Annexure-VII

Antibiotic Policy for Central Institute of Psychiatry

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FOREWORD

Our institute has formulated an "Antibiotic Policy" based on the prevalent antibiogram and as per the standards set by "National Treatment Guidelines for Antimicrobial Use in Infectious Disease" by NCDC, DGHS, GoI. The rise of antimicrobial resistance has posed a great threat to the morbidity, mortality and rise in healthcare costs in patients. Irrational use of antibiotics along with misuse and self-medication are few factors leading to such widespread infections which are resistant to newer and more potent antibiotics.

Rationale use of antibiotics is the need of the hour for curbing the resistance and therefore I feel that this document will assist the faculty, officers and resident doctors for making an appropriate choice of antibiotics for the empirical therapy of various infective conditions in adults and paediatric patients.

I congratulate the assigned Infection Control Committee of the institute for compiling this document and wish that the policy is periodically reviewed and updated for changes in the antibiotic susceptibility trends at our hospital.

10/12/2024

(Dr. V. K. Chaudhary)
Director
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INTRODUCTION

AIMS OF ANTIMICROBIAL THERAPY

1. To provide a simple, best empirical/specific treatment of common infections
2. To promote the safe, effective, economic and rational use of antibiotics
3. To minimise the emergence of bacterial resistance in the community

PRINCIPLES OF TREATMENT

1. These guidelines are based on the best available evidence.
2. A dose and duration of treatment is suggested but can be modified by consultants based on clinical scenarios
3. Prescribe an antibiotic only when there is likely to be a clear clinical benefit.
4. Do not prescribe an antibiotic for viral sore throat, simple coughs and colds and viral diarrhoea.
5. Use simple generic antibiotics first whenever possible. Avoid broad spectrum antibiotics (e.g. Amoxycillin+Clavulanate, quinolones and cephalosporins) when standard and less expensive antibiotics remain effective, as they increased risk of Clostridium difficile, MRSA and resistant UTIs.
6. Avoid widespread use of topical antibiotics (especially those agents also available as systemic preparations).
7. Clarithromycin is an acceptable alternative in those who are unable to tolerate erythromycin because of side effects.
8. Test dose to be given for beta-lactam antibiotics.

STEPS TO FOLLOW THE PROTOCOLS

1. Identify the type of infection — bloodstream, respiratory, intra-abdominal or urinary tract,
2. Define the location — OPD, ICU or floor patient
3. Wait for atleast 48hrs of antimicrobial therapy before labelling patient as non-responding to the therapy and to switch to the higher next line of therapy. Also consider if patient condition deteriorates.
4. Send respective cultures and or primary set of investigations before starting antibiotic therapy
5. Once culture / sensitivity report available initiate specific antimicrobial therapy. Antimicrobial may require to be changed/de-escalated.

- It is emphasized that antimicrobials should be prescribed only when they are necessary in treatment following a clear diagnosis. Not all patients need antibiotics; non–drug treatment may be suitable and this has been emphasized in these guidelines.
- In all cases, the benefit of administering the medicine should be considered in relation to the risk involved. This is particularly important during pregnancy where the risk to both mother and foetus must be considered.
- The content of these treatment guidelines will undergo a process of continuous review. Comments or suggestions for improvement are welcome.
  These suggestions may be sent to: sk.suryavanshi@gmail.com

DISCLAIMER:

This publication provides only suggestive guidelines and the opinions expressed herein reflect those of the contributors. The protocols described herein are general and may not apply to a specific patient. They should NOT supplant clinical judgment, factors like hemodynamics of specific patients, availability of antimicrobials and local antibiogram of healthcare setting.

GASTROINTESTINAL & INTRA-ABDOMINAL INFECTIONS

Condition	Likely Causative Organisms	Empiric (presumptive) antibiotics/ First Line	Alternative antibiotics/ Second Line	Comments
Acute Gastroenteritis	Viral, Entero-toxigenic & Entero-pathogenic *E.coli*	None	None	Rehydration(oral/ IV)essential
Food poisoning	*S.aureus, B. cereus, C. botulinum*			
Cholera	*V. cholerae*	Doxycycline 300mgO ralstat Azithromycin Oral in children (20mg/kg) and pregnant women (1g)	Azithromycin 1gm Oral stat or Ciprofloxacin 500mg BD for 3days	Rehydration (oral/IV) Is essential Antibiotics are adjunctive therapy.
Bacterial dysentery	*Shigella sp.,* Campylobacter, Non-typhoidal salmonellosis Shiga toxin Producing *E.coli*	Ceftriaxone 2gm IV OD for 5days or oral cefixime 8 mg/kg/day x 5days Antibiotic Treatment Not recommended.	Azithromycin 1g OD x3days	For Campylobacter the drug of choice is azithromycin. Antibiotic Use associated with development of hemolytic uremic syndrome.
Amoebic dysentery	*E. histolytica*	Metronidazole 400mg Oral TDS for7- 10days	Tinidazole 2gm Oral OD for 3days	Add diloxanide furoate 500mg TDS for 10d
Giardiasis	*Giardia lamblia*	Metronidazole 200-400mg oral TIDx 7-10d	Tinidazole 2gm oral x1dose	
Enteric fever	*S.* Typhi, *S.* ParatyphiA	<u>Outpatients:</u> Cefixime 20mg/kg/day for 14 days or Azithromycin 500 mg BD for 7days. <u>Inpatients:</u> Ceftriaxone 2g IV BD for 2 weeks +/- Azithromycin 500mg BD for 7days	Cotrimoxazole 960 mg BD for 2 weeks	Majority of strains are nalidixic acid resistant. Ceftriaxone to be changed to oral cefixime when patient is afebrile to finish total duration of 14 days.
Biliary tract infections (cholangitis, cholecystitis)	Enterobacteriacea e*(E.coli, Klebsiella sp.)*	Ceftriaxone 2gm IV OD or Piperacillin-Tazobactam 4.5gm IV 8 hourly Or Cefoperazoe-Sulbactam 3gm IV 12 hourly For 7-10days	Imipenem 500 mg IV 6 hourly or Meropenem 1 gm IV 8hourly For7-10days	Surgical or endoscopic intervention to be considered if there is biliary obstruction. High prevalence of ESBL producing *E.coli, Klebsiella sp.*strains. De-escalate therapy once antibiotic susceptibility is known.

