ANTIBIOTIC POLICY FOR DISTRICT HOSPITAL MAMIT 2022

WHAT IS ANTIBIOTIC USAGE POLICY?

The antibiotic policy is essentially for prophylaxis, empirical and definitive therapy. The policy shall incorporate specific recommendations for the treatment of different high-risk/special groups such as immunocompromised hosts; hospital-associated infections and community-associated infections.

The hospital antibiotic policy shall be based upon:

- ✓Spectrum of antibiotic activity;
- ✓Pharmacokinetics/pharmacodynamics of these medicines
- ✓Adverse effects
- ✓Potential to select resistance
- ✓Cost
- ✓Special needs of individual patient groups.

(Source: Step-by-step approach for development and implementation of hospital antibiotic policy and standard treatment guidelines)

WHY ANTIBIOTIC USAGE POLICY IS NEEDED?

•Resistance is developing against antibiotics.So to minimise antibiotic resistance,there isneed to develop antibiotic usage policy.As per the requirement & depending on the level of facility, the antibiotic prescription should be generated resulting in decrease in antibiotic resistance in the state.

ANTIBIOTIC USAGE POLICY COMMITTEE

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PROPOSED LIST OF CATEGORIES OF ANTIMICROBIALS

S.No.	Restricted Antimicrobials	Semi-Restricted Antimicrobials	Unrestricted Antimicrobials
1	Pharmacy supply requires approval by Head of the hospital/unit/Antimicrobi alStewardship(AMS) team	Pharmacy supply of more than 3 days requires approval by Head ofthe hospital/unit/Antimicrobial Stewardship(AMS) team	Pharmacy supply doesn't require approval from Head of the hospital/unit/Antimicrobial Stewardship(AMS) team but requires prescription from a registered medical practitioner of Allopathicsystem of Medicine.
2	There should be clear indicationsas highlighted in National Treatment Guidelines for Antimicrobial Use in Infectious diseases(Version 1.0) 2016 + Laboratory evidence(Culture & sensitivity report)	There should be clear indications ashighlighted in National Treatment Guidelines for Antimicrobial Use in Infectious diseases(Version 1.0) 2016 + Laboratory evidence(Culture& sensitivity report)	Can be started empirically as per antibiotic policy/clinical indication but to be reviewed afteravailability of laboratory evidence Laboratory evidence(Culture & sensitivity report)
3	•Colistin •Meropenem •Imipenem •Ertapenem •Linezolid •Tigecycline •Daptomycin •Voriconazole •Valganciclovir •Newer preprations ofAmphotericin	•Vancomycin •Teicoplanin •3rd & 4th generation Cepalosporin •BL-BLI like Piperacillin-tazobactum,cefaperazon e-sulbactum •IV Ciprofloxin •Caspofungin •Amphotericin B	•Amoxicillin •Ampicillin •Cloxacillin •BL-BLI like Ampisulbactum,Amoxyclavulanic acid •1st & 2nd generation Cephalosporins •Cotrimoxazole •Azithromycin •Clarithromycin •Fluoroquinolones •Metronidazole •Clindamycin •Fluconazole

I. Upper Respiratory Tract Infections

Condition	Most likely organisms	Drug	Dose	Duration
Acute bacterial rhinosinusitis	Streptococcus pneumoniae H. influenzae M. catarrhalis	Amoxycillin- Clavulanate	875/125 mg, O, q 12 hours	7 days
		In case of Penicillin allergy: Azithromycin	500 mg, O, q 24 hours	3 days
Acute pharyngitis	Streptococcus pyogenes Viruses [Antibiotic administration only for patients who are most likely to have S. pyogenes infection: fever, tonsillar exudates, no cough, & tender anterior cervical lymphadenopathy]	Penicilin V OR Amoxycillin	500mg O q 12 hours 500 mg, O, q 8 hours	10 days 10 days
		In case of Penicillin allergy: Azithromycin	500 mg, O, OD	5 days
Acute epiglottitis [Airway management essential]	<u>Children:</u> H influenzae Streptococcus pyogenes Streptococcus pneumoniae S. aureus <u>Adult:</u> H influenzae Streptococcus pyogenes	Ceftriaxone OR Cefotaxime OR Levofloxacin + Clindamycin	50 mg/kg IV 24 hourly OR 50 mg/kg IV 8 hourly OR 10 mg/kg IV 24 hourly + 7.5 mg/kg IV 6 hourly	
Malignant otitis externa (usually diabetic or immunocompromised)Debridement usually required. Osteomyelitisto be ruled out.	Pseudomonas aeruginosa in > 90% cases	For early disease : Ciprofloxacin	750 mg, PO, q 12 hours	Up to 5 days after signs of inflammation resolve. 6 weeks in case of bone involvement.
		For advanced disease : Ceftazidime OR Piperacillin-Tazobactum	2 g, IV, q 8 hours OR 4.5 gm IV 6 hourly	
Acute Otitis Media Treat children <2 years.If >2 years, afebrile & no ear pain: consider analgesics & defer antibiotics	Streptococcus pneumoniae H. influenzae M. catarrhalis	Amoxycillin- Clavulanate	90/6.4 mg/kg/day, O, q 12 hours	If age <2 years: 10 days If age >2 years : 5-7 days
		If treated in past 1 mon: Cefuroxime- Axetil	250 mg, O, q 12 hours	

