CRH SIKKIM MANIPAL UNIVERSITY

CENTRAL REFERRAL HOSPITAL - SMIMS

ANTIBIOTIC POLICY

ANTIBIOTIC GUIDELINES 2019

CENTRAL REFERRAL HOSPITAL

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INTRODUCTION

Antimicrobial resistance (AMR) has been detected in all parts of the world and currently it is one of the greatest challenges to global public health (WHO 2014). The threat is compounded by the lack of development of new antibiotics. A safe and effective strategy for antibiotic use involves prescribing an antibiotic only when it is needed and selecting an appropriate and effective agent at the recommended dose, with the narrowest spectrum of antimicrobial activity, fewer adverse effects and low cost.

The following information is intended to serve as a guide ,to aid in the selection of an appropriate antimicrobial for patients with infection commonly seen in clinical practice. The hospital antibiogram is reviewed every year and antibiotic recommendations are modified accordingly.

Guide to prudent antibiotic prescribing

- Prescribe antibiotic only if clinically indicated according to the patient's clinical signs and symptoms of infection and/ or sepsis.
- Always obtain culture before starting empiric antimicrobial treatment.
- Review the need of antimicrobials within 72 hours.
- Prescribe antimicrobials as per local up to date evidence based guidelines and local susceptibility pattern.
- If a patient is on IV therapy ,review and consider switching to oral therapy, depending on the clinical condition of the patient and diagnosis of infection .
- Review microbiology results and susceptibility testing of microorganisms and change therapy accordingly. Switch to narrow spectrum agents and prescribe antibiotic for the recommended duration as per local guidelines.

A. GASTROINTESTINAL & INTRA-ABDOMINAL INFECTIONS				
Condition	**Likely Causative Organisms**	**Empiric (Presumptive) antibiotics/ First Line**	**Alternative antibitics / Second Line**	**Comments**
Acute Gastroenteritis	Viral Entero-toxigenic & Entero-Pathogenic *E. coli*	None	None	Rehydration (oral / IV) essential
Acute watery diarrhoea (Cholera suspected)	*V. cholerae*	Doxcycline 300mg Oral Stat Azithromycin Oral in Children (20mg/Kg) and pregnant women (1g)	Azithromycin 1gm Oral stat or Ciprofloxacin 500mg BD for 3 days	Rehydration (oral / IV) essential Antibiotics are adjunctive therapy
Bacterial dysentery	*Shigella sp* *Campylobacter, Non- typhoidal Salmonellosis*	Ceftriaxone 2gm IV OD for 5 days or oral cefixime 10-15 mg/kg/day x 5days	Azithromycin 1g OD x 3 days	
Amoebic dysentery	*E. histolytica*	Metronidazole 400mg oral TDS for 7-10 days	Tinidazole 2gm Oral OD for 3 days	Add diloxanide furoate 500 mg TDS for 10 d
Giardiasis	*Giardia lamblia*	Metronidazole 250-500mg oral TDS x 7-10 days	Tinidazole 2gm oral x 1 dose	
Enteric fever	*S. Typhi* *S.Paratyphi A*	**Outpatients:** Cefixime 20mg/Kg /day or 14 days or Azithromycin 500mg BD for 7 days. **Inpatients:** Ceftriaxone 2g IV BD for 2 weeks +/- Azithromycin 500 mg BD for 7 days	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

Condition	Likely Causative Organisms	Empiric (Presumptive) antibiotics/ First Line	Alternative antibitics / Second Line	Comments
Cholangitis	Enterobacteriaceae Anaerobes	Piperacillin Tazobactam 4.5 g IV Q8H. Ertapenem 1g IV OD (for severely ill pts. -Sepsis or Septic Shock)	Cefoperazone sulbactam 3gm iv B.D.for 7 days	
Acute Cholecystitis	Enterobacteriaceae	Piperacillin Tazobactam 4.5 g IV Q8H	Cefoperazone sulbactam 3gm iv B.D.for 7 days	
Spontaneous bacterial peritonitis	***E.coli***	Piperacillin Tazobactam 4.5 g IV Q8H	Cefoperazone sulbactam 3gm iv B.D.for 7 days	
Secondary peritonitis (bowel perforation)	Enterobacteriaceae Anaerobes	Ertapenem 1gm iv od	Cefoperazone sulbactam 3gm iv B.D.for 7 days emergency surgery to eliminate source of contamination	
Intra abdominal abscess	Enterobactericeae anaerobes	Ertapenem 1gm iv od	Emergency drainage	
Acute pancreatitis			routine use of prophylactic antibiotics not recommended	
Liver abscess	Polymicrobial	Amoxycillin-clavulanate/3rd generation Cephalosporin +Metronidazole 500mg IV TID for 2 weeks	Piperacillin – Tazobactam IV	