Hospital acquired diarrhea	*C. difficile*	Metronidazole 400 mg oral TDS for 10 days	Severe disease: start Vancomycin 250 mg oral 6 h empirically.	
Spontaneous bacterial	S pneumoniae	Cefotaxime1-2gm IV TDS Or Piperacillin-Tazobactam 4.5gm IV 8 hourly Or Cefoperazone-Sulbactam 3 gm IV 12h	Imipenem 500mg IV	Descalate to
Peritonitis	E coli Klebsiella Enterococcus		6 hourly or Meropenem 1gm IV 8 hourly	Ertapenem 1gm IV OD for 5-7 days once the patient improves
Secondary peritonitis, Intra-abdominal abscess/ GI perforation	Enterobacteriaceae (*E.coli, Klebsiella sp.*), Bacteroides (colonic perforation), Anaerobes	Piperacillin-Tazobactam 4.5gm IV 8 hourly Or Cefoperazone-Sulbactam 3gm IV 12 hourly in severe infections In very sick patients, if required, addition of cover for yeast (fluconazole iv800mg loading dose day1, followed by 400mg 2nd day onwards) & And for Enterococcus (vancomycin / teicoplanin) may be contemplated	Imipenem 1g IV 8hourly Or Meropenem 1gm IV 8hourly or Ertapenem 1gm IV OD	*Source control is important to reduce bacterial load.* If excellent source control– for 5-7days; otherwise 2-3 weeks suggested.
Pancreatitis Mild-moderate		No antibiotics		
Post necrotizing pancreatitis: infected pseudocyst; pancreatic abscess	*Entrobacteriaceae, Enterococci, S.aureus, S. epidermidis, anaerobes, Candida sp.*	Piperacillin-Tazobactam 4.5gm IV8hourly empiricallyor Cefoperazone-Sulbactam 3gmIV 8hourly in severe infections	Imipenem-Cilastatin 500mg IV 6 hourly or Meropenem 1gm IV 8 hourly	Duration of treatment is based on source control and clinical improvement
		In very sick patients, if required, addition of cover for yeast (fluconazoleiv800mg loading dose day1, followed by 400mg 2nd day onwards) & and for Enterococcus (vancomycin /teicoplanin) may		

		be contemplated For 7-10days		
Diverticulitis Mild- OPD treatment	*Gram-Negative Bacteria Anaerobes*	Co-trimoxazole DS 800/160mg BD for 7-10 days	Ciprofloxacin+ Metronidazole for 7days	
Diverticulitis moderate	*Gram-Negative Bacteria Anaerobes*	Ceftriaxone 2 gm IV OD + metronidazole 500 mg IV TDS or Piperacillin-Tazobactam 4.5 gm IV 8hourly empirically or Cefoperazone-Sulbactam 3 gm IV 8 hourly		BL-BLI agents have very good anaerobic cover, so no need to add metronidazole.
Diverticulitis Severe	*Gram-Negative Bacteria Anaerobes*	Meropenem 1gm IV 8hrly or Imipenem Cilastatin 500 mg IV 6 hourly		Duration based on improvement
LiverAbscess	*Polymicrobial*	Amoxycillin-clavulanate/ 3rdgeneration cephalosporin + Metronidazole 500mgI.V. TID/ 800 mg oral TID for 2	Piperacillin-Tazobactam 4.5gm IV 8 hourly	Ultrasound guided drainage indicated in large abscesses, signs of imminent rupture and no response to medical treatment.

CENTRAL NERVOUS SYSTEM INFECTIONS

Condition	Likely Causative Organisms	Empiric antibiotics (presumptive antibiotics)	Alternative antibiotics	Comments
Acute bacterial	*Streptococcus*	Ceftriaxone 2g IV 12hourly 10-14days treatment	Meropenem 1gm 8	Antibiotics should be
Meningitis	*pneumoniae, Haemophilus influenzae, Neisseria meningitidis*		hourly 7-14 days + Vancomycin 1gm BD x 14 days	started as soon as the possibility of bacterial meningitis becomes evident, ideally within 30 minutes. Do not wait for CT scan or LP results. No need to add vancomycin as primary agent, as ceftriaxone resistant *Pneumococcus* is not common in India. *Listeria* is also rare in India and so ampicillin is also not indicated Adjust therapy once pathogen and susceptibilities are known.
Acutebacterial Meningitis in Elderly (>55 yrs), alcoholics, Immune compromised	*Listeria monocytogenes*	Ampicillin 2gm IV 4 hrly Duration 2 weeks		
Meningitis-Post-neurosurgery or Penetrating head trauma	*S. epidermidis, S. aureus, P. acnes, P. aeruginosa, A. baumanii*	Meropenem 2gm IV 8hourly And Vancomycin15mg/kg IV 8hourly For 14days.		May need intraventricular therapy in severe cases

Meningitis with basilar skull fractures	*S. pneumoniae, H. influenzae*	Ceftriaxone 2gm IV 12hourly For 14 days		Dexamethasone 0.15mg/kg IV 6hourly for 2-4days (1st dose with or before first antibiotic dose)
Brain abscess, Sub dural empyema	Streptococci, Bacteroides, Enterobacteriaceae, *S.aureus*	Ceftriaxone 2gm IV 12 hourly or Cefotaxime 2 gm IV 4-6hourly AND onidazole 800mg IV 8hourly Duration of treatment to be decided by clinical & radiological response, minimum two months required.	2nd line Meropenem 2gm IV 8hourly Add Vancomycin 2gm/ day IV , 12 hrly if MRSA suspected	Exclude TB, Nocardia, Aspergillus, Mucor (If fungal etiology confirmed, Add Amphotericin B/ Voriconazole) If abscess <2.5cm & patient neurologically stable, await response to antibiotics. Otherwise, consider aspiration/surgical drainage and modify antibiotics as per sensitivity of aspirated/ drained secretions.
Neurocysticercosis	*Taenia solium*	Albendazole 400mg/Kg PO BD + Prednisolone 1mg/Kg PO OD Duration 15 days		Consider antiepileptic therapy for seizures

Skin and soft tissue infections:

Condition	Likely Causative Organisms	Empiric antibiotics (presumptive antibiotics)	Alternative antibiotics	Comments
Cellulitis	*Streptococcus pyogenes* (common), *S.aureus*	Amoxicillin-Clavulanate 1.2 gm IV TDS/625mgoral TDS or Ceftriaxone2gm IVOD	Clindamycin 600-900mg IV TDS	Treatfor5-7days.
Furunculosis	*S.aureus*	Amoxicillin-Clavulanate1. 2gmIV/Oral6 25TDS or Ceftriaxone2gm IVOD Duration–5- 7days	Clindamycin 600-900mg IV TDS	Get pus cultures before starting antibiotics
Necrotizing fasciitis	*Streptococcus pyogenes, S.aureus,* anaerobes, Enterobacteriaceae (polymicrobial)	Piperacillin-Tazobactam 4.5gm IV 6 hourly Or Cefoperazone-Sulbactam 3gm IV 12 hourly & Clindamycin 600-900mg IV 8 hourly Duration depends on the progress	Imipenem 1g IV 8 hourly or Meropenem 1gm IV 8 hourly AND Clindamycin 600-900mg IV TDS /linezolid600 mg IV BD/daptomycin 6mg/kg/day	Early surgical intervention crucial

Respiratory tract infections:

Condition	Likely Causative Organisms	Empiric antibiotics (presumptive antibiotics)	2nd line antibiotics	Comments
Community acquired Pneumonia	*S. pneumoniae, H. influenzæ,* Legionella, *E. coli, Klebsiella sp., S. aureus*	<u>Mild cases:</u> Amoxycillin-clavulanic acid <u>Moderate to severe cases</u> If IV indicated, amoxycillin-clavulanate 1.2g IV TDS or Ceftriaxone 1g IV BD + Levofloxacin	Piperacillin-Tazobactam 4.5gm IV 6hourly or Imipenem 1g IV 6hourly Or Cefoperazone-Sulbactam 3gm IV 12hourly	Reserve drugs: Linezolid + Vancomycin If MRSA is a concern, add Vancomycin If atypical pneumonia suspected, Azithromycin 500

