n=16)	9	Minocycline (56%)/ Tetracycline (53%)/ Ampicillin-Sulbactam (47%)/ Tobramycin (33%)/ Amikacin (=Cefepime) (25%)
<i>Escherichia coli</i> (n=12)	7	Amikacin (83%)/ Imipenem (58%)/ Cotrimoxazole (46%)/ Piperacillin-tazobactam (42%)/ Ciprofloxacin (25%)
<i>Klebsiella</i> species(n=6)	3.5	Amikacin (33%)/ Imipenem (=Piperacillin-tazobactam=Cotrimoxazole) (17%)
<i>Pseudomonas</i> species(n=5)	3	Ceftazidime (80%)/ Ciprofloxacin (Amikacin=Imipenem=Gentamicin=Aztreonam) (60%)
<i>Salmonella</i> species(n=3)	2	Ampicillin (=Azithromycin=Ceftriaxone=Chloramphenicol=Ciprofloxacin=Imipenem) (100%)

Blood stream infections (BSI)		
OBSTETRICS AND GYNAECOLOGY WARD (Total no. of isolates= 22)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=13)	59	Linezolid (100%)/Gentamicin (85%)/ Doxycycline (77%)/ Cotrimoxazole (69%)/ Clindamycin (62%)
<i>Klebsiella</i> species(n=4)	18	Piperacillin-tazobactam (=Amikacin=Imipenem=Ciprofloxacin) (50%)/ Cotrimoxazole (=Ceftazidime=Cefepime) (25%)
<i>Acinetobacter</i> species(n=4)	18	Tetracycline (100%)/ Minocycline (75%)/ Ciprofloxacin (=Amikacin) (50%)/ Ampicillin-Sulbactam (=Cefepime) (33%)
<i>Pseudomonas</i> species(n=1)	5	Ciprofloxacin (=Imipenem=Ceftazidime=Piperacillin-tazobactam) (100%)

Blood stream infections (BSI)		
NEONATOLOGY WARD (Total no. of isolates= 65)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=27)	41.5	Linezolid (100%)/ Gentamicin (=Clindamycin) (78%)/ Doxycycline (67%)/ Cotrimoxazole (46%)/ Ciprofloxacin (41%)
<i>Acinetobacter</i> species(n=20)	31	Tetracycline (67%)/ Minocycline (40%)/ Cotrimoxazole (33%)/ Tobramycin (27%)/
<i>Klebsiella</i> species(n=12)	18.5	Amikacin (=Piperacillin-tazobactam=Imipenem=Ciprofloxacin) (42%)/ Cotrimoxazole (25%)
<i>Escherichia coli</i> (n=6)	9	Imipenem (=Piperacillin-tazobactam) (83%)/ Amikacin (67%)/ Cotrimoxazole (50%)/ Ciprofloxacin (35%)/

Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
<i>Send sample for culture</i>	<i>Send sample for culture</i>	Send sample for culture
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
1) Oral: Cefixime/Cefpodoxime or Ofloxacin or Amoxicillin-Clavulanate 2) IV/IM: Ceftriaxone/Cefotaxime or Amoxicillin-Clavulanate or Ciprofloxacin	1) Oral: Cefixime/Cefpodoxime or Ofloxacin/Ciprofloxacin or Amoxicillin-Clavulanate or Azithromycin 2) IV/IM: Meropenem or Piperacillin-Tazobactam + Amikacin	3) Imipenem/Meropenem ±Piperacillin-tazobactam/ Ampicillin-Sulbactam (If Acinetobacter) 4) If MRSA, consider Vancomycin/Teicoplanin
After Culture Report Continue Treatment	After Culture Report Continue Treatment	After Culture Report Continue Treatment
Susceptible bugs: Continue treatment	ESBL +ve <i>Klebsiella</i> / <i>E.coli</i> : Continue treatment with monotherapy	Susceptible <i>Pseudomonas</i> / <i>Acinetobacter</i> /MRSA: Continue treatment as monotherapy
Step down “De-escalate”	Step down “De-escalate”	Step down “De-escalate”
Use monotherapy	If susceptibility pattern improves, consider de-escalation (to oral drugs)	If susceptibility pattern improves, consider de-escalation (to oral drugs)
Consider Escalation	Consider Escalation	Consider Escalation
ESBL+ve Enterobacterales/MRSA: Escalate and treat as patient type 2 including <i>Salmonella</i> .	1) If susceptibility results show MDR/XDR, then escalate and treat like type 3 2) For MRSA, add Vancomycin or Teicoplanin	1) MDR- <i>Pseudomonas aeruginosa</i> or <i>Acinetobacter</i> : Continue 3 drug combination, Colistin + Imipenem + Sulbactam 2) VRE/VRSA: Escalate to Linezolid/ Daptomycin

**Staphylococcus* species may not be the true pathogen.

**Taking aseptic precautions while blood collections is essential.

WARDS

Urinary TractInfections (UTI)		
MEDICINE WARD (Total no. of isolates= 479)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=323)	68	Fosfomycin (95%)/ Nitrofurantoin (84%)/ Amikacin (75%)/ Imipenem (63%)/ Piperacillin-tazobactam (54%)
<i>Klebsiella</i> species(n=70)	15	Amikacin (49%)/ Nitrofurantoin (=Imipenem) (41%)/ Piperacillin-tazobactam (44%)/ Ciprofloxacin (20%)/ Ceftazidime (=Cefepime) (16%)
<i>Enterococcus</i> species(n=45)	9	Linezolid (98%)/ Fosfomycin (97%)/ Vancomycin (82%)/ Nitrofurantoin (36%)/ Tetracycline (13%)
<i>Pseudomonas</i> species(n=26)	5	Imipenem (42%)/ Gentamicin (=Amikacin) (38%)/ Aztreonam (=Piperacillin-tazobactam=Ciprofloxacin) (35%)
<i>Staphylococcus</i> species(n=9)	2	Linezolid (=Nitrofurantoin=Clindamycin) (100%)/ Cotrimoxazole (89%)/ Gentamicin (67%)/ Tetracycline (60%)/ Doxycycline (56%)
<i>Acinetobacter</i> species(n=6)	1	Minocycline (78%)/ Fosfomycin (60%)/ Tetracycline (50%)/ Piperacillin-tazobactam(=Ceftazidime) (44%)/ Ampicillin-Sulbactam (43%)/ Imipenem (=Amikacin=Gentamicin) (33%)