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

II. Lower Respiratory Tract Infections

Condition	Most likely organisms	Drug	Dose	Duration
Acute exacerbation of chronic bronchitis	S. pneumoniae H. influenzae M. catarrhalis Viruses Chlamydophil a pneumoniae	<u>OPD patient:</u> Amoxicillin/Azithromycin	 500-1000 mg thrice a day/ 500 mg once a day	 5-7 days/ 3 days
		<u>Indoor patient:</u> Amoxicillin/clavulanic acid/ Cefuroxime/ Cefixime	 625 mg thrice a day/ 500 mg BD/200 mg BD	 5-7 days
Bronchiectasis, acute exacerbation	H. influenzae, P. aeruginosa	Amoxicillin/clavulanic acid Long term (in case of repeated exacerbation): Azithromycin	625 mg thrice a day 500 mg thrice a week	5-7 days 1-2 months
Community-acquired pneumonia (CAP)[non-hospitalized patient]	<u>No comorbidity</u> M. pneumoniae, S. pneumoniae Viruses	Azithromycin OR Amoxicillin	500 mg OD OR 500-1000 mg thrice a day	3 days 5 days
Community-acquired pneumonia (CAP) [Hospitalized(Non ICU) patient or with comorbidities]	M. pneumoniae, S. pneumoniae Viruses	Amoxi-clav/Cefotaxime/Ceftriaxone PLUS Azithromycin	1.2 gm IV TDS/ 2-4 gm /day IV/ 2 gm IV OD PLUS 500 mg IV OD	5-8 days/ 7-10 days/ 5-8 days 7-10 days
CAP in ICU- (No risk factor for pseudomonas)	S. pneumoniae, H. influenzae, M. catarrhalis, Legionella spp.	Amoxi-clav/Cefotaxime/Ceftriaxone PLUS Azithromycin	1.2 gm IV TDS/ 2-4 gm /day IV/ 2 gm IV OD PLUS 500 mg IV OD	5-8 days/ 7-10 days/ 5-8 days 7-10 days
CAP in ICU (risk factor for pseudomonas)	P. aeruginosa	Ceftazidime/Cefoperazone/Piperacillin-Tazobactam/Imipenem /Meropenem ± Gentamicin/	2 gm IV TDS/ 1-2 gm IV QID/ 4.5 gm IV QID/ 0.5-1gm IV QID 1-2 gm IV TDS upto 1.6 gm IV per day	10-14 days

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2. The duration shown denotes the length of treatment in case the empirical antibiotic is continued.

Condition	Most likely organisms	Drug	Dose	Duration
MDR Acinetobacter Presence of risk factors formulti-drug resistant bacteria like: i. Antimicrobial therapyin preceding three months ii. Present hospitalizationof ≥5 days iii. High frequency of antibiotic resistance inthe community or in the specific hospital unit. iv. Hospitalization for ≥48 hours in preceding three months v. Home infusion therapy including antibiotics vi. Home wound care. vii. Chronic dialysis withinone month viii. Family member withMDR pathogen ix. Immunosuppressive drug and/or therapy	Any of the following drugs according to sensitivity (For 14 days) Carbapenem (imipenam/ meropenam), Colistin, Sulbactam plus carbapenem, Sulbactam plus Colistin, Polymyxin.Sulbactam should be stopped after 5 days in patients responding to treatment.			