		500mg OD x 5-7 days		mg oral/IV OD Or Doxycycline 100mg BD
Lung abscess, Empyema	*S.pneumoniae, E.coli, Klebsiella sp., Pseudomonas aeruginosa, S.aureus,* anaerobes	Piperacillin-Tazobactam 4.5gm IV 6 hourly Or Cefoperazone-Sulbactam 3gm IV 12hourly	Add Clindamycin 600-900 mg IV 8 hourly	3-4 weeks treatment required
Acute pharyngitis	Viral	None required		As most cases are viral no antimicrobial therapy required
	Group A ß-hemolytic Streptococci (GABHS), Group C, G Streptococcus,	*Oral Penicillin v 500mg BD or Amoxicillin 500mg Oral TDS for 10days*	*In case of penicillin allergy: Azithromycin 500mg OD for 5 days Or Benzathine Penicillin 12 lac units IM*	*Antibiotics are recommended to reduce transmission rates and prevention of long term sequaelae such as rheumatic fever*
Ludwig' s angina Vincent's angina	Polymicrobial (Cover oral anaerobes)	Clindamycin 600mg IV 8hourly or Amoxicillin-Clavulanate 1.2 gm IV	Piperacillin-Tazobactam 4.5gm IV 6hourly	Duration based on improvement
Acute bacterial Rhino sinusitis	Viral, *S. pneumoniae, H. influenzae, M. catarrhalis*	Amoxicillin-Clavulanate 1 gm Oral BD for 7days	Moxifloxacin 400mg OD for 5-7days	
Acute bronchitis	Viral	Antibioticsnot Required	-	-
Acute bacterial exacerbation of COPD	*S. pneumoniae H. influenzae M. catarrhalis*	Amoxicillin-clavulanate 1gm oral BD for 7 days	Azithromycin 500mg oral OD × 3days	Treated as community acquired pneumonia
Ventilator associated pneumonia		Piperacillin + Tazobactam 4.5gm 6 hourly	Meropenem 1gm 8 hourly + colistin 3miu	Check for Multiple organ failure Nephrotoxic

URINARY TRACT INFECTIONS

Asymptomatic bacteriuria NOT to be treated except pregnant women and immunocompromised patients. All cases of dysuria may not be UTI. Refer to Obstetrics and gynaecology infections for treatment of asymptomatic bacteriuria in pregnant women.

Condition	Likely Causative Organisms	Empiric antibiotics (presumptive antibiotics)	Alternative antibiotics	Comments
Acute uncomplicated Cystitis	*E.coli*, *Staphylococcus saphrophyticus* (in sexually active young women), *Klebsiella pneumoniae*	Nitrofurantoin 100mg BD for 7 days or Cotrimoxazole 960mg BD x 3-5 days or Ciprofloxacin 500mg BD for 3-5	Cefuroxime 250mg BD for 3-5days	Get urine cultures before antibiotics & modify therapy based on sensitivities.
Acute uncomplicated Pyelonephritis	*E.coli*, *Staphylococcu s saphrophyticus* (in sexually active young women), *Klebsiella pneumoniae, Proteus mirabilis*	Amikacin1gODI M/IV Or Gentamicin 5-7 mg/kg/day OD (Monitor renal function closely and rationalise according to culture report) Complete total	Piperacillin-Tazobactam 4.5g IV 6 hourly Or Cefoperazone-Sulbactam 3g IV 12hourly or Ertapenem 1g IV OD	Urine culture and susceptibilities need to be collected before starting antimicrobial treatment to guide treatment.
Complicated Pyelonephritis	*Escherichia coli, Klebsiella pneumonia, Proteus mirabilis, Pseudomonas aeruginosa, Enterococcus* sp. Frequently multi-drug resistant organisms are present	Piperacillin-Tazobactam 4.5 gm IV 6 hourly or Amikacin 1g OD IV Or Cefoperazone-Sulbactam 3gm IV 12hourly	Imipenem 1g IV 8hourly or Meropenem 1gm IV 8hourly	Get urine cultures before antibiotics & switch to a narrow spectrum agent based on sensitivities. Treat for 10-14days. De-escalate to Ertapenem 1gm IV OD, if Imipenem/ meropenem initiated. Monitor renal function if aminoglycoside is used.

Acute prostatitis	Enterobacteriaceae (*E.coli, Klebsiella sp.*)	Doxycline100mg BD or Co-trimoxazole960mg BD.	In severe cases, Piperacillin-Tazobactam 4.5gm IV 6 hourly or Cefoperazone-sulbactam 3gm IV 12hourly or Ertapenem 1gm IV OD or Imipenem 1g IV 8hourly or Meropenem 1gm IV 8hourly	Get urine and prostatic massage cultures before antibiotics& switch to narrow spectrum agent based on sensitivities and then treat total for 3-4 weeks. Use Ciprofloxacin (if sensitive)

OBSTETRICS AND GYNAECOLOGICAL INFECTIONS

- Fluoroquinolones are contraindicated in 1st trimester.
- Cotrimoxazole is contraindicated in 1st trimester.
- Doxycycline is not recommended in nursing mothers. If need to administer doxycycline discontinuation of nursing may be contemplated.

Infections	Likely organism	Primary treatment (presumptive antibiotics)	Alternate treatment	Remarks
Asymptomatic Bacteriuria >1,00,000cfu/ml of bacteria of same species in 2 urine cultures obtained 2-7 days apart. Treat as per sensitivity result for 7 days.		Nitrofurantoin 100mg Oral, BD for 7days Or Amoxicillin 500mg Oral BD x 7-10days.	Oral cephalosporins, TMP-SMX or TMP alone	Screen in 1st trimester. Can cause pylonephritis in upto 25% of all pregnant women. 30% Chance of recurrence after empirical therapy1. Few direct effects, uterine hypoperfusion due to maternal anemia dehydration, may cause fetal cerebral hypoperfusion. 2. LBW,
Group B streptococcal Disease, Prophylaxis and Treatment	Group B Streptococci	IV Penicillin G 5 million units. (Loading dose) then 2.5-3 million units IV QID until delivery. or Ampicillin 2gm IV (Loading dose) then 1gm QID until delivery	Cefazolin 2 gm IV (Loading Dose) and then 1gm TID Clindamycin 900mg IV TID or vancomycin IV or teicoplanin for penicillin allergy	Prevalance very low so the prophylaxis may be required only on culture documented report Associated with high risk of pre-term labour, stillbirth, neonatal sepsis
Chorioamnionitis	Group B streptococcus, Gram negative bacilli, chlamydiae, ureaplasma and anaerobes, usually Polymicrobial	Clindamycin/ vancomycin/ teicoplanin and cefoperazone-sulbactum If patient is not in sepsis then IV Ampicillin	Preterm Birth, 9-11% death rate in preterm infant's unfavourable neurologic utcome, lesser risk to	
Septic abortion	Bacteroides, *Prevotella bivius,* GroupB, GroupA Streptococcus, Enterobactereaceae, *C. trachomatis,*	Ampicillin 500mg QID+ Metronidazole 500mg IV TDS if patient has not taken any prior antibiotic (start	Ceftriaxone2g IV OD	