B. CENTRAL NERVOUS SYSTEM INFECTIONS				
Condition	**Likely causative Organisms**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Acute bacterial Meningitis	*S. pneumoniae, H.influenzae, Neisseria meningitidis*	Ceftriaxone 2g IV 12hourly/ Cefotaxime 2g IV 4-6 hourly for 10-14 days	Meropenem 1gm IV 8 hourly	Antiobiotics should be started as soon as the possibility of bacterial meaningitis becomes evident. Ideally within 30 minutes. Do not wait for CT scan or LP results.
Brain abscess	*Streptococci, Bacteroides, Enterobacteriaceae, S.aureus*	Ceftriaxone 2g IV 12hourly or Cefotaxime 2g IV 4-6 hourly AND Metronidazole 1gm IV 12 hourly Duration of treatment to be decided by clinical and radiological response, minimum two moths required	Meropenem 2gm IV 8 hourly	

SEPSIS/SEPTIC SHOCK

Sepsis	*E.coli, Klebsiella,Enterobacter,Pseudomonas, Acinetobacter,S.aureus, Streptococcus spp*	Piperacillin-Tazobactam,Meropenem,Imipenem, or Colistin		To step down or modify according to c/s report

C. CARDIOVASCULAR INFECTIONS				
Condition	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Infective Endocarditis: Native valve	*Viridans streptococci, other Streptococci, Enterococci*	Penicillin G 2-3 millions unit , iv 4 hourly X 4 weeks 2. Ceftraxone 2gm iv OD x 4 -6 wks.+ Inj. Gentamycin		Modify antibiotics based on culture result and complete 4-6 weeks of antibiotics
Infective Endocarditis: Prosthetic valve awaiting cultures	*MSSA, Streptococcus , Enterococcus*	Vancomycin 15mg/kg IV 12 hourly (maximum 1g 12 hourly)/ Teicoplanin 12mg/kg IV 12hourly X 3 doses followed by 6-12 mg once daily IV depending upon severity + Gentamicin 1mg/kg q12h IV	Daptomycin can be used in place of Vancomycin/ Teicoplanin for patient unresponsive to or intolerant of Vancomycin/ Tei coplanin or with Vanocomycin/Gly copeptide-resistant isolates	Antibiotic choice as per sensitivity. Guidance from infectious disease specialist or microbiologist is recommended.

D. URINARY TRACT INFECTION				
Conditions	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Aternative antibiotics**	**Comments**
Acute uncomplicated cystitis & Urethritis ,	*E.coli,Staphylococcus saprophyticus(*in sexually active young women),*Klebsiella pneumoniae*	Nitrofurantoin 100 mg BD for 7 days or Cotrimoxazole 960mg BD for 3-5 days Fosfomycin 3gm OD single dose	Amoxyclav,Levofloxacin,Ciprofloxacin	
Asymptomatic Bacteriuria(positive urine culture from an individual without symptoms or signs of UTI)	*E.coli*	No antimicrobial treatment needed		Screening and treatment of Asymptomatic bacteriuria is indicated for a) Pregnant women b) Patients undergoing urologic procedure Nitrofurantoin 100mg BD for 7 days OR Cap Amoxicillin 500mg BD for 7 to 10 days OR Oral Cephalosporins
Pyelonephritis (Uncomplicated)	*E*.coli & Pseudomonas	Piperacillian+ Tazobactam 4.5gm IV 6 hourly OR Amikacin 1g OD IV OR Cefoperazone Sulbactam 3gm Iv 12hourly	Levofloxacin 750mg od	In pregnancy Inj.Ceftriaxone
Complicated UTI	*E.coli ,Proteus &Pseudomonas*	Meropenem 1gm IV tid	Levofloxacin,Amikacin.(based on culture)	
Foleys Catheter associated UTI	*E.coli & Pseudomonas*			No empiric treatment