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Condition	Most likely organisms	Drug	Dose	Duration
MDR Pseudomonas Risk factor: Immunocompromised state, Chronic respiratory conditions like COPD, Asthma, Bronchiectasis; Enteral tube feeding, Cerebrovascular accident, Chronic neurological conditions.	Carbapenam (imipenem/ meropenam) AND Amynoglycoside/Fluoroquinolone (For 14 days) (Ciprofloxacin – Only if TB is ruled out)			
Methicillin Resistance Staph Aureus MRSA is rare in Indian ICU; So if MRSA is strongly suspected in late onset VAP/HAP in ICU having document ed MRSA, only then Start MRSA empirictreatment.	Empiric Vancomycin OR Teicoplanin (For 14 Days) Linezolid should be reserved due to potential Antitubercular effect and should be preferred only if pt is vancomycin intolerant or has concomitant renal failure or vancomycin resistant organism.			
Aspiration pneumonia ± lung abscess	Anaerobes 34%, Gram-positive cocci 26%, Strep. milleri 16%, Klebsiella pneumoniae 25%, Nocardia 3%	Ceftriaxone plus Metronidazole or clindamycin	1 gm, IV, q 24 h plus 500 mg, IV, q 8 h or 1 gm, IV, q 12 h	For aspiration pneumonia- 5 to 7 days Lung abscess-4 - 6 weeks

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III. CNS Infections:

Condition	Situation/Severity	Most likely organisms	Drug	Dose	Duration
Meningitis	Immunocompetent,	S pneumoniae N meningitidis H influenzae	Ceftriaxone OR Cefotaxime	2g IV q12 h OR 2g IV q4-6h	10-14 days 10-14 days
			Chloramphenicol (in case of Penicillin Allergy)		
	Immunocompromised	S pneumoniae N meningitidis H influenza GNR	Vancomycin AND Meropenem	1.5g IV Loading AND 1g IV q12h 2g IV q8h	 10-14 days 10-14 days
	Post neurosurgery Penetrating head trauma	Staphylococcus epidermidis, Staphylococcus aureus, Propionibacterium acnes, Pseudomonas aeruginosa, Acinetobacter baumanii	Vancomycin AND Meropenem	1.5g IV Loading AND 1g IV q12h 2g IV q8h	 10-14 days 10-14 days
	Infected shunt	S aureus GNR (rare)	Vancomycin AND Meropenem	1g IV q12h AND 2g IV q8h	10-14 days
	Meningitis with basilar skull fractures Dexamethasone 0.15mg/kg IV q6h for 2-4 days (1st dose with or before first antibiotic dose)	S pneumonia H. Influenzae	Ceftriaxone	2g IV q12h	14 days

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2. The duration shown denotes the length of treatment in case the empirical antibiotic is continued.

Condition	Situation/Severity	Most likely organisms	Drug	Dose	Duration
	Organism specific therapy	S pneumoniae N meningitidis H influenzae E coli S. aureus-MSSA S. aureus-MRSA Enterococcus Candida species Cryptococcus	Ceftriaxone Ceftriaxon e Ceftriaxon e Ceftriaxone Oxacillin Vancomycin Ampicillin AND Gentamicin Amphotericin B Amphotericin B AND Flucytocine	2g IV q12h 2g IV q12h 2g IV q12h 2g IV q12h 2g IV q4h 1g IV q12h 2g IV q4h AND 5mg/kg IV q24h 1mg/kg IV q24h 1mg/kg IV q24h AND 25mg/kg PO q6h	10-14 days 7 days 7 days 21 days 10-14 days 10-14 days
Encephalitis		HSV/VZV	Acyclovir	10mg/kg IVI q8h	14-21 days
Brain abscess Exclude TB, Nocardia, Aspergillus, Mucor	Source unknown	Streptococci, Bacteroides, Enterobacteriaceae, S. aureus	Vancomycin AND Ceftriaxone AND Metronidazole	1g IV q12h AND 2g IV q12h AND 500mg IV q6h	Duration guided by response
	Source : Sinusitis	S pneumoniae Anaerobes	Ceftriaxone AND Metronidazole	2g IV q12h AND 500mg IVq6h	

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2. The duration shown denotes the length of treatment in case the empirical antibiotic is continued.

Condition	Situation/Severity	Most likely organisms	Drug	Dose	Duration
If abscess<2.5cm & patient neurologically stable, await response to antibiotics, Otherwise, consider aspiration/surgical drainageand modify antibiotics as per sensitivity of aspirated/ drained secretions.	Source : Chronic otitis	S pneumonia Anaerobes	Ceftriaxone AND Metronidazole	2g IV q12h AND 500mg IV q6h	
	Source : Post neurosurgery	S aureus GNR	Vancomycin AND Meropenem	1g IV q12h AND 2g IV q8h	
	Source : Cyanotic heart disease	Streptococci	Ceftriaxone	2g IV q12h	

Note:

1. Antibiotic therapy must be started within 30 minutes of suspecting a CNS infection.
2. Please give Dexamethasome to all patients with suspected meningitis in the dose of 0.15 mg/kg IV Q6H for 2-4 days, ideally first dose 10-20 minutes before an antibiotic.
3. STOP Antibiotic treatment if LP culture obtained prior to antibiotic therapy is negative at 48 hours OR no PMNs on CSF cell count.