	Clostridium perfringens.	antibiotic after sending cultures) If patient has been		
		Partially treated with antibiotics, send blood cultures and start Piperacillin-Tazobactam or Cefoperazone-sulbactam till the sensitivity report is available.		
Endomyometritis and Septic Pelvic Vein Phlebitis	Bacteroides, Prevotella bivius, GroupB, Group A Streptococcus, Enterobactereacea e, *C.trachomatis, Clostridium perfringens*		Same as above.	
Obstetric Sepsis during pregnancy	Group A beta-haemolytic Streptococcus, *E.coli*, anaerobes.	If patient is in shock and blood culture reports are pending, then start Piperacillin-Tazobactam or Cefoperazone-sulbactam till the sensitivity report is available and modify as per the report. If patient has only fever, with no features of severe sepsis start amoxicillin clavulanate oral 625 TDS/ IV 1.2gm TDS or Ceftriaxone 2gm IV OD + Metronidazole500 mg IV TDS +/- gentamicin 7mg/kg/day OD if admission needed. MRSA cover may be required if suspected or colonized (Vancomycin/ Teicoplanin)		

Obstetric Sepsis following pregnancy	*S.pyogenes, E.coli, S.aureus S.pneumoniae*, Meticillin-resistant *S. aureus* (MRSA), *C. septicum* & *Morganella morganii.*	Same as above		Sources of sepsis outside Genital tract Mastitis UTI Pneumonia Skin and soft tissue (IV site, surgical site, drain site etc.)
Syphillis				Refer to STD program guidelines
Tuberculosis in pregnancy	**Similar to NON PREGNANT Population with**	Please refer RNTCP guideline WHO has advocated that, all the first line drugs are	Very small chance of transmission of infection to fetus.	
	Some exceptions (see comment and chapter 8)	Safe in pregnancy and can be used except streptomycin. SM causes significant ototoxicity to the fetus (Pyrazinamide not recommended by USFDA) 1. Mother and baby should stay together and the baby should continue to breastfeed. 2. Pyridoxine supplementation is recommended for all pregnant or breast feeding women taking isoniazid as well as to neonate who are being breastfed by mothers taking INH.	Late diagnosis can predispose to LBW, prematurity.	

VIRAL INFECTIONS (NO ANTIBIOTICS TO BE GIVEN)

Influenza In pregnancy (seasonal And H1N1)	1. Tendency for severe including premature labor & delivery. 2. Treatment should begin within 48 hrs of onset of symptoms. 3. Higher doses commonly used in non pregnant population (150mg) are not recommended in pregnancy due to safety concerns. 4. Chemoprophyl axis can be used in significant exposures. 5. Live (nasal Vaccine) is contraindicate d in pregnancy.	Oseltamivir 75 mg Oral BD for 5 days	Nebulization with Zanamvir respules (2) 5mg each, BD For 5 days	Direct fetal infection rare Preterm delivery and pregnancy loss. The best preventive strategy is administration of single dose of killed vaccine.
Varicella	>20 wks of gestation, presenting within 24 hours of the onset of the rash, >24hrs from the onset of rash, antivirals are not found to be useful.	Aciclovir 800mg Oral 5 times a day IV acyclovir recommended for the treatment of severe complications, VZIG should be offered to susceptible women <10days of the exposure. VZIG has no role in treatment once the rash appears. The dose of VZIG is 125units/10kg not exceeding 625 units, IM.	Chickenpox during pregnancy does not justify termination without prior prenatal diagnosis as only. a minority of fetuses infected develop fetal varicella syndrome.	

PARASITIC INFECTIONS

Acute Toxoplasmosis in pregnancy	<18 weeks gestation at diagnosis	Spiramycin 1gm Oral qid until 16-18weeks/ Pyrimathamine+ sulphadizine. Alternate every two weeks–		
	>18 weeks gestation and documented fetal infection by positive amniotic fluid PCR.	If PCR Positive - Pyremethamine 50 mg Oral BDx 2days then 50 mg OD + Sulphadiazine75 mg/kg Oral x 1dose then 50mg/kg bd + Folinic Acid (10-20 mg Oral daily) for minimum of 4 weeks or for duration of pregnancy.		
Malaria In pregnancy	As per national program			

GENITAL TRACT INFECTIONS

Candidiasis	Candida species	Fluconazole oral 150 mg single dose For milder cases- Intravaginal agents as creams or suppositories clotrimazole, miconazole, nystatin. Intravaginal azoles, single dose to 7-14days.	Non-pregnant-If recurrent candidiasis, (4 or more episodes/year) 6 months suppressive treatment with fluconazole 150mg oral once a week or clotrimazole vaginal suppositories 500mg once a week.	
Bacterial vaginosis	Polymicrobial	Metronidazole 500mg Oral BD x 7days Or metronidazole vaginal gel 1HS x 5days Or Tinidazole 2g orally ODx 3days Or 2% Clindamycin Vaginal cream 5gm HS x5 days	Treatthepartner.	
Trichimoniasis	Trichomonas vaginalis	Metronidazole 2gm single dose or 500mg Oral BD x 7days or Tinidazole 2gm Oral single dose For treatment failure –retreat with Metronidazole 500mg Oral BD x7Days, if 2nd failure Metronidazole 2gm Oral OD x3-5days	Treat sexual partner with metronidazole 2gm single dose	
Cervicitis /Urethritis Mucopurulent gonoccocal	Polymicrobial	Ceftriaxone 250mg IM Single dose + Azithromycin 1gm single dose OR Doxycycline 100mg BD x7day		
Pelvic Inflammatory Disease (Salpingitis & tubo-ovarian abscess)	*S.aureus,* Enterobacteriacae, gonococci, Gardenella	Out patient treatment Ceftriaxone 250mg IM/IV single dose plus+/- Metronidazole 500mg BD	Drainage of tubo-ovarian abscess wherever indicated Evaluate and treat sex partner	

		x14days Plus Doxycycline 100mg BD x 14Days Inpatient Treatment Clindamycin + ceftriaxone till patient admitted then change to OPD treatment		
Mastitis without abscess	*S. aureus*	Amoxycillin clavulunate/ Cephalexin 500m gQID/ OR Ceftriaxone 2gm OD OR MRSA- based on sensitivities Add Clindamycin 300QID or Vancomycin Igm IV 12hourly /teicoplanin 12mg/kg IV 12hourly x3 doses followed by 6 mg once daily IV		
Mastitis with abscess		Drainage with antibiotic cover for MRSA Clindamycin 300 QID or Vancomycin 15mg/kgIV12hourl y (maximum 1gm 12hourly)/ teicoplanin 12mg/kg IV 12hourly x 3doses followed by 6 mg once daily IV		

BONES AND JOINT INFECTIONS

Condition	Likely causative Organisms	Empiric antibiotics	Alternative antibiotics	Comments
Acute osteomyelitis OR Septic arthritis	*S.aureus, Streptococcus pyogenes* Enterobacteriaceae	Ceftriaxone2gIVOD FollowedbyOraltherapybyCl oxacillin 500mg q8h Or Cephalexin 500mg q6h	Piperacillin-tazobactam 4.5g mIVq6hor Cefoperazone-sulbactam 3gm IV q12h AND Clindamycin600-900mgIVTDS	Treat based on culture of blood/ synovialfluid/ bone biopsy Orthopedic Consultation is essential for surgical debridement Duration: 4-6 weeks (From initiation or last major debridement)
Chronic Osteomyelitis OR Chronic synovitis		No empiric therapy		Definitive treatment guided by bone/ synovial biopsy culture. **Treat for 6 weeks minimum** Investigate for TB, Nocardia, fungi. Extensive surgical debridement. Total duration of treatment depends on the joint and the organism. Choose antibiotic based on sensitivity.
Prosthetic joint infection	Coagulase negative staphylococci, *Staphylococcus aureus*, Streptococci Gram-negative bacilli, *Enterococcus*, Anaerobes	Ceftriaxone 2g IV OD. Add Vancomycin 1gm IV BD or Teicoplanin 800mg x3 doses followed by 400mg Once daily		4 weeks