Urinary TractInfections (UTI)		
SURGERY WARD (Total no. of isolates= 121)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=62)	51	Fosfomycin (96%)/ Nitrofurantoin (76%)/ Amikacin (69%)/ Piperacillin-tazobactam (59%)/ Imipenem (55%)
<i>Klebsiella</i> species(n=27)	22	Amikacin (59%)/ Imipenem) (41%)/ Piperacillin-tazobactam (37%)/ Cotrimoxazole (26%)/ Cefepime (=Ceftazidime) (22%)
<i>Pseudomonas</i> species(n=17)	14	Piperacillin-tazobactam (65%)/ Imipenem (=Ceftazidime) (59%)/ Ciprofloxacin (53%)/ Gentamicin (=Amikacin) (47%)/ Aztreonam (41%)
<i>Enterococcus</i> species(n=6)	5	Fosfomycin (=Linezolid) (100%)/ Vancomycin (83%)/ Nitrofurantoin (50%)/
<i>Staphylococcus</i> species(n=5)	4	Linezolid (=Nitrofurantoin) (100%)/ Clindamycin (80%)/ Gentamicin (60%)/ Cotrimoxazole (=Doxycycline) (40%)
<i>Acinetobacter</i> species(n=4)	4	Tobramycin (=Amoxycalv=Fosfomycin=Ciprofloxacin=Cotrimoxazole=Ampicillin-Sulbactam=Ampicillin) (50%)/ Minocycline (=Gentamicin=Imipenem=Piperacillin-tazobactam=Ceftazidime) (25%)

Urinary TractInfections (UTI)		
ORTHOPAEDICS WARD (Total no. of isolates= 47)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=26)	55.5	Amikacin (85%)/ Piperacillin-tazobactam (75%)/ Imipenem (73%)/ Cotrimoxazole (31%)
<i>Klebsiella</i> species(n=15)	32	Amikacin (=Imipenem) (47%)/ Piperacillin-tazobactam (=Ciprofloxacin0 (27%)/ Cotrimoxazole (20%)
<i>Pseudomonas</i> species(n=3)	6.5	Piperacillin-tazobactam (65%)/ Imipenem (=Ceftazidime) (59%)/ Ciprofloxacin (53%)/ Gentamicin (=Amikacin) (47%)/ Aztreonam (41%)
<i>Acinetobacter</i> species(n=2)	4	Tetracycline (100%)
<i>Enterococcus</i> species(n=1)	2	Linezolid (=Fosfomycin=Vancomycin) (100%)

Urinary TractInfections (UTI)		
PAEDIATRICS WARD (Total no. of isolates= 79)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=59)	75	Fosfomycin (94%)/ Nitrofurantoin (80%)/ Amikacin (73%)/ Piperacillin-tazobactam (55%)/ Imipenem (54%)
<i>Klebsiella</i> species(n=16)	20	Piperacillin-tazobactam (73%)/ Nitrofurantoin (=Imipenem=Amikacin) (63%)/ Cotrimoxazole (25%)
<i>Enterococcus</i> species(n=3)	4	Nitrofurantoin (=Linezolid) (100%)/ Vancomycin (67%)/ Tetracycline (33%)
<i>Staphylococcus species</i> (n=1)	1	Nitrofurantoin (=Tetracycline=Linezolid=Doxycycline=Gentamicin=Ciprofloxacin) (100%)

Urinary TractInfections (UTI)		
OBSTETRICS AND GYNAECOLOGY WARD (Total no. of isolates= 165)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=106)	64.3	Amikacin (86%)/ Nitrofurantoin (93%)/ Imipenem (81%)Piperacillin-tazobactam (75)/ Cotrimoxazole (39%)
<i>Klebsiella</i> species(n=27)	16	Amikacin (82%)/ Imipenem) (74%)/ Ciprofloxacin (56%)/ Ceftazidime (33%)/ Cefepime (30%)
<i>Enterococcus</i> species(n=12)	7.3	Linezolid (100%)/ Vancomycin (92%)/ Ampicillin (67%)/ Penicillin (29%)/ Tetracycline (25%)
<i>Staphylococcus</i> species(n=8)	5	Clindamycin (=Linezolid) (100%)/ Ciprofloxacin (=Doxycycline=Cotrimoxazole) (63%)
<i>Acinetobacter</i> species(n=7)	4.3	Minocycline (29%)/ Tetracycline (27%)/ Fosfomycin (25%)
<i>Pseudomonas</i> species(n=5)	3	Tobramycin (=Amoxycalv=Fosfomycin=Ciprofloxacin=Cotrimoxazole= Ampicillin-Sulbactam= Ampicillin) (50%)/ Minocycline (=Gentamicin=Imipenem=Piperacillin-tazobactam=Ceftazidime) (25%)

Urinary TractInfections (UTI)		
NEONATOLOGY WARD (Total no. of isolates=9)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Klebsiella</i> species(n=6)	60	Piperacillin-tazobactam (50%)/ Nitrofurantoin (=Imipenem=Amikacin) (33%)/ Ciprofloxacin (=Ceftazidime=Cefepime) (17%)
<i>Escherichia coli</i> (n=3)	30	Fosfomycin (=Piperacillin-tazobactam) (100%)/ Amikacin (=Imipenem=Cefepime=Ciprofloxacin=Ceftazidime) (33%)
<i>Staphylococcus species</i> (n=1)	10	Nitrofurantoin (=Linezolid=Doxycycline=Gentamicin) (100%)

Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and/or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
<i>Send sample for culture</i>	<i>Send sample for culture</i>	<i>Send sample for culture</i>
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
1) Oral: Ciprofloxacin/Norfloxacin or Cefuroxime/Cefixime or Amoxicillin-Clavulanate 2) IV/IM: Ceftriaxone or Ofloxacin or Meropenem	1) Oral: Ciprofloxacin/Norfloxacin or Nitrofurantoin or Amoxicillin-Clavulanate 2) IV/IM: Meropenem or Piperacillin-Tazobactam + Amikacin	Meropenem or Piperacillin-Tazobactam + Amikacin
After Culture Report Continue Treatment	After Culture Report Continue Treatment	After Culture Report Continue Treatment
Susceptible bugs: Continue treatment	ESBL +ve <i>Enterobacteriales</i> : Continue treatment with monotherapy	Susceptible <i>Pseudomonas</i> / <i>Acinetobacter</i> : Continue with Imipenem (or Meropenem) ± Levofloxacin/Amikacin CA-MRSA/ <i>Enterococcus</i> : Add Vancomycin or Linezolid
Step down “De-escalate”	Step down “De-escalate”	Step down “De-escalate”
Use monotherapy	If susceptibility pattern improves, consider de-escalation (to oral drugs)	If susceptibility pattern improves, consider de-escalation (to oral drugs)
Consider Escalation	Consider Escalation	Consider Escalation
ESBL+ve <i>Enterobacteriales</i> /MRSA: Escalate and treat as patient type 2.	<i>Pseudomonas</i> +ve: Escalate and treat as patient Type 3	MDR- <i>Pseudomonas aeruginosa</i> or <i>Acinetobacter</i> : Continue 3 drug combination, Colistin + Imipenem + Sulbactam VRE/VRSA: Escalate to Linezolid/Daptomycin

WARDS

PUS		
MEDICINE WARD (Total no. of isolates= 456)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=107)	23.5	Linezolid (100%)/ Doxycycline (84%)/ Cotrimoxazole (83%)/ Clindamycin (80%)/ Gentamicin (65%)
<i>Escherichia coli</i> (n=105)	23	Amikacin (78%)/ (Imipenem) (69%)/ Piperacillin-tazobactam (59%)/ Cotrimoxazole (46%)/ Ceftazidime (24%)
<i>Klebsiella</i> species(n=87)	19	Amikacin (60%)/ Imipenem (=Piperacillin-tazobactam) (52%)/ Ciprofloxacin (40%)/ Cotrimoxazole (30%)
<i>Pseudomonas</i> species(n=68)	15	Imipenem (88%)/ Amikacin (=Ciprofloxacin=Piperacillin-tazobactam) (82%)/ Gentamicin (79%)/ Aztreonam (67%)
<i>Acinetobacter</i> species(n=61)	13.5	Minocycline (41%)/ Tobramycin (29%)/ Gentamicin (27%)/ Amikacin (23%)/ Tetracycline (21%)
<i>Enterococcus</i> species(n=28)	6	Linezolid (100%)/ Vancomycin (93%)/ Ampicillin (54%)/ Penicillin (28%)/ Ciprofloxacin (=Doxycycline) (14%)

PUS		
SURGERY WARD (Total no. of isolates= 1128)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=423)	38	Amikacin (76%)/ Imipenem (65%)/ Piperacillin-tazobactam (49%)/ Cotrimoxazole (33%)/ Cefepime (17%)
<i>Klebsiella</i> species(n=256)	23	Amikacin (61%)/ (Imipenem) (54%)/ Piperacillin-tazobactam (50%)/ Cotrimoxazole (38%)/ Ciprofloxacin (36%)
<i>Staphylococcus</i> species(n=191)	17	Linezolid (100%)/ Cotrimoxazole (=Clindamycin) (86%)/ Doxycycline (85%)/ Gentamicin (71%)
<i>Acinetobacter</i> species(n=126)	11	Minocycline (52%)/ Tetracycline (19%)/ Tobramycin (16%)/Amikacin (13%)/ Ampicillin-Sulbactam (12%)
<i>Pseudomonas</i> species(n=92)	8	Piperacillin-tazobactam (88%)/ Imipenem (76%)/ Amikacin (68%)/ Ciprofloxacin (65%)/ Ceftazidime (63%)
<i>Enterococcus</i> species(n=40)	3	Vancomycin (95%)/ Ampicillin (60%)/ Penicillin (25%)/ Ciprofloxacin (23%)/ Doxyxyxline (20%)

PUS		
ORTHOPAEDICS WARD (Total no. of isolates= 281)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=129)	46	Linezolid (100%)/ Clindamycin (92%)/ Doxycycline (90%)/ Cotrimoxazole (87%)/
<i>Klebsiella</i> species(n=43)	15	Imipenem (58%)/ Amikacin (54%)/ Piperacillin-tazobactam (47%)/ Ciprofloxacin (=Cotrimoxazole) (44%)
<i>Acinetobacter</i> species(n=32)	11.4	Minocycline (50%)/ Tetracycline (17%)/ Cotrimoxazole (19%)/ Imipenem (=Gentamicin) (16%)/ Tobramycin (15%)
<i>Pseudomonas</i> species(n=32)	11.4	Piperacillin-tazobactam (97%)/ Imipenem (94%)/ Gentamicin (=Ciprofloxacin)(81%)/Amikacin (75%)/ Aztreonam (72%)
<i>Escherichia coli</i> (n=29)	10.2	Amikacin (83%)/ Imipenem (59%)/ Cotrimoxazole (54%)/ Piperacillin-tazobactam (52%)/ Ciprofloxacin (=Cefotaxime) (31%)
<i>Enterococcus</i> species(n=16)	6	Vancomycin (=Linezolid) (100%)/ Penicillin (33%)/ Doxycycline (31%)