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IV. Skin and Soft tissue infections

Condition	Situation/ Severity	Most likely organisms	Drug	Dose	Duration
Cellulitis See note 1 below	Non-suppurative	Streptococci	Amoxy/Clavulinic acid OR Amoxy/Clavulinic acid OR Ceftriaxone OR Clindamycin	625mg PO q8h OR 1.2g IV q8h OR 2gm IV q24h OR 600-900mg IV q8h	5-7 days
	Suppurative cellulitis or cutaneous abscess	S aureus			
	Cat/dog bite	P multocida	Amoxy/Clavulinic acid	625mg PO q8h	5-7 days
Diabetic foot See notes 2,3,4,5,6 as below	Mild infection	S aureus	Amoxy/Clavulinic acid OR Cephalexin OR Clindamycin	875mg PO q12h OR 500mg PO q6h OR 300mg PO q8h	7-10 days
	Moderate infection	S aureus Streptococci Psuedomonas Enterobacteriacae	Ertapenem OR Ciprofloxacin AND Metronidazole OR Clindamycin	1gm IV q24h OR 500mg PO q12h AND 400mg PO q8h OR 300mg PO q8h	7-10 days
	Severe infection	S aureus Streptococci Psuedomonas Enterobacteriacae Anaerobes	Piperacillin/Tazobactum OR Ciprofloxacin OR Aztreonam AND Clindamycin	4.5g IV q6h OR 500mg IVq12h OR 1gm IV q8h AND 600mg IV q8h	7-10days
			Piperacillin/Tazobactum AND Vancomycin	4.5g IV q6h AND 1gm q12h	7-10days

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

Condition	Situation/ Severity	Most likely organisms	Drug	Dose	Duration
Necrotizing fasciitis See note 7 as below		S aureus Clostridia Anaerobes Streptococci	Piperacillin/Tazobactum AND Clindamycin	4.5g IV q6h AND 600-900mg IV q8h	Duration depends on the progress
				OR	
			Imipenem/Meropenem AND Clindamycin/ Linezolid	1gm IV q8h/1gm IV q8h AND 600-900mg IV q8h/ 600mg IV BD	

Note:

1. Incision and drainage is preferred therapy in case of cutaneous abscess. Antibiotics are indicated if infection is severe, assc extensive cellulitis, septic phlebitis, diabetes, advanced age, or no response to I & D.
2. Uninfected diabetic foot has no purulence or inflamamtaion (erythema, pain, tenderness, warmth, induration).
3. Mild diabetic foot infection : Presence of purulence and one sign of inflammation.
4. Moderate diabetic foot infection : Mild inflammation and >2 cm of cellulitis, lymphangitic streaking, deep tissue abscess, ga ngrene, involvement ofmuscle, tendon, joint, or bone.
5. Ulcer floor should be probed carefully. If bone can be touched with a metal probe then the patient should be treated for osteomyelitis withantibiotics in addition to surgical debridement.
6. Duration of treatment depends on response. Usually 7-10 days after surgical debridement. Treatment is prolonged with osteomyelitis.
7. In necrotizing fasciitis, antibiotics are only an adjunct to surgical debridement.

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V. Genitourinary infections

Condition	Most likely organisms	Drug	Dose	Duration
Pelvic Inflammatory Disease (PID), salpingitis, tubo-ovarian abscess Outpatient t/t: Pts with temp <38°C, WBC <11,000 per mm^3, minimal evidence of peritonitis, active bowel sounds & able to tolerate oral nourishment Initial inpatient evaluation/therapy suggested for pts with tubo-ovarian abscess. Drainage of tubo-ovarian abscess wherever .indicated. Evaluate and treat sex partner.	N. gonorrhoeae, Chlamydia, Bacteroides, Enterobacteriaceae, Streptococci Gardenella vaginalis S. aureus .	**Outpatient regimen:** C**eftriaxone** ± M**etro** + D**oxy** OR **Cefoxitin +** **Probenecid** + D**oxy** + M**etro** **Inpatient regimen:** **Ceftriaxone** + **Clindamycin** **then** **switch to outpatient regimen**	250 mg IM or IV ±400 mg po bid + 100 mg po bid OR 2 gm IM +1 gm po + 100 mg po bid +400 mg po bid 250 mg IM stat +900 mg IV q8h ±	Single dose 14 days 14 days Single dose Single dose 14 days 14 days For inpatient regimens, continue treatment until satisfactory response for ≥ 24-hr beforeswitching to outpatient regimen.