E . RESPIRATORY TRACT INFECTIONS				
Condition	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Community acquired Pneumonia	*S. pneumoniae* *H. influenzae, E.coli, Legionella spp, Klebsiella spp*	Cefexime 200 mg oral BD for 7 to 10 days Azithromycin 500 mg oral Moxifloxacin 400mg oral/ IV OD for 7-10 days OR Levofloxacin 750mg oral or IV OD for 5 days		As Tuberculosis is endemic, in our country , use of Fluroquinolones has to be avoided. They have been kept reserved for MDR tuberculosis
Acute Bacterial Exacerbation of COPD	*S. pneumoniae* *H. influenzae,Moraxella*	Amoxyclav 625 mg oral TDS for 7 days OR Azithromycin 500 mg oral OD for 3 days	Cefpodoxime 200mg bid	
Acute Pharyngitis	*Group A Beta haemolytic Streptococci*	Amoxycillin 500 mg TDS for 10 days OR Azithromycin 500 mg OD for 5 days	Roxithromycin	

F . SKIN AND SOFT TISSUE INFECTIONS				
Conditions	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Cellulitis	*Staphylococcus aureus*	Amoxyclav 1.2gm IV TDS OR 625 mg oral TDS for 5-7 days Ceftriaxone 2gm IV OD for 5-7 days Clindamycin 600-900 mg IV TDS for 5-7 days		
Furuncles , Carbuncles , Cutaneous abscesses	*Staphylococcus aureus*	Tab Cloxacillin 500mg 6 hourly for 7 to 10 days		
Burn Wound Infections	*Pseudomonas spp, Staphylococcus aureus*	Piperacillin + Tazobactam 4.5 gm IV 6 hourly Cefazoline 1gm IV 8 hourly		
Necrotizing fascitis	*Strept. pyogenes , Staphylococcus aureus*	Piperacillin + Tazobactam 4.5 gm IV 6 hourly Cefoperazone Sulbactam 3gm IV 12 hourly		

G . BONE AND JOINTS INFECTIONS				
Conditions	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Acute Osteomyelitis	*Staph. aureus, Strept. pyogenes*	Ceftriaxone 2gm IV OD followed by oral therapy Cloxacillin 500mg 8 hourly Cephalexin 500 mg 6 hourly for 4-6 weeks		
Chronic Osteomyelitis	*Staph. aureus, aerobic GNB , Streptococci & Anaerobes*	No Empiric therapy		Definitive treatment guided by bone/synovial biopsy and culture.
Septic Arthritis	*Staph. aureus,*	Cefazolin 1gm IV 8 hourly for 3 weeks or Cloxacillin 500mg 8 hourly for 3 weeks OR Cefuroxime 250-500 mg oral for 3 weeks		

H. ENT INFECTIONS				
Conditions	**Likely causative organism**	**Emperic antibiotics (presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Acute otitis externa	***S. aureus*** ***H. influenzae***	1)Amoxicillin+clavulanate 40-60mg /kg/day or 2)cefuroxime axetil 30-50mg/kg/day	1)cefpodoxime 10 mg/kg/day **Or** **2) clindamycin 8-25mg/kg/day**	**Debridement/aural toileting** **and** **aural packing is the first line of treatment**
Malignant otitis externa	*P.aeruginosa* (in>90% cases)	1) ciprofloxacin 10-20mg/kg/dose 12th hourly Or 2)Piperacilin+Tazobactam 4.5gm IV 6h Or	Ceftriaxone 50 mg/kg/day	Debridement usually required. Rule out osteomyelitis; Do CT or MRI, If bone involved , treat for 4-6 wks.
Acute otitis media	*S.pneumoniae,* *H.influenzae,* ***M.catarrhalis***	1)Amoxicillin+clavulanate 40-60mg /kg/day TDS or 2)cefpodoxim 10 mg/kg/day or 3)cefuroxime axetil 30-50mg/kg/day	Ceftriaxone 50mg/kg I/V	Treat children <2 years If >2 years, afebrile and no ear pain- consider analgesics and defer antibiotics Duration of treatment If age <2 years: 10 days If age >2 years : 5-7 days
Chronic otitis media	*S.pneumoniae* *S.aureus,* *H.influenzae,* ***P.aeruginosa***	Ciprofloxacin ear drops Or Moxifloxacin ear drops Or		Require aural toileting and surgical management is definitive