PUS		
PAEDIATRICS WARD (Total no. of isolates= 144)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Acinetobacter</i> species(n=52)	36	Tetracycline (82%)/ Minocycline (75%)/ Tobramycin (49%)/ Amikacin (44%)/ Cefepime (42%)
<i>Staphylococcus</i> species (n=41)	28.5	Linezolid (100%)/ Doxycycline (93%)/ Cotrimoxazole (88%)/ Clindamycin (83%)/ Gentamicin (81%)
<i>Klebsiella</i> species(n=28)	19.5	Cotrimoxazole (50%)/ Piperacillin-tazobactam (44%)/ Imipenem (=Amikacin) (43%)/ Ciprofloxacin (39%)
<i>Escherichia coli</i> (n=13)	9	Piperacillin-tazobactam (=Imipenem) (92%)/ Amikacin 985%)/ Gentamicin (82%)/ Cotrimoxazole (62%)
<i>Pseudomonas</i> species (n=5)	3.5	Piperacillin-tazobactam (100%)/ Amikacin (=Imipenem) (80%)/ Aztreonam (=Gentamicin) (60%)
<i>Enterococcus</i> species(n=5)	3.5	Vancomycin (=Linezolid) (100%)/ Penicillin (33%)/ Doxycycline (31%)

PUS		
OBSTETRICS AND GYNAECOLOGY WARD (Total no. of isolates= 168)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=79)	47	Amikacin (91%)/ Imipenem (84%)/ Piperacillin-tazobactam (75%)/ Cotrimoxazole (49%)/ Ciprofloxacin (35%)
<i>Klebsiella</i> species(n=49)	29.1	Amikacin 965%)/ Imipenem (61%)/ Piperacillin-tazobactam (51%)/ Ciprofloxacin (49%)/ Cotrimoxazole (40%)
<i>Acinetobacter</i> species(n=24)	14.3	Minocycline (71%)/ Tetracycline (57%)/ Tobramycin (33%)/ Gentamicin (29%)/ Cotrimoxazole (=Imipenem) (25%)
<i>Staphylococcus</i> species(n=10)	6	Linezolid (=Doxycycline) (100%)/ Clindamycin (90%)/ Gentamicin (80%)/ Cotrimoxazole (78%)
<i>Pseudomonas</i> species(n=4)	2.4	Amikacin (=Ceftazidime=Gentamicin=Imipenem) (100%)/ Ciprofloxacin (=Aztreonam) (75%)
<i>Enterococcus</i> species(n=2)	1.2	Vancomycin (=Linezolid=Ampicillin) (100%)/ Penicillin (50%)

PUS		
NEONATOLOGY WARD (Total no. of isolates= 15)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=13)	87	Linezolid (100%)/ Doxycycline (92%)/ Clindamycin (85%)/ Cotrimoxazole (77%)/ Gentamicin (54%)
<i>Enterococcus</i> species(n=1)	6.5	Vancomycin (=Linezolid=Ampicillin) (100%)
<i>Klebsiella</i> species(n=1)	6.5	Colistin (100%)

Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
Send sample for culture	Send sample for culture	Send sample for culture
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
MSSA SSTI Nafcillin/Oxacillin/Dicloxacillin/Amoxicillin-Clavulanate Cephalexin/Cefadroxil/Cefuroxime Doxycycline/Minocycline TMP-SMZ MRSA SSTI: Vancomycin Linezolid* Clindamycin Daptomycin Doxycycline/Minocycline TMP-SMZ	Ertapenem/Amikacin/Piperacillin-tazobactam/Cefoperazone-Sulbactam If MRSA: Vancomycin/Teicoplanin/Linezolid First consider oral therapy, if patient is unable to take, then switch to parenteral therapy.	Vancomycin (or Teicoplanin) + Imipenem (or Meropenem)
After Culture Report: Continue Treatment	After Culture Report: Continue Treatment	After Culture Report: Continue Treatment
MSSA/ <i>E.coli</i> : Continue treatment	ESBL +veEnterobacterales, continue treatment based on antibiotic sensitivity	Non MDR <i>Pseudomonas</i> : Imipenem (or Meropenem); MRSA: Vancomycin monotherapy
Step down “De-Escalate” Continue monotherapy	Step down “De-Escalate” ESBL -veEnterobacterales /MSSA: De-escalate and treat as patient Type 1 Enterococcus: use Tigecycline/ Vancomycin	Step down “De-Escalate” ESBL +veEnterobacterales: De-escalate to Tigecycline/Vancomycin/Teicoplanin MRSA: Monotherapy with Vancomycin/Teicoplanin MSSA: Monotherapy
Consider Escalation	Consider Escalation	Consider Escalation
ESBL+ve: Escalate and treat as Patient Type 2 MRSA: Add Vancomycin or Teicoplanin	<i>Pseudomonas</i> : Escalate and treat as Patient Type 3	MDR <i>Pseudomonas</i> / <i>Acinetobacter</i> : Escalate to Colistin + Imipenem + Sulbactam combination. Add Vancomycin in case of MRSA

**Enterococci* susceptible to penicillin are predictably susceptible to ampicillin, amoxicillin, ampicillin-sulbactam, amoxicillin-clavulanate and piperacillin-tazobactam for non-Beta Lactamase producing *Enterococci*.