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Condition	Most likely organisms	Drug	Dose	Duration
Vaginitis **Candidiasis** Pruritus, thick cheesy discharge, pH <4.5	Candida albicans 80–90%. C. glabrata, C. tropicalis may be increasing—they are less susceptible to azoles	**Oral azoles:** **Fluconazole** **Intravaginal azoles:** **Clotrimazole** OR **Miconazole**	150 mg po 200 mg vaginal tabs at bedtime OR 1% cream (5 gm) at bedtime OR 100 mg vaginal tab OR 500 mg vaginal tab 200 mg vaginal suppos. at bedtime OR 100 mg vaginal suppos. q24h OR 2% cream (5 gm) at bedtime	Single dose 3 days 7-14 days 7 days Singl e dose 3 days 7 days 7 days
Recurrent candidiasis (4 or more episodes/ yr)		**Fluconazole** **Clotrimazole**	150 mg po q week Vag. suppositories 500 mg q week	6 months 6 months
Balanitis Occurs in 1/4 of male sex partners of women infected with candida.	Candida 40%, Group B Strep, gardnerella	Oral or topical **azoles** as for vaginitis		

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Condition	Most likely organisms	Drug	Dose	Duration
Bacterial vaginosis Malodorous vaginal discharge, pH >4.5 • Reported 50% ↑ in cure rate if abstain from sex or use condoms • Treatment of male sex partner **not** indicated unless balanitis present.	Etiology unclear: Gardnerella vaginalis, Mobiluncus, Mycoplasma hominis, Prevotella sp., Atopobium vaginae etc.	**Metronidazole** OR **Tinidazole** OR **Clindamycin**	**Metro** 400 mg po bid OR **Metro vaginal gel** 1 applicator intravaginally at bedtime 2 gm po once daily OR 1 gm po once daily 300 mg po bid OR 2% vaginal cream 5 gm at bedtime	7 days 5 days 2 days 5 days 7 days 7 days
Vaginal Trichomoniasis Copious foamy discharge, pH >4.5 Treat male sexual partners: Metronidazole 2 gm as single dose	Trichomonas vaginalis	**Metronidazole** OR **Tinidazole**	2 gm po single dose OR 400 mg po bid 2 gm po single dose **For treatment failure: Metro** 400 mg po bid **2nd failure: Metro** 2 gm po q24h	7 d a y s 7

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				d a y s 3-5 days
Urethritis, cervicitis, proctitis (uncomplicated)	N. gonorrhoeae (50% of pts with urethritis, cervicitis have concomitant C. trachomatis). Empirical t/t to cover both pathogens	**Ceftriaxone +** **Azithro** OR **Doxy**	250 mg IM + 1 gm po OR 100 mg po q12h	Single dose Singl e dose 7 days

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Condition	Most likely organisms	Drug	Dose	Duration
Epididymo-orchitis Age <35 years	N. gonorrhoeae, Chlamydia trachomatis	**Ceftriaxone +** **Azithro** OR **Doxy**	250 mg IM + 1 gm po OR 100 mg po bid	Single dose Single dose
Age >35 years or homosexual men (insertive partners in anal intercourse)	Enterobacteriaceae (coliforms)	**Levofloxacin** OR **Ciprofloxacin**	500-750 mg IV/po once daily OR 500 mg po or 400 mg IV twice daily	10 days 10-14 days
Acute Prostatitis ≤35 years of age	N. gonorrhoeae, C. trachomatis	**Ceftriaxone** + **Azithro** OR **Doxy**	250 mg IM + 1 gm po OR 100 mg po bid	Single dose Single dose
≥35 years of age Note: Urine and prostatic massage culture samples to be taken prior to antibiotics. De-escalate after the availability of culture sensitivity reports.	Enterobacteriaceae (coliforms)	**Levofloxacin** OR **Ciprofloxacin** OR **TMP-SMX**	500-750 mg IV/po once daily OR 500 mg po or 400 mg IV twice daily x OR 1 ds tablet po BID	10 days 10-14 days
Acute, uncomplicated cystitis/ urethritis in women	E. coli, other members of Enterobacteriaceae, Staphylococcus saprophyticus, Enterococci	**Nitrofurantoin** OR **Ciprofloxacin**	100 mg, PO, BD OR 250 mg, PO, q12hrs	7 days 5 days