Conditions	Likely causative organism	Emperic antibiotics (presumptive antibiotics)	Alternative antibiotics	Comments
		Neomycin+ hydrocortisone ear drops		
Mastoiditis				
Acute	*S.pneumoniae, S.aureus, H.infiuenzae, P.aeruginosa*	Cefotaxime 1-2 gm iv 4-8 hourly Ceftriaxone 2 gm iv OD		Modify as per culture Unusual causes- Nocardia, TB, Actinomyces.
Chronic	Polymicrobial	Piperacillin-tazobactam 4.5g IV 8h Meropenem 1 gm iv 8h		**Surgical management is definitive**
Acute bacterial sinusitis		1)Amoxicillin+clavulanate 40-60mg /kg/day or 2)cefuroxime axetil 30-50mg/kg/day		**Surgical management is definite**
Acute Pharyngitis/tonsillitis				
Exudative/Diffuse Erythema	Mostly viral Group A, C, G *Streptococcus,* Infectious mononucleosis,	Penicillin V oral x10 days or Benzathine Penicillin 1.2 MU IM x 1 dose or Cefdinir or cefpodoxime x 5 days		Penicillin allergic, Clindamycin 300-450 mg orally 6-8 hourly x 5 days. Azithromycin clarithromycin are alternatives.

Conditions	Likely causative organism	Emperic antibiotics (presumptive antibiotics)	Alternative antibiotics	Comments
Membranous pharyngitis	*C.diptheriae*,	Erythromycin 500 mg IV QID or Penicillin G 50,000 units/kg IV 12 hourly. Diptheria antitoxin: Horse serum.		
		<48 hrs:20,000-40,000 units, Nasopharyngeal membranes:40,000-60,000 units >3 days & bull neck : 80,000-1,20,000 units		
Epiglotitis(Supraglotis)	Children: *H.influenzae ,S.pyogenes, S.pneumoniae , S.aureus*	Amoxicillin+clavulanate 40-60mg /kg/day Or Cefotaxime 50 mg/kg IV 8 hourly or ceftriaxone 50 mg/kg IV 24 hourly	Levofloxacin 10 mg/kg IV 24 hourly + clindamycin 7.5 mg/kg IV 6 hourly.	**Watch for PO_2 and respiratory distress**

I. FEBRILE ILLNESS				
Conditions	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Scrub Typhus	*Orientia tsutsugamushi*	Doxycycline 100mg BD for 7 days		
Enteric Fever	*Salmonella Typhi,Salmonella paratyphi*	**Outpatients** Cefexime 20 mg/kg/day for 14 days OR Azithromycin 500mg BD for 7 days OR **Inpatients**Ceftriaxone 2 gmIV bd for 2 weeks +/- Azithromycin 500mg BD for 7 days		Avoid use of Fluoroquinolones

J. Eye infections				
Conditions	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Blepharitis	*S.aureus, S.epidermidis*	oral Cloxacillin 250 to 500 mg qid or oral Ceplhalexin 500mg qid	warm compress 24 hourly, artificial tears if associated with dry eye	
viral conjunctivitis		no antibiotic treatment required		
Bacterial conjuctivitis	*S.aureus, S.pneumoniae, H. influenzae*	Ophthalmologic solutions Gatifloxacin 0.3%, Levofloxacin 0.5%, Moxifloxacin 0.5% 1-2 drops q2h while awake during first 2 days then q4-8 hourly upto 7 days		
corneal infections				
Herpes simplex keratitis	Herpes simplex type 1 and 2	Trifluridine ophthalmic solution 1 drop 2 houly upto 9 times per day until reepithilised then 1 drop 4 hourly upto 5 times per day for 21 daystotal	gancyclovir 0.15% ophthalmic gel	
Varicella zoster ophthalmicus	Varicella zoster virus	Famcyclovir 500mg bd or valacyclovir 1 gram oral tid for 10 days	acyclovir 800mg 5 times per day for 10 days	
Acute bacterial keratitis	S. aureus, S. pneumoniae,S. pyogenes, Haemophilus spp.	Moxifloxacin 0.5% 1 drop 1 hourly for first 48 hours then reduce as per response	gatifloxacin 0.3%ophthalmic solution 1 drp 1 hourly for first 48 hours then reduce as per response	