OPD

Blood Stream Infections		
MEDICINE OPD (Total no. of isolates= 34)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species*(n=28)	82	Linezolid (100%)/ Doxycycline (86%)/Gentamicin (82%)/ Ciprofloxacin (71%)/ Cotrimoxazole (68%)/ Clindamycin (64%)
<i>Acinetobacter</i> species(n=3)	9	Tetracycline (100%)/ Minocycline (=Gentamicin=Piperacillin-tazobactam=Amikacin=Ciprofloxacin=Cotrimoxazole) (67%)/ Tobramycin (50%)
<i>Escherichia coli</i> (n=2)	6	Amikacin (=Piperacillin-tazobactam=Imipenem=Cotrimoxazole)(100%)/ Ciprofloxacin (=Cefepime=Ceftazidime=Cefotaxime=Ampicillin) (50%)
<i>Klebsiella</i> species(n=1)	3	Amikacin (=Piperacillin-tazobactam) (100%)

Blood Stream Infections		
SURGERY OPD (Total no. of isolates= 6)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species*(n=2)	33.33	Linezolid (Doxycycline=Gentamicin) (100%)/ Clindamycin (=Cotrimoxazole) (50%)
<i>Acinetobacter</i> species(n=2)	33.33	Minocycline (50%)
<i>Escherichia coli</i> (n=1)	16.66	Amikacin (=Piperacillin-tazobactam=Imipenem=Cotrimoxazole=Ciprofloxacin)(100%)
<i>Klebsiella</i> species(n=1)	16.66	Amikacin (=Piperacillin-tazobactam=Imipenem=Cefepime=Ciprofloxacin=Ceftazidime=Ampicillin) (100%)

Blood Stream Infections		
ORTHOPAEDICS OPD (Total no. of isolates= 1)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species*(n=1)	100	Linezolid (=Erythromycin=Ciprofloxacin=Clindamycin=Cotrimoxazole=Doxycycline=Gentamicin) (100%)/

Blood Stream Infections		
PAEDIATRICS OPD (Total no. of isolates= 17)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species*(n=11)	61	Linezolid(100%)/ Gentamicin (=Cotrimoxazole) (91%)/ Clindamycin (82%)/ Doxycycline (64%)
<i>Acinetobacter</i> species(n=3)	16.5	Minocycline (=Gentamicin) (67%)/ Cefepime (=Ampicillin) (50%)/ Piperacillin-tazobactam (=Imipenem=Amikacin=Ciprofloxacin) (33%)
<i>Escherichia coli</i> (n=3)	16.5	Amikacin (=Piperacillin-tazobactam=Imipenem=Ceftazidime)(100%)/ Ciprofloxacin (=Cefepime) (67%)
<i>Enterococcus</i> species(n=1)	6	Vancomycin (=Linezolid=Doxycycline=Tetracycline=Ampicillin=Ciprofloxacin) (100%)

Blood Stream Infections		
OBSTETRICS AND GYNAECOLOGY OPD (Total no. of isolates= 2)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species* (n=2)	100	Linezolid (=Ciprofloxacin=Clindamycin=Cotrimoxazole=Doxycycline=Gentamicin) (100%)/ Clindamycin (50%)

Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
<i>Send sample for culture</i>	<i>Send sample for culture</i>	Send sample for culture
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
Ampicillin/ Ampicillin-sulbactam/ Amoxi- Clavulanate Ceftriaxone/ Cefixime Ciprofloxacin*	Ceftriaxone	Ceftriaxone ± Amikacin or Ciprofloxacin
After Culture Report Continue Treatment	After Culture Report Continue Treatment	After Culture Report Continue Treatment
Susceptible bugs: Continue treatment	Continue monotherapy	Susceptible bugs: Continue treatment
Step down “De-escalate”	Step down “De-escalate”	Step down “De-escalate”
Use monotherapy	Non ESBL Enterobacteriaceae: Treat as Patient type 1	ESBL +ve Enterobacteriales: De-Escalate to Ertapenem, Non ESBL: De-Escalate to Cefixime or Ceftriaxone
Consider Escalation	Consider Escalation	Consider Escalation
ESBL+ <i>Salmonella</i> or Enterobacteriales. Escalate to Ertapenem or Tigecycline	ESBL +ve: Escalate to Ertapenem or Tigecycline	<i>Acinetobacter</i> / <i>Pseudomonas</i> : Continue Imipenem or Meropenem ± Amikacin

**Staphylococcus* species may not be the true pathogen.
Taking aseptic precautions while blood collections is essential.

OPD

Urinary Tract Infections (UTI)		
MEDICINE OPD (Total no. of isolates= 145)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=103)	71	Fosfomycin (96%) / Amikacin (86%) / Nitrofurantoin (83%) / Imipenem (82%) / Piperacillin-tazobactam (79%)
<i>Klebsiella</i> species(n=24)	17	Imipenem (83%) / Piperacillin-tazobactam (82%) / Amikacin (75%) / Cotrimoxazole (67%) / Ceftazidime (=Cefotaxime) (63%) / Ampicillin (=Cefepime) (58%) /
<i>Enterococcus</i> species(n=8)	5	Fosfomycin (=Linezolid) (100%) / Vancomycin (88%) / Nitrofurantoin (86%) / Ampicillin (75%)
<i>Staphylococcus</i> species(n=6)	4	Nitrofurantoin (=Tetracycline=Linezolid=Doxycycline) (100%) / Clindamycin(=Cotrimoxazole) (83%) / Gentamicin (67%)
<i>Pseudomonas</i> species(n=4)	3	Gentamicin (=Aztreonam=Amikacin=Imipenem=Piperacillin-tazobactam) (75%)