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Condition	Most likely organisms	Drug	Dose	Duration
Young woman with typical symptoms, pyuria present, culture-negative	Chlamydia trachomatis	**Azithromycin** OR **Doxycycline**	1g, PO OR 100 mg, PO, q 12 hrs	single dose 7 days
Acute uncomplicated pyelonephritis Note: Urine culture samples to be taken prior to initiation of antibiotic therapy and used to guide antibiotic regiment once the report is available. Monitor renal function	E. coli, other members of Enterobacteriaceae , Enterococci	**Amikacin** OR **Gentamicin**	1gm OD IM/IV OR 7 mg/kg/day OD IM/IV	14 days
Complicated pyelonephritis Note: Urine culture samples to be taken prior to antibiotics. De-escalate after the availability of culture sensitivity reports. Monitor renal function if aminoglycoside is used.	Escherichia coli, Klebsiella pneumonia, Proteus mirabilis, Pseudomonas aeruginosa, Enterococcus Sp. Frequently multi-drug resistant organisms are present	**Piperacillin-tazobactam** OR **Imipenem** OR **Meropenem** OR **Amikacin**	4.5 g, IV, q 8 hrs OR 1 g, IV, q 8 hrs OR 1 gm IV q 8 h OR 1gm OD IM/IV	10-14 days
Acute pyelonephritis, hospitalized, either sex	E. coli, other members of Enterobacteriaceae , Enterococci	**Piperacillin-tazobactam** OR **Imipenem**	4.5 g, IV, q 8 hrs OR 1 g, IV, q 12 hrs	14 days 14 days
UTI in hospitalized patient on long-term urinary catheter	Enterobacteriaceae, Pseudomonas aeruginosa, Acinetobacter spp., Enterococci	Wait for C/S result. If patient is in sepsis, start **Colistin** + **Vancomycin**, until C/S results are available	2 million IU, IV, q 12 hrs 1 g, IV, q 12 hrs	

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Condition	Most likely organisms	Drug	Dose	Duration
Chorioamnionitis	Group B Streptococcus, Gram negative bacilli, chlamydiae, ureaplasma and anaerobes, usually Polymicrobial	Clindamycin/ Vancomycin Teicoplanin + Cefoperazone-sulbactum If patient is not in sepsis then IV Ampicillin		
Septic abortion **Endomyometritis and Septic Pelvic Vein Phlebitis**	Bacteroides, Prevotella bivius, Group B, Group A Streptococcus, Enterobactereaceae, C. trachomatis, Clostridium perfringens.	If patient has not taken any prior antibiotic (start antibiotic after sending cultures) Ampicillin + Metronidazole It patients has been partially treated with antibiotics, send blood cultures and start Piperacillin-Tazobactam OR Cefoperazone-sulbactum till the sensitivity report is available.	**500 mg QID + 500mg IV TDS**	
Obstetric Sepsis during pregnancy	Group A beta-haemolytic Streptococcus, E. coli, anaerobes.	It patient is in shock and blood culture reports are pending, then start		

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Condition	Most likely organisms	Drug	Dose	Duration
		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 OR Ceftriaxone + Metronidazole ± Gentamicin If admission needed. MRSA cover may be required if suspected or colonized (Vancomycin/ Teicoplanin)	**625 mg TDS po/ 1.2gm TDS IV** **OR** **2gm IV OD** **500mg IV TDS** **7mg/kg/day OD**	
Obstetric Sepsis following pregnancy Source of sepsis outside Genital tract Mastitis UTI Pneumonia Skin and soft tissue (IV site, surgical site, drain site etc.)	S. pyogenes, E. coli, S. aureus S. pneumoniae Meticillin-resistant S. aureus (MRSA), C. septicum & Morganella morganii.	Same as above		

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2. The duration shown denotes the length of treatment in case the empirical antibiotic is continued.

VI. Infective Endocarditis

Condition	Most likely organisms	Drug	Dose	Duration
Infective Endocarditis: Native valve (awaiting cultures) Indolent	Viridans Streptococci, other Streptococci Enterococci	Penicillin G OR Ampicillin Plus Gentamicin	20MU IV divided doses 4h OR 2gm iv 4h Plus 1mg/kg im or iv 8h	4-6 weeks
Infective Endocarditis: Navtive valve (awaiting cultures) In Severe Sepsis	S.aureus (MSSA or MRSA) Risk for gram-negative bacilli	Vancomycin Plus Meropenem	25-30mg/kg loading followed by 15-20 mg/kg IV 12 hourly (maximum 1gm 12) hourly) Plus 1gm IV 8h	4-6 weeks
Endocarditis (< 2 months); Prosthetic Valve	Staph Gram Negative Rods Diptheroids	Vancomycin Plus Meropenem / Imipenem	25-30mg/kg loading followed by 15-20 mg/kg IV 12 hourly (maximum 1gm 12) hourly) Plus 1gm IV 8h / 500mg IV q6h	
Endocarditis (> 2 months); Prosthetic Valve	CONS Enterococcus S.aureus	Vancomycin Plus Gentamicin	25-30mg/kg loading followed by 15-20 mg/kg IV 12 hourly (maximum 1gm 12) hourly) Plus 1 mg/kg body weight iv 8 hourly, modified according to renal function	