OPHTHALMIC INFECTIONS

Eye lid infections	Likely organisms	First line/ Suggested Regimen	Alternate regimen	Remarks
External Hordeolum (Stye)	*S. aureus*	Hot pack Topical and oral antibiotic e/d and e/o in some cases incision and drainage of the stye.	Amoxicillin 500 mg PO QDS x 5 days Or Ampiclox (250 mg each) PO TDS x 5 days	if associated conjunctivitis Gatiflox 0.3% / Moxifloxacin 0.5% e/d QDS x 1 week
Internal Hordeolum				
Blephritis	MSSA/ *S. epidermidis*	Oral Cloxacillin 250-500mg QID or Oral Cephalexin 500mg QID	Lid margin care with baby shampoo & warm compresses 24hourly. Artificial tears if associated with dry eye.	
	MRSA	Oral Trimethoprim Sulphamethoxazole 960 mg BD or Linezolid 600mg BD		
Conjunctival infections				
Viral conjunctivitis (pinkeye)		No antibiotics required treat for symptoms		Highly contagious. If pain & photophobia suggestive of keratitis.
Bacterial conjunctivitis	*S.aureus, S.pneumoniae, H.influenzae*	Ophthalmologic solution: Gatifloxacin 0.3%, Levofloxacin 0.5%, Moxifloxacin 0.5% 1-2 drops q2h while awake during 1st2days, then q4-8h up to 7days		Uncommon causes- Chlamydia trachomatis N. gonorrhoeae
Corneal infections				
Herpes Simplex keratitis	H. simplex type 1 & 2	Trifluridine ophthalmic soln 1drop 2hourly, upto 9times/day until re- epithilised. Then 1 drop 4hourly upto 5times/ day for total duration of 21days	Ganciclovir 0.15% ophthalmic gel for acute herpitic keratitis.	Flurescine staining shows topical dendritic figures. 30-50% recur within 2yr.
	Varicella–			

	zostervirus	Famciclovir 500mg BD Or TID OR Valacyclovir 1gm oral TID x10 days	Acyclovir800mg5time s/dx10days	.
Varicella Zoster ophthalmicus				
Acute bacterial keratitis (No comorbidities)	*S.aureus, S.pneumoniae, S.pyogenes, Haemophilus spp*	Moxifloxacin topical (0.5%): 1drop 1hourly for first 48hr, then reduce as per response	Gatifloxacin 0.3% ophthalmic Solution 1drop 1hourly for 1st 48hrs then reduceas per response	Moxifloxacin. Preferable. Treatment may fail against MRSA.
Acute Bacterial (Contact lens users)	*P. aeruginosa*	Tobramycin or Gentamicin 14mg/ml+ Piperacilin or Ticarcillin eye drops (6-12mg/mL) q15-60 min around	Ciprofloxacin ophthalmic 0.3% or Levofloxacin Ophthalmic 0.5%	
Fungal keratitis	Aspergillus, Fusarium, Candida and others	Natamycin (5%)1drop1-2 hourlyforseveraldays,then3-4hourlyforseveralddays dependingonresponse	Amphotericin B (0.15%) 1drop q1-2 hourly for several days depending on the response	Empirical therapy is not recommended.
Protozoan (soft contact lens users)	Acanthamoeba spp.	Optimal regimen uncertain Suggested– (Chlorhexidine 0.02% or Polyhexamethylene biguanide 0.02%)+ (Propamidineisethionate 0.1% or Hexamidine 0.1%) eye drops 1 drop every 1 hourly during daytime, Taper according to clinical Response	-	Uncommon. & soft contact Lenses are risk factors
Orbital infections				
Orbital cellulitis	*S.pneumoniae, H.influenzae, M.catarrhalis, S.aureus,* Anaerobes, GroupA Streptococcus, Occasionally Gram Negative bacilli post trauma.	Cloxacillin 2gm IV q4h+ Ceftriaxone 2gm IV q24 hourly+ Metronidazole 1gm IV 12h	If Pencillin /Cephalosporin allergy: Vancomycin 1gm iv q12h+ levofloxacin 750mg IV once daily+ Metronidazole iv 1gm 24h	If MRSA is suspected substitute Cloxacillin with Vancomycin
Endophthalmits	*S.epidermidis S.aureus,*	Immediate ophthalmological	Adjuvant systemic antibiotics	.

Bacterial Post-ocularsurgery	Streptococci, enterococci, Gram-bacilli	consultation. Immediate vitrectomy+ Intravitreal antibiotics (Inj Vancomycin+ Inj ceftazidime)	(doubtful value in post cataract surgery endophthalmitis) Inj Vancomycin+ Inj Meropenem	
Hematogenous	*S.pneumoniae, S.aureus,* GroupB streptococcus, *K. pneumoniae N meningitidis*	Intra vitreal antibiotics Inj Vancomycin+ Inj Ceftazidime + Systemic antibiotics Inj Meropenem 1gm iv q8h/Inj Ceftriaxone 2gm iv q24h+ Inj Vancomycin 1g iv q12h		
Endophthalmitis Mycotic (Fungal)	Candida sp, Aspergillus sp.	Intavitreal amphotericinB 0.005-0.01mg in 0.1 ml Systemic therapy: AmphotericinB 0.7-1mg/kg+ Flucytosine 25mg/kg qid	Liposomal AmphotericinB 3-5mg/kg Or Voriconazole	Duration of treatment 4-6 week sor longer depending upon clinical response. Patients with chorioretinitis and ocular involvement other than endophthalmitis often respond to systemically administered

EAR, NOSE AND THROAT INFECTIONS

Ear infection	Likely Etiology/	Suggested Regimen	Alternate	Remarks
Malignant otitis externa	*P. aeruginosa* (in >90% cases)	Piperacilin + Tazobactam 4.5gm IV 6h Or Imipenem/ Meropenem Ciprofloxacin	Ceftazidime	Debridementusuallyrequired.Ruleoutosteomyelitis;DoCTorMRI,Ifbone involved,treatfor4-6 wks.
Acute otitis media	S.*pneumoniae* *H.influenzae* *Morexella catarrahalis*	Amoxicillin+clavulanate 90/6.4mg / kg/ daybidor cefpodoxim/ cefuroxime Axetil 250mg BD	Ceftriaxone 50mg/kg I/M for 3days	Treat children <2years If >2 years, a febrile and No ear pain-consider analgesics and defer antibiotics Duration of treatment If age<2 years:10days If age>2years:5-7 days
Mastoiditis				
Acute	S.*pneumoniae* *S.aureus* *H.infiuenzae* *P.aeruginosa*	Cefotaxime 1-2gm iv 4-8 Hourly Ceftriaxone 2gm iv OD		Modify as per culture Unusual causes-Nocardia, TB, Actinomyces.
Chronic	Polymicrobial	Piperacillin-tazobactam 4.5g IV8h Meropenem 1gm iv 8h		
Acute Pharyngitis/ tonsillitis				
Exudative/ Diffuse Erythema	Mostlyviral Group A,C, GStreptococcus, Infectiousmononucleosis,	PenicillinVoralx10daysorBenzathinePenicillin1.2MUIMx1doseorCefdiniror cefpodox ime x5days		Penicillinallergic, Clindamycin300-450 mgorally6-8hourlyx5days.Azithromycinclarithromycinare alternatives.
Membranous pharyngitis	*C.diptheriae,*	Erythromycin500mgIVQI DorPenicillinG50,000units /kgIV12hourly. Diptheriaantitoxin: Horses erum. <48hrs:20,000-40,000units,Nasoph		