Urinary Tract Infections (UTI)		
SURGERY OPD (Total no. of isolates= 46)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=28)	61	Fosfomycin (90%) / Nitrofurantoin (86%) / Piperacillin-tazobactam (84%) / Imipenem (78%) / Amikacin (75%)
<i>Klebsiella</i> species(n=11)	24	Piperacillin-tazobactam (25%) / Imipenem (=Amikacin=Cotrimoxazole) (18%)
<i>Enterococcus</i> species(n=2)	4.3	Fosfomycin (=Vancomycin=Nitrofurantoin=Ampicillin=Linezolid=Clindamycin) (100%)
<i>Staphylococcus</i> species(n=2)	4.3	Cotrimoxazole (=Clindamycin=Linezolid=Nitrofurantoin) (100%) / Ciprofloxacin (=Gentamicin=Doxycycline=Tetracycline) (50%)
<i>Pseudomonas</i> species(n=2)	4.3	Aztreonam (=Piperacillin-tazobactam=Imipenem=Amikacin) (100%) / Gentamicin (50%)
<i>Acinetobacter</i> species(n=1)	2	Minocycline (=Gentamicin=Tobramycin=Amoxicillin-clavulanic acid=Nitrofurantoin=Fosfomycin=Imipenem=Piperacillin-tazobactam=Amikacin) (100%)

Urinary Tract Infections (UTI)		
ORTHOPAEDICS OPD (Total no. of isolates= 13)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=10)	77	Imipenem (90%) / Fosfomycin (83%) / Nitrofurantoin (80%) / Amikacin (80%) / Piperacillin-tazobactam (67%)
<i>Klebsiella</i> species(n=2)	15	Imipenem (100%) / Nitrofurantoin (Amikacin=Piperacillin-tazobactam=Amoxicillin-clavulanic acid=Cotrimoxazole=Ciprofloxacin)(50%)
<i>Enterococcus</i> species(n=1)	8	Fosfomycin (=Vancomycin=Linezolid) (100%)

Urinary Tract Infections (UTI)		
PAEDIATRICS OPD (Total no. of isolates= 22)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=15)	68	Amikacin (93%)/ Fosfomycin (91%)/ Nitrofurantoin (87%)/Piperacillin-tazobactam (8%)/ Imipenem (78%)/
<i>Klebsiella</i> species(n=5)	23	Amikacin (=Imipenem=Piperacillin-tazobactam) (100%)/ Nitrofurantoin (=Cotrimoxazole) (80%)/ Ciprofloxacin (=Cefepime=Ceftazidime) (60%)
<i>Enterococcus</i> species(n=1)	4.5	Vancomycin (=Ampicillin=Linezolid) (100%)
<i>Staphylococcus</i> species(n=1)	4.5	Linezolid (=Doxycycline=Gentamicin=Clindamycin) (100%)/ Erythromycin (32%)

Urinary Tract Infections (UTI)		
OBSTETRICS AND GYNAECOLOGY OPD (Total no. of isolates= 142)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=103)	72	Fosfomycin (96%)/ Amikacin (=Imipenem) (94%)/ Piperacillin-tazobactam (91%)/ Ceftazidime (62%)/ Cefepime (49%)/ Cotrimoxazole (43%)
<i>Klebsiella</i> species(n=23)	16	Amikacin (91%)/ Imipenem (87%)/Piperacillin-tazobactam (86%)/ Cotrimoxazole (83%)/ Ciprofloxacin (74%) Nitrofurantoin (70%)
<i>Staphylococcus</i> species(n=5)	3.5	Linezolid (100%)/ Gentamicin (=Clindamycin) (80%)/ Doxycycline (60%)/ Cotrimoxazole (40%)
<i>Enterococcus</i> species(n=4)	3.5	Vancomycin (=Linezolid=Nitrofurantoin=Fosfomycin) (100%)/ Ampicillin(50%)
<i>Pseudomonas</i> species(n=4)	3	Aztreonam (=Piperacillin-tazobactam=Imipenem=Gentamicin=Ciprofloxacin=Ceftazidime=Gentamicin) (100%)
<i>Acinetobacter</i> species(n=3)	2	Ampicillin-Sulbactam(=Tetracycline=Tobramycin) (100%)/ Amikacin (=Cefepime=Ciprofloxacin=Ceftazidime=Cotrimoxazole=Gentamicin) (67%)/

Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
<i>Send sample for culture</i>	<i>Send sample for culture</i>	Send sample for culture
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
Ampicillin/sulbactam Ticarcillin/clavulanic acid/CefSul Ciprofloxacin*/Norfloxacin/Ofloxacin Nitrofurantoin Cefuroxime	Amikacin / Ertapenem / No Tigecycline**)	Amikacin/Ertapenem
After Culture Report Continue Treatment	After Culture Report Continue Treatment	After Culture Report Continue Treatment
Non ESBL Enterobacteriaceae, use susceptible antibiotic as monotherapy	ESBL +ve <i>Enterobacterales</i> : Continue treatment with monotherapy	Susceptible bugs: Continue with monotherapy . <i>Enterococcus</i> : Shift to Vancomycin
Step down “De-escalate”	Step down “De-escalate”	Step down “De-escalate”
Use monotherapy	If susceptibility pattern improves, consider de-escalation and treat as patient Type 1	ESBL -ve <i>Enterobacterales</i> , De-Escalate to patient type 1
Consider Escalation	Consider Escalation	Consider Escalation
ESBL+ve <i>Enterobacterales</i> /MRSA: Escalate and treat as patient type 2.	<i>Pseudomonas</i> +ve: Escalate and treat as patient Type 3	MDR - PA: Escalate to a Combination therapy, Colistin+Imipenem+Sulbactam

* Avoid Ciprofloxacin and Levofloxacin since they have potent anti-pseudomonal activity

** Tigecycline does not get excreted in urine, therefore it is not a treatment of choice for UTI due to ESBL producing *E.coli*.