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

VII. Gastrointestinal & Intra-Abdominal Infections

Condition	Most likely organisms	Drug	Dose	Duration
Acute Gastroenteritis	Viral, Entero-toxigenic & Entero-pathogenic E. Coli	None	None	None
Food poisoning	S. aureus, B. cereus, C. botulinum			
Cholera	V. cholerae	Doxycycline OR Azithromycin OR Ciprofloxacin	300mg Oral 1gm Oral 500mg BD	Stat 3 days
Bacterial dysentery	Shigella sp., Campylobacter, Non-typhoidal Salmonellosis	Ceftriaxone OR Cefixime OR Azithromycin (drug of choice for Campylobacter)	2gm IV OD 10-15mg/kg/day 1g OD	5 days 3 days
Amoebic dysentery	E. histolytica	Metronidazole OR Tinidazole	400mg Oral TDS 2gm Oral OD	7-10 days 3 days
Giardiasis	Giardia lamblia	Metronidazole OR Tinidazole	250-500mg Oral TDS 2gm Oral	7-10 days 1 dose
Hospital acquired diarrhea	C. difficile	Metronidazole OR Vancomycin	400mg Oral TDS 250mg Oral QDS	10 days
Enteric fever (Outpatients)	S. Typhi, S. Paratyphi A	Cefixime OR Azithromycin OR Cotrimoxazole OR	20mg/kg/day 500mg BD 960mg BD	14 days 7 days 2 weeks

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

Condition	Most likely organisms	Drug	Dose	Duration
Enteric fever (Inpatients)	S. Thyphi, S. Paratyphi A	Ceftriaxone (Ceftriaxone to be changed to oral cefixime when patient is afebrile to finish total duration of 14 days) OR Azithromycin	2 g IV BD 500mg BD	2 weeks 7 days
Biliary tract infections (cholangitis, cholecystitis)	Enterobacteriaceae (E.coli, Klebsiella sp.)	Ceftriaxone OR Piperacillin-Tazobactam	2 g IV OD 4.5gm IV 8 hourly	7-10 days
Biliary tract infections (cholangitis, cholecystitis) (For serious patients and documented ESBL producers)	Enterobacteriaceae (E.coli, Klebsiella sp.)	Imipenem OR Meropenem	500mg IV 6hourly 1gm IV 8hourly	7-10 days
Spontaneous Bacterial Peritonitis	Enterobacteriaceae (E.coli, Klebsiella sp.)	Cefotaxime OR Piperacillin-Tazobactam	1-2 g IV TDS 4.5gm IV 8 hourly	Duration of treatment is based on source control and clinical improvement
Spontaneous Bacterial Peritonitis (For serious patients and documented ESBL producers)	Enterobacteriaceae (E.coli, Klebsiella sp.)	Imipenem OR Meropenem	500mg IV 6hourly OR 1gm IV 8hourly	
Secondary Peritonitis, Intra-abdominal abscess/ GI perforation	Enterobacteriaceae (E.coli, Klebsiella sp.), Bacteroides (colonic perforation), Anaerobes	Piperacillin-Tazobactam OR Imipenem OR Meropenem	4.5gm IV 8 hourly OR 500mg IV 6 hourly OR 1gm IV 8hourly	Duration of treatment is based on source control and clinical improvement
		In very sickpatients, if required, addition of cover for yeast (fluconazole iv 800 mg loading dose day 1, followed by 400 mg 2nd day onwards) & and for Enterococcus (vancomycin /teicoplanin) may be contemplated		

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

Condition	Most likely organisms	Drug	Dose	Duration
Pancreatitis Mild- moderate		No antibiotics		
Post necrotizing pancreatitis: infected pseudocyst; pancreatic abscess	Entrobacteriaceae, Enterococci, S. aureus, S. epidermidis, anaerobes, Candida sp.	Piperacillin-Tazobactam OR Imipenem OR Meropenem	4.5gm IV 8 hourly OR 500mg IV 6 hourly OR 1gm IV 8hourly	Duration of treatment is based on source control and clinical improvement
		In very sick patients, if required, addition of cover for yeast (fluconazole iv 800 mg loading dose day 1, followed by 400 mg 2nd day onwards) & and for Enterococcus (vancomycin /teicoplanin) may be contemplated		
Diverticulitis- Mild (OPD treatment)	Gram negative rods, Anaerobes	Amoxycillin-Clavulanate	625 mg TDS	7 days
Diverticulitis- Moderate	Gram negative rods, Anaerobes	Ceftriaxone + Metronidazole OR Piperacillin-Tazobactam	2 g IV OD + 500 mg IV TDS OR 4.5gm IV 8 hourly	Duration of treatment is based on source control and clinical improvement
Diverticulitis- Severe	Gram negative rods, Anaerobes	Imipenem OR Meropenem	500mg IV 6hourly 1gm IV 8hourly	Duration of treatment is based on source control and clinical improvement
Liver Abscess	Polymicrobial	Ceftriaxone + Metronidazole OR Piperacillin-Tazobactam	2 g IV OD + 500 mg IV TDS/ 800 mg Orally TDS OR 4.5gm IV 8 hourly	2 weeks. USG-guided drainage indicated in large abscesses, signs of imminent rupture and tono response to medical treatment.