		aryngeal membranes:40,000- 60,000units >3days&bull neck:80,000-1,20,000units		
Epiglotitis (Supraglotis)	Children: *H.influenzae, S.pyogenes, S.pneumoniae ,S.aureus.*	Cefotaxime 50mg/kg IV 8hourly or ceftriaxone 50mg/kg IV 24 hourly	Levofloxacin 10mg/kg IV 24hourly+ clindamycin 7.5mg/kg IV 6hourly.	
Laryngitis (hoarseness)	Viral (90%)	No antibiotic indicated		

FUNGAL INFECTIONS

Routine antifungal prophylactic therapy in critically ill patients is NOT recommended. Fungal therapy is usually started based on positive cultures or systemic evidence of fungal infection. It is advised to take paired cultures if fungal infection is suspected. Evidence includes persistent sepsis / SIRS despite broad spectrum antibiotic (exclude sepsis, abscess, drug fever, DVT etc). Treat according to identification and antifungal sensitivity of Candida isolate.

Fluconazole IV/oral 800 mg OD first day (12mg/kg) and then 400 mg OD (6mg/kg from second day) if fluconazole naïve or sensitive

Or

2nd line Liposomal Amphotericin B (for Candida krusei and C.glabrata as inherently resistant to Fluconazole.) or Caspofungin (As Caspofungin is inherently inactive against Zygomycetes, Cryptococcus, Fusarium and TrichosporonSpp) Liposomal Amphotericin B IV 3mg/kg OD or Caspofungin dose: IV 70mg on Day 1 (loading), 50mg OD (<80kg) or 70mg OD (if >80kg) thereafter.Moderate to severe hepatic dysfunction: reduce the subsequent daily dose to 35mg OD. Check for drug interactions.

To be decided by Microbiologist/ID physician based on patient's hepatic / renal functions/Severity of infection /drug interactions e.g. rifampicin, carbamazepine, phenytoin, efavirenz, nevirapine, cyclosporin, dexamethasone, tacrolimus etc.

POST-CARDIOVASCULAR SURGERY INFECTIONS

Surveillance regarding the Infections following CTVS should be done in each institute

1. Antibiotic Prophylaxis to be guided by the institutional prevalence of MRSA infection and in patients at increased risk for MRSA colonization
2. Nasal screening before CTV surgery is recommended to rule out MRSA colonization

Sl. no.	Surgery	Antibiotic Prophylaxis			Comments
		1st line	2nd line	Special Antibiotic/ Combination	
1.	CABG	Cefazolin	Cefuroxime	-	Vancomycin/ Teicoplanin to be used in case of high prevalence of MRSA infections only Using only Vancomycin/Teicoplanin is NOT recommended due to lack of coverage of GNB Vancomycin infusion to be given over 1 hour & to be started 2 hrs before the surgical incision Teicoplanin dosing to start with 800 mg x 3 doses and then 6 mg/kg to complete prophylxis Duration of Prophylaxis: Continued till 48 hours after the surgery

Empirical Treatment after appropriate specimen for stain & cultures have been collected

Sl. no.	Infection/ Syndrome	Likely Causative agents	Antibiotics			Comments
			1st line	2nd line	Special Antibiotic/ Combination	
1	Sternotomy site infection	Not known	BL-BLI (Piperacillin-tazobactam, Cefoperazone-sulbactam, cefipime-tazobactam) with or without amikacin. With Vancomycin/ teicoplanin	Daptomycin/ Linezolid with carbapenem	Consider de-escalation to TMP/SMX , doxy/minocycline, cloxacillin, cefazolin, If these are sensitive	Removal of the foreign body (steel wires) should be considered
2	Infection of vascular catheters	Not known	BL-BLI (Piperacillin-tazobactam, Cefoperazone-sulbactam, cefipime-tazobactam) with or without amikacin with Vancomycin/ teicoplanin	Carbapenem (Empirical anti-MRSA drug if the incidence of MRSA CRBSI is high)		Consider de-escalation as per the isolate, susceptibility, MICs, adverse effects, drug allergy
3	Pneumonia	Not known	BL-BLI (Piperacillin-tazobactam, Cefoperazone-sulbactam) with or without amikacin	Carbapenem		Consider de-escalation as per the isolate, susceptibility, MICs, adverse effects, drug allergy
4	Mediastinitis	Not known	BL-BLI (Piperacillin-tazobactam,	Carbapenem with or without		Consider de-escalation as per the isolate,
			Cefoperazone-ulbactam) with or without amikacin With Vancomycin/ teicoplanin	Amikacin		susceptibility, MICs, adverse effects, drug allergy
5	Urinary tract infection	Not known	BL-BLI (Piperacillin-tazobactam, Cefoperazone-sulbactam with or without amikacin	Carbapenem with or without		Consider de-escalation as per the isolate,
				Amikacin		susceptibility, MICs, adverse effects, drug allergy

Definitive Treatment after appropriate specimen for stain & cultures have been collected

Sl. no.	Infection/ Syndrome	Likely Causative agents	Antibiotics			Comments
			1st line	2nd line	Special Antibiotic/ Combination	
1	Sternotomy site infection	Coagulase Negative Staphylococci	Vancomycin, Teicoplanin	Daptomycin Linezolid	Consider de-escalation to Cotrimoxazole or Cloxacillin or Cefazolin Consider de-escalation to TMP/SMX or doxy/minocycline If these are sensitive	1) Consider MICs, risk of nephrotoxicity, bone penetration for choosing the antibiotic 2) Removal of the foreign body (steel wires) should be considered 3) Longer duration of duration – 6- 12 months may be required For Candida osteomyelitis, longer duration of treatment (12 months) is recommended
		MRSA	Vancomycin, Teicoplanin,			
		Enterococcus	Vancomycin, Teicoplanin,	Daptomycin Linezolid	Consider de-escalation to Ampicillin/ Ampi-sulbactam	
		GNB (Enterobacteri--acae, Pseudomonas, Acinetobacter)	BL-BLI (Piperacillin-tazobactam, Cefoperazone - sulbactam, with or without amikacin	Carbapenem (Meropenem, Imipenem)	Consider de-escalation to oral agent if possible after 2-6 weeks of antibiotic therapy	
		Candida	L-AmB/AmB-d for 3 weeks followed by Fluconazole (If susceptible)		De-escalation to Fluconazole 800 mg loading followed by 200 mg BD	

FEBRILE NEUTROPENIA

Febrile Neutropenia-definition

- Neutropenia-ANC<500/mm^{3}and expected to fall below 500/mm^3 in 48hrs
- Fever-single oral temperature of 38.3°C(101°F) on one occasion or 38°C (100.4°F) on atleast2 occasions (1 hour apart)
- Neutropenic patients may not have usual signs of infection. Redness, tenderness and fever may be the only signs.