OPD

MEDICINE OPD (Total no. of isolates= 100)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=33)	33	Linezolid (100%)/ Clindamycin (=Cotrimoxazole) (91%)/ Doxycycline (82%)/ Gentamicin (79%)
<i>Escherichia coli</i> (n=20)	20	Amikacin (85%)/ Imipenem (65%)/Piperacillin-tazobactam (60%)/ Cefepime (35%)/ Ceftazidime (25%)
<i>Pseudomonas</i> species(n=17)	17	Piperacillin-tazobactam (94%)/ Gentamicin (=Amikacin=Imipenem) (88%)/ Ciprofloxacin (82%)/ Aztreonam (=Ceftazidime) (76%)
<i>Klebsiella</i> species(n=15)	15	Amikacin (=Ciprofloxacin=Piperacillin-tazobactam=Imipenem) (60%)/ Cotrimoxazole (40%)
<i>Acinetobacter</i> species(n=14)	14	Minocycline (50%)/ Imipenem (=Cotrimoxazole) (38%)/ Piperacillin-tazobactam (=Ceftazidime) (36%)/ Ampicillin-Sulbactam (29%)
<i>Enterococcus</i> species(n=1)	1	Vancomycin (=Linezolid=Ampicillin) (100%)/

PUS		
SURGERY OPD (Total no. of isolates= 299)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=117)	39	Linezolid (100%)/ Clindamycin (86%)/ Cotrimoxazole (81%)/ Doxycycline (80%)/ Gentamicin (75%)
<i>Escherichia coli</i> (n=61)	20.5	Amikacin (89%)/ Imipenem (82%)/Piperacillin-tazobactam (70%)/ Cotrimoxazole (36%)/ Ceftazidime (34%)
<i>Klebsiella</i> species(n=51)	17	Amikacin (=Imipenem) (75%)/ Piperacillin-tazobactam (69%)/ Cotrimoxazole (55%)/ Ciprofloxacin (53%)/ Cefepime (51%)
<i>Pseudomonas</i> species(n=37)	12.5	Amikacin (=Ciprofloxacin=Piperacillin-tazobactam=Imipenem) (60%)/ Cotrimoxazole (40%)
<i>Acinetobacter</i> species(n=24)	8	Minocycline (71%)/ Tetracycline (38%)/ Tobramycin (30%)/ Cefepime (28%)/ Gentamicin (=Amikacin) (21%)
<i>Enterococcus</i> species(n=9)	3	Linezolid(100%)/ Vancomycin (89%)/ Ampicillin (67%)/ Penicillin (43%)/ Ciprofloxacin (=Doxycycline) (22%)

PUS		
ORTHOPAEDICS OPD (Total no. of isolates= 81)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=46)	57	Linezolid (100%)/ Clindamycin (=Cotrimoxazole) (96%)/ Doxycycline (94%)/ Gentamicin (80%)
<i>Acinetobacter</i> species(n=9)	11	Amikacin (56%)/ Tobramycin (38%)/ Imipenem (=Gentamicin=Minocycline=Cefepime) (33%)
<i>Klebsiella</i> species(n=9)	11	Amikacin (78%)/ Imipenem (67%)/ Ciprofloxacin (56%)/ Piperacillin-tazobactam(=Cotrimoxazole=Cefepime) (44%)
<i>Pseudomonas</i> species(n=7)	8.5	Aztreonam (100%)/ Amikacin (=Gentamicin=Piperacillin-tazobactam=Imipenem) (86%)/
<i>Escherichia coli</i> (n=7)	8.5	Amikacin (Imipenem=Piperacillin-tazobactam) (71%)
<i>Enterococcus</i> species(n=3)	4	Linezolid (=Vancomycin=Tetracycline=Doxycycline=Ampicillin) (100%)

PUS		
PAEDIATRICS OPD (Total no. of isolates= 8)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=5)	62.5	Linezolid (=Clindamycin) (100%)/ Gentamicin (=Doxycycline=Cotrimoxazole) (80%)
<i>Acinetobacter</i> species(n=1)	12.5	Tetracycline (=Tobramycin) (100%)
<i>Klebsiella</i> species(n=1)	12.5	Amikacin (=Imipenem=Ciprofloxacin=Piperacillin-tazobactam=Cotrimoxazole=Cefepime) (100%)
<i>Pseudomonas</i> species(n=1)	12.5	Aztreonam (=Gentamicin=Piperacillin-tazobactam=Imipenem=Amikacin) (100%)

PUS		
OBSTETRICS AND GYNAECOLOGY OPD (Total no. of isolates= 27)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species(n=10)	37	Linezolid (=Doxycycline)(100%)/ Clindamycin (90%)/ Gentamicin (80%)/ Cotrimoxazole (78%)
<i>Escherichia coli</i> (n=6)	22	Amikacin (=Imipenem=Piperacillin-tazobactam) (100%)/ Cotrimoxazole (=Ciprofloxacin=Ceftazidime) (33%)
<i>Pseudomonas</i> species(n=4)	15	Amikacin (=Aztreonam=Ceftazidime=Gentamicin=Imipenem=Piperacillin-tazobactam) (100%)
<i>Klebsiella</i> species(n=3)	11	Amikacin(=Ceftazidime=Piperacillin-tazobactam=Imipenem) (67%)
<i>Acinetobacter</i> species(n=2)	7.5	Minocycline (100%)/ Gentamicin (=Cotrimoxazole) (50%)
<i>Enterococcus</i> species(n=2)	7.5	Linezolid (=Vancomycin=Ampicillin) (100%)/ Penicillin (50%)