K. Paediatric Infections				
Conditions	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
Urinary Tract Infection	*E.coli, Klebsiella,Proteus*			
Pyelonephritis		Amikacin 10-15mg/kg/dayIV OD or Ciprofloxacin 15-20mg/kg/day		Avoid use of Fluoroquinolones
Cystitis /uncomplicated UTI		Oral drugs Coamoxyclav40-50mg/kg/day BD Cotrimoxazole 8-10mg/kg/day PO		
Respiratory Tract Infection				
Community acquired Pneumonia	*Streptococcus pneumoniae ,Haemophilus influenzae*	Amoxycillin/Clavulanic acid for 5-10 days Injection Ampicillin + injection Gentamicin for 5-10 days		
Upper respiratory tract infections				
Bacterial Pharyngo tonsillitis	*Group A Streptococcus*	Oral Amoxycillin for 10 days orAzithromycin for 5 days		
Faucial diptheria	*Corynebacterium diptheriae*	Erythromycin for 14 days or Azithromycin for 5 days		
Acute Otitis media		Oral Amoxyclav for 7-10 days		
Acute sinusitis with URI		Oral Amoxyclav for 7-10 days		
Febrile illness				
Enteric fever	*Salmonella Typhi and S. Paratyphi A*	**Outpatient** Oral Cefixine20mg/kg/day for 14 days or Azithromycin10-15mg/kg/day for 7 days **Inpaptient** Inj Ceftriaxone		
Scrub Typhus	*Orientia tsutsugamushi*	Azithromycin or Doxycycline		
Early onset neonatal sepsis		Inj.Ampicillin+Gentamicin		
Late onset neonatal sepsis		Inj.Ampiclox+Amikacin		

L. Obstetric and gynaecological infections				
Conditions	**Likely causative Organism**	**Empiric antibiotics (Presumptive antibiotics)**	**Alternative antibiotics**	**Comments**
asymptomatic bacteriuria		Nitrofurantoin 100mg oral Bd for 7 days or Amoxycillin 500 mg oral bd for 7-10 days or Fosfomycin single dose	oral cephalosporins	screen in first trimester of pregnancy
Group B streptococcal diseases	*Group B Streptococci*	iv Penicillin G 5 million units (loading dose) then 2.5-3 million units iv qid until delivery or Ampicillin 2 gram iv (loading dose) then 1 gram qid until delivery	cefazolin 2 grams iv (loading dose) then 1 gram tid clindamycin 900 mg iv tid	associated with high risk of preterm labour, still birth, neonatal sepsis
chorioamnionitis	*Group B Streptococcus, gram negative bacilli, Chlamydiae, Ureaplasma and anaerobes*	Clindamycin, Vancomycin, Teicoplanin and cefoperazone sulbactam, if patient is not in sepsis then iv Ampicillin/Amoxyclav		
septic abortion		Amoxyclav or ampicillin 500mg qid + metronidazole 500 mg iv tds	Ceftriaxone 2grams iv od	
obstetric sepsis during pregnancy	*Group A beta haemolytic Streptococcus, E. coli, Anaerobes*	Amoxyclav or Ceftriaxone 2 gram iv od + metronidazole 500 mg iv tds +/- gentamycin 7mg per kg per day		
acute toxoplasmosis in pregnancy		<18 weeks of gestation at diagnosis spiramycin 1 gram oral qid until 16-18 weeks / pyrimethamine + sulfadiazine alternate every 2 weeks >18 weeks gestation: pyremethamine 50 mg oral bd for 2 days then 50 mg od + sulfadiazine 75 mg/kg oral x 1 dose then 50 mg per kg bd +folinic acid 10-20mg oral daily for minimum of 4 weeks		

Genital Tract Infections				
candidiasis	Candida species	fluconazole oral 150 mg single dose for milder cases intra vaginal agents as creams or suppositories clotrimazole, miconazole, nystatin single dose to 7-14 days		
bacterial vaginosis	polymicrobial	metronidazole 500mg oral bd for 7 days or tinidazole 2 grams oral od for 3 days		treat the partner
trichomoniasis	Trichomonas vaginalis	metronidazole 2 gram single dose or 500mg oral bd for 7 days or tinidazole 2 gram oral single dose		treat the partner
cervicitis, urethritis	polymicrobial	ceftrixone 250mg im single dose + azithromycin 1 gram single dose or doxyycline 100mg bd for 7 days		
pelvic inflammatory diseases (salphingitis and tuboovarian abscess)	S.aureus, Enterobacteriaceae, Gonococci, Gardenella	ceftrixone 250mg im/iv single dose + metronidazole 500mg bd for 14 days + doxycycline 100mg bd for 14 days		

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