Protocol:

- Critical examination of areas usually harboring infections, including but not limited to, oral cavity, axillary region, scalp, groin, perineal region.
- Send blood Cultures 2 sets (each bottle 10ml x 4 bottles)
- Other relevant investigations: urea, creatinine, ALT, urine culture ,Chest Xray, separate culture from central line, etc.

Patient-Haemodynamically stable

- Blood culture 2 sets
- Start IV Ceftazidime 1gm IV 8 hourly
- No need to add glycopeptides in the initial regimen (except in specific situations, given below)

Patient-Haemodynamically unstable

- Start BL-BLI agent
  (Cefoperazone-Sulbactam
  1.2gm IV 8 hourly/ piperacillin-
  tazobactam 4.5gm IV 8 hourly)
  OR
  Carbapenem (meropenem 1gm
  IV 8 hourly/imipenem 500mg
  IV 6 hourly/doripenem 500mg
  IV 6 hourly)
- No need to add glycopeptides in the initial regimen (except in specific situations, givenbelow)

Reassess after 48 hours:

If blood cultures are negative, haemodynamically stable but still febrile

- Reculture blood
- Add amikacin 500mg IV BD for 3days
- Add colistin (instead of amikacin) if indicated (see below)
- If blood cultures are negative, haemodynamically unstable but still febrile
- Inj Colistin (+/-Carbapenem) + glycopeptides + Echinocandin/ L-AmphoB

Blood culture growing Gram negative bacilli

- Patient afebrile- continue the empirical antibiotic till antibiotic sensitivity is available.
- Rationalise as per susceptibility profiles

When to add glycopeptides?

- Haemodynamic instability,or other evidence of severe sepsis, septic shock or pneumonia
- Colonisation with MRSA or penicillin-resistant *S. pneumonia*
- Suspicion of serious catheter-related infection *e.g. chills or rigours within fusion through catheter and cellulitis around the catheter exit site*
- Skin or soft-tissue infection at any site
- Positive blood culture for gram-positive bacteria, before final identification and susceptibility testing is available
- Severe mucositis

When to add empirical colistin in febrile neutropenic patients?

- Heamodynamic instability.
- Colonisation with carbapenem resistant gram-negative bacteria.
- Previous infection with carbapenem resistant gram-negative bacteria.
- GNB in blood, sensitivity pending, persistent fever with haemodynamic instability.

Empirical Antifungal Therapy

- No response to broad spectrum antibiotics (3-5days)- add L-AmphoB/echinocandin
- When a patient is located at a remote area and may not have access to emergency healthcare services, febrile neutropenia can be life threatening. Under such circumstances, availability of broad-spectrum oral antibiotics with the patient can help them gain time to reach emergency healthcare service.

Useful tips

- Febrile after 72hrs- CT chest and consider empirical antifungal.
- If fever persists on empirical antibiotics, send two sets blood cultures/day for 2 days
- Send further cultures if clinical deterioration
- Unexplained persistent fever in otherwise stable patient doesn't require change in empirical antibiotic regimen.
- Continue the regimen till ANC is >500cells/mm^3
- If glycopeptides started as a part of empirical regimen, STOP after 48hrs, if no evidenc of Gram positive infection
- Antibiotic treatment should be given for atleast seven days with an apparently effective antibiotic, with atleast four days without fever.
- Once Neutrophil count has recovered, with no culture positivity and heamodynamically stable; antibiotics can be stopped and patient observed, even if remains febrile. Evaluate for fungal infection, ifatrisk.

Antibiotic Prophylaxis

Though quinolone prophylaxis is recommended by International guidleines, it is not useful in Indian scenario due to high resistance.

Antiviral prophylaxis

- For HSV IgG positive patients undergoing allo-HSCT or leukemia induction needs acyclovir prophylaxis
- All patients being treated for cancer need to receive annual influenza vaccination with an inactivated
- vaccine.
- Neutropenic patients presenting with influenza like illness should receive empirical treatment with neuraminidase inhibitor.

Antifungal prophylaxis

- Induction chemotherapy of Acute Leukemia: Posoconazole
- Post allo BMT
  Pre engraftment: Voriconazole/ echinocandin
  Post engraftment: Posoconazole

SURGICAL ANTIMICROBIAL PROPHYLAXIS

- To be administered within 1hr before the surgical incision.
- Single dose is recommended. Consider for second intra-operative dose in prolong surgery based on the choice of antibiotic used for prophylaxis.
- Prophylaxis should **not** be given beyond surgery duration (except for cardiothoracic surgery, upto 48 hours permissible)

SURGERY	MEDICATION
Breast	Inj.Cefazolin 2gm or Inj. Cefuroxime 1.5gm IV stat
Gastroduodenal & biliary	Inj. Cefaperazone-Sulbactam 2gm IV stat & BD for 24hrs (maximum)
ERCP	Inj. Piperacillin-Tazobactum 4.5 gm or Inj. Cefaperazone-Sulbactam 2 gm IV stat
Cardiothoracic	Inj. Cefuroxime 1.5gm IV stat & BD for 48 hrs
Colonic surgery	Inj. Cefaperazone-Sulbactam 2gm IV stat & BD for 24hrs (maximum)
Abdomina lsurgery(hernia)	Inj. Cefazolin2gmorInj.Cefuroxime 1.5gmIV stat
Head & Neck/ENT	Inj. Cefazolin2gmIVstat
Neurosurgery	Inj. Cefazolin 2gm or Inj.Cefuroxime 1.5gm IV stat
Obstetrics & Gynecology	Inj. Cefuroxime 1.5gm IV stat
Orthopaedic	Inj. Cefuroxime 1.5gm IV stat & BD for 24hrs (maximum) or Inj. Cefazolin 2gmIV stat Open reduction of closed fracture with internal fixation-Inj. Cefuroxime 1.5 gm IV stat and q12 h or Inj. Cefazolin 2gm IV stat and q12 h for 24hrs
Trauma	Inj. Cefuroxime 1.5gm IV stat and q 12h (for 24hrs) or Inj. Ceftriaxone 2gm IV OD
Urologic procedures	Antibiotics only to patients with documented bacteriuria
Trans-rectal prostatic surgery	Inj. Cefaperazone-Sulbactam 2 gm IV stat

Pediatric Infections

Diseases /Conditions	1st line Antibiotics (Who did not received antibiotic for the present condition)	1st line antibiotics (Received oral antibiotics for < 5 days)	2nd line Antibiotics (Received multiple or prolonged antibiotics)
Central Nervous System Infection			
Acute Bacterial Meningitis	Ceftriaxone ± Vancomycin (in Shock)	Ceftriaxone ± Vancomycin (in Shock)	Meropenem/ Cefepime + Vancomycin/ Teicoplanin
Brain abscess	Ceftriaxone + Vancomycin + Metronidazole	Ceftriaxone + Vancomycin + Metronidazole	Cefepime or Meropenem + Vancomycin
Shunt infection	Ceftriaxone + Vancomycin	Ceftriaxone + Vancomycin	Cefepime or Meropenem + Vancomycin
Acute encephalitis syndrome	Ceftriaxone ± Vancomycin + Acyclovir	Ceftriaxone ± Vancomycin + Acyclovir	Meropenem/Cefepi m e + Vancomycin/ Teicoplanin (add Azithromycin if atypical organisms suspected)