Patient Type 1 (CAI)	Patient Type 2 (HAI)	Patient Type 3 (NI)
No contact with health care system	Contact with health care system (e.g. recent hospital admission, nursing home, dialysis) without invasive procedure	Long hospitalization and or invasive procedures
No prior antibiotic treatment	Recent antibiotic therapy	Recent & multiple antibiotic therapies
Patient young with no or few co-morbid conditions	Patient old (>65 years) with few co-morbidities	Patient old (>65 years) + multiple co-morbidities. (Cystic fibrosis, structural lung disease, advanced AIDS, neutropenia, other severe immunodeficiency)
<i>Send sample for culture</i>	<i>Send sample for culture</i>	<i>Send sample for culture</i>
PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY	PRESUMPTIVE THERAPY
MSSA SSTI Nafcillin/Oxacillin/Dicloxacillin/Amoxicillin-Clavulanate Cephalexin/Cefadroxil/Cefuroxime Doxycycline/Minocycline TMP-SMZ MRSA SSTI: Vancomycin Linezolid* Clindamycin Daptomycin Doxycycline/Minocycline TMP-SMZ	Ertapenem/Amikacin/Piperacillin-tazobactam/Cefoperazone-Sulbactam If MRSA: Vancomycin/Teicoplanin/Linezolid First consider oral therapy, if patient is unable to take, then switch to parenteral therapy.	Vancomycin (or Teicoplanin) + Imipenem (or Meropenem)
After Culture Report: Continue Treatment	After Culture Report: Continue Treatment	After Culture Report: Continue Treatment
MSSA/ <i>E.coli</i> : Continue treatment	ESBL +ve Enterobacterales, continue treatment based on antibiotic sensitivity	Non MDR <i>Pseudomonas</i> : Imipenem (or Meropenem); MRSA: Vancomycin monotherapy
Step down “De-Escalate”	Step down “De-Escalate”	Step down “De-Escalate”
Continue monotherapy	ESBL -ve Enterobacterales/MSSA: De-escalate and treat as patient Type 1 <i>Enterococcus</i> : use Tigecycline/Vancomycin	ESBL +ve Enterobacterales/Enterococcus: De-escalate to Tigecycline/Vancomycin/Teicoplanin MRSA: Monotherapy with Vancomycin/Teicoplanin MSSA - Monotherapy
Consider Escalation	Consider Escalation	Consider Escalation
ESBL+ve: Escalate and treat as Patient Type 2 MRSA, Enterococcus: Add Vancomycin or Teicoplanin	<i>Pseudomonas</i> +ve: Escalate and treat as Patient Type 3	MDR <i>Pseudomonas</i> / <i>Acinetobacter</i> : Escalate to Colistin + Imipenem + Sulbactam combination. Add Vancomycin in case of MRSA

**Enterococci* susceptible to penicillin are predictably susceptible to ampicillin, amoxicillin, ampicillin-sulbactam, amoxicillin-clavulanate, and piperacillin-tazobactam for non-Beta-lactamase-producing *Enterococci*.

SSI

SURGICAL SITE INFECTIONS (SSI)		
ORTHOPAEDICS (Total no. of isolates= 54)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Staphylococcus</i> species (n=18)	33	Doxycycline (=Linezolid) (100%), Cotrimoxazole (78%), Erythromycin (39%)
<i>Acinetobacter</i> species (n=9)	17	Tobramycin (=Gentamicin=Minocycline) (55%) , Tetracycline (44%), Ciprofloxacin (=Ceftazidime=Amikacin) (33%)
<i>Escherichia coli</i> (n=9)	17	Gentamicin (=Amikacin=Piperacillin-Tazobactam) (78%), Meropenem (=Imipenem=Cotrimoxazole) (67%)
<i>Klebsiella</i> species (n=6)	11	Imipenem (=Meropenem=Gentamicin=Cotrimoxazole) (50%)
<i>Enterococcus</i> species (n=4)	7	Ampicillin (=Gentamicin=Vancomycin=Penicillin=Linezolid) (75%)
<i>Pseudomonas</i> species (n=4)	7	Imipenem (=Meropenem=Tobramycin) (100%), Aztreonam (=Piperacillin-Tazobactam=Cefepime=Ceftazidime) (75%)
<i>Citrobacter</i> species(n=3)	6	Amikacin (=Doxycycline) (67%), Imipenem (=Meropenem) (33%)
<i>Providencia</i> species (n=1)	2	Imipenem(=Meropenem=Piperacillin-Tazobactam) (100%)

SURGICAL SITE INFECTIONS (SSI)		
SURGERY (Total no. of isolates= 127)		
Most Common Pathogen	%	Antibiotics Susceptibility
<i>Escherichia coli</i> (n=66)	52	Amikacin (100%), Gentamicin (93%), Meropenem (80%), Piperacillin-Tazobactam (30%), Ceftazidime (16%)
<i>Klebsiella</i> species (n=18)	14.2	Gentamicin (=Meropenem) (50%), Amikacin (44%), Piperacillin-Tazobactam (39%), Imipenem (=Ciprofloxacin=Cotrimoxazole=Ceftazidime) (22%)
<i>Acinetobacter</i> species (n=16)	12.5	Minocycline (50%), Tobramycin (19%), Meropenem (=Cotrimoxazole=Tetracycline=Gentamicin) (12%)
<i>Staphylococcus</i> species (n=13)	10	Doxycycline (=Linezolid) (100%), Cotrimoxazole (92%), Vancomycin (92%), , Gentamicin (85%)
<i>Enterococcus</i> species (n=9)	7	Vancomycin (89%), Linezolid (78%),Doxycycline (44%), Penicillin (=Ampicillin) (22%)
<i>Pseudomonas</i> species (n=4)	3	Ceftazidime (=Ciprofloxacin=Cefepime=Imipenem=Piperacillin-Tazobactam=Meropenem=Aztreonam) (100%)
<i>Pseudomonas mirabilis</i> (n=1)	0.8	Imipenem (=Piperacillin-Tazobactam=Gentamicin) (100%)