Respiratory Tract Infections			
Community acquired pneumonia Evidence of staph infection (± Shock)	Ceftriaxone + Amoxicillin-clavulanate Ceftriaxone + Vancomycin	Ceftriaxone+ Amoxicillin-clavulanate Ceftriaxone + Vancomycin	Piperacillin-tazobactam + Vancomycin
Atypical Pneumonia	Azithromycin	Azithromycin	Fluoroquinolones
Empyema	Amoxicillin-clavulanate	Amoxicillin-clavulanate (if already received in IV dose) then start Vancomycin + Ceftriaxone	Vancomycin + Cefoperazone-sulbactam
Cystic Fibrosis (CF)-pulmonary exacerbation	Cefoperazone-sulbactam/ Piperacillin-tazobactam+ Amikacin	Cefoperazone-sulbactam/ Piperacillin-tazobactam + Amikacin	Meropenem OR Ofloxacin OR Colistin + Vancomycin OR Linezolid
Suppurative lung disease	Cefoperazone-sulbactam+ Amikacin	Cefoperazone-sulbactam+ Amikacin	Piperacillin-tazobactam + Vancomycin
Immunodeficiency condition + LRTI	Cefoperazone-sulbactam+ Amikacin	Cefoperazone-sulbactam+ Amikacin	Piperacillin-tazobactam + Vancomycin
Infection related to Kidney and Urinary Tract			
Nephrotic syndrome with peritonitis	Ceftriaxone ± Vancomycin (in Shock)	Ceftriaxone ± Vancomycin (in Shock)	Teicoplanin + Piperacillin-tazobactam
Nephrotic syndrome with cellulitis	Amoxicillin-clavulanic acid OR Cloxacillin + Cefotaxime	Amoxicillin-clavulanic acid OR Cloxacillin + Cefotaxime	Teicoplanin + Piperacillin-tazobactam
Nephrotic syndrome with	Ceftriaxone ± Vancomycin (in Shock)	Ceftriaxone ± Vancomycin (in Shock)	Teicoplanin + Piperacillin-
pneumonia			tazobactam
Haemodialysis with suspected catheter related bloodstream infection	Ceftazidime + Vancomycin	Ceftazidime + Vancomycin	Remove line (place another after 48 hr; preferred) Piperacillin-tazobactam + Vancomycin
UTI (complicated)	Ceftriaxone	Ceftriaxone	Culture and sensitivity guided
Infection of Bone and Joints			
Acute Bacterial Osteomyelitis (Empirical) MSSA MRSA	Ceftriaxone + Vancomycin Cefazolin/Cloxacillin/Nafcill in Vancomycin or Clindamycin(If no Bacteremia and child is no		Ceftazidime/ Piperaci llin-tazobactam + Vancomycin

	severely ill)		
Septic Arthritis (Empirical) MSSA MRSA	Ceftriaxone + Vancomycin Cefazolin/ Cloxacillin/ Nafcill in Vancomycin or Clindamycin		Ceftazidime/ Piperaci llin-tazobactam + Vancomycin
Infections of Skin and Soft Tissues			
Cellulitis	Oral Amoxicillin-Clavulanate/ Cephalosporin/C lindamycin	Ceftriaxone/Cefazolin/Amoxi cillin-Clavulanate /Clindamycin (IV)	Vancomycin + Piperacillin – tazobactam
Infection of Gastrointestinal System			
Liver abscess	Cefazolin + Ceftriaxone	Vancomycin + Ceftriaxone	Teicoplanin + Meropenem
Acute Cholangitis	Piperacillin – tazobactam	Piperacillin – tazobactam	Meropenem
Infected pancreatic collection	Piperacillin – tazobactam	Piperacillin – tazobactam	Meropenem
Infection in Pediatric Intensive Care Unit (PICU)			
Sepsis without focus (community acquired)	Ceftriaxone	Ceftriaxone	Piperacillin-tazobactam + Vancomycin
Nosocomial Sepsis (Without focus)	Piperacillin-tazobactam + vancomycin	NA	Colistin + Vancomycin
Septic shock	Ceftriaxone + Vancomycin	Piperacillin-tazobactam + Vancomycin	Piperacillin-tazobactam /Cefoperazone-sulbactam +Vancomycin
Ventilator Associated Pneumonia	Piperacillin-tazobactam + Vancomycin	NA	Colistin ±/ Vancomycin
Suspected fungal pneumonia			Add fluconazole or amphotericin B
DKA with suspected sepsis	Ceftriaxone	Ceftriaxone	Piperacillin-Tazobactam+ Vancomycin
Meningococcal sepsis	Ceftriaxone	Ceftriaxone	Piperacillin-Tazobactam+ Vancomycin
Central line associated Blood stream Infection	Vancomycin	Meropenem	Colistin ± vancomycin
Infection in Immunocompromised Children			
Febrile Neutropenia (No focus)	Cefoperazone-sulbactam/ Piperacillin-tazobactam + Amikacin	NA	Add/increase gram positive cover (Vancomycin/ Linezo lid)
FN-Pneumonia	Amoxicillin-clavulanate + Amikacin	Cefoperazone-sulbactam + Amikacin ± Vancomycin/Linezolid	Meropenem + Vancomycin/Line zol id Add antifungals if

			fever persists > 5-7 days
FB-GIT	Cefoperazone-sulbactam + Ofloxacin/ Metronidazole	Add gram positive cover (Vancomycin/Linezolid)	Meropenem + Vancomycin/Linezol id Add antifungals if fever persists > 5-7 days
Febrile neutropenia with shock	Cefoperazone-sulbactam/ Piperacillin-tazobactam + Vancomycin	NA	Meropenem + Vancomycin Add Amphotericin B (if fever persists >5-7 days)
FN-meningitis	Ceftriaxone + Vancomycin	NA	Meropenem + Vancomycin
Sepsis	Piperacillin-tazobactam + vancomycin Add Amphotericin- B in case of strong suspicion of fungal Infection	Piperacillin-tazobactam + vancomycin Add Amphotericin-B in case of strong suspicion of fungal infection	Colistin + Vancomycin Add Amphotericin-B
PCP Pneumonitis	Cotrimoxazole	Cotrimoxazole	
Infection in Neonatal Intensive Care Unit (NICU)			
Early-onset sepsis	Ciprofloxacin + Amikacin	NA	Piperacillin-tazobactam + Amikacin
Late-onset sepsis	Ciprofloxacin + Amikacin	NA	Piperacillin-tazobactam + Amikacin
Meningitis	Piperacillin-tazobactam+ Amikacin	NA	Meropenem + Amikacin
Sepsis (Community Acquired)	Cefotaxime + Amikacin	NA	Piperacillin-tazobactam + Amikacin
Osteomyelitis	Cefotaxime + Cloxacillin In MRSA replace Cloxacillin with Vancomycin		
Septic Arthritis	Cefotaxime + Cloxacillin In MRSA replace Cloxacillin with Vancomycin		

- The recommendations listed above are for empirical administration. Antibiotic usage should be de-escalated judiciously following the availability of culture- sensitivity reports.
- The duration shown denotes the length of treatment in case the empirical antibiotic is continued.