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

VIII. Sepsis: The choice of antibiotics depends on the source

1. **Lungs** : follow pneumonia guidelines
2. **SSTI**:
   a) **Extensive inflammation+ SystemicToxicity**: GNB, S.aureus: BL+BLI (Piptaz-4.5 gm iv Q8H) or Carbapenem (Meropenem1 gm iv Q8H/ Imipenem 500 mg iv Q6H) +Vancomycin (1gm iv BD)
   b) **Necrotizing fasciitis:**Streptococci,Anaerobes, GNB, Staph aureus: BL + BLI (Piptaz-4.5 gm iv Q8H) or Carbapenem(Meropenem 1 gm iv Q8H/ Imipenem 500 mg iv Q6H) +Clindamycin (600 mg iv Q8H).
3. **Secondary peritonitis**: Enterobacteriacea, Bacteroides, Enterococci, Pseudo: BL/ BLI(Piptaz-4.5 gm iv Q8H)
4. **Primary peritonitis** :S pneumoniae, GNB: Ceftriaxone/Cefotaxime (Ceftriaxone 1 gm iv BD)
5. **Uncomplicatedpyelonephritis**:GNB: BL +BLI(Piptaz-4.5 gm iv Q8H)
6. **Pyelonephritis** :GNB (E coli,Pseudomonas):Carbapenem(Meropenem 1 gm iv Q8H/ Imipenem 500 mg iv Q6H)
7. **Severe Pyelonephritis, Perinephric abscess, Emphysematous pyelonephritis**:GNB :Carbapenem(Meropenem 1 gm iv Q8H/Imipenem 500 mg iv Q6H)
8. **Unknown origin**: Carbapenem(Meropenem 1 gm iv Q8H/ Imipenem 500 mg iv Q6H) + Vancomycin/Teicoplanin(Vancomycin1 gm iv BD/ Teicoplanin 400 mg iv BD for one day, thereafter 400 mg iv OD for 2 days thereafter as per Cr Cl)

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

IX. Pediatric Infections

IX. A. Pediatric Respiratory Tract Infections

Condition	Most likely organisms	Drug	Dose	Duration
Pharyngotonsillitis	Most are caused due to Viruses 30% bacterial -Group A hemolytic streptococci Group C Streptococcus Arcanobacterium haemolyticum	Viral – no antibiotics needed If bacterial: Inflamed enlarged tonsils with pus points Amoxicillin Penicillin Benzathine Penicillin If penicillin allergic children: Erythromycin Azithromycin	- 50-75 mg/kg/day PO BD/TID 50-75 mg/kg/day PO BD/TID <27kg: 6,00,000 units IM >27KG: 1.2 million units IM 20-40 mg/kg/day PO BID/QID 12 mg/kg/day	- 10 days 10 days Single dose 10 days 5 days
Diphtheria	Corynebacterium diptheriae	Erythromycin Azithromycin	20-40 mg/kg/day PO BID/QID 12 mg/kg/day	10 days 5 days
Acute Otitis Media	S. pneumoniae, H. influenzae, M. catarrhalis	Amoxycillin Coamoxycla v Cefuroxime I.V. Ceftriaxone	40-50 mg/kg/day 40-50 mg/kg/day BD 20-30 mg/kg/day BD 75 mg/kg/day BD	7-10 days 7-10 days 7-10 days 7-10 days
Acute Sinusitis	S. pneumoniae, H. influenzae, M. catarrhalis	Amoxycillin Coamoxycla v Cefuroxime I.V. Ceftriaxone	40-50 mg/kg/day 40-50 mg/kg/day BD 20-30 mg/kg/day BD 75 mg/kg/day BD	7-10 days 7-10 days 7-10 days 3-5 days

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

Condition	Most likely organisms	Drug	Dose	Duration
Ludwig's Angina	S. pyogenes Staph. aureus	Penicilllin G plus Clindamycin	200000-250000 U/kg/day, q 6 hours 40 mg/kg/day q 8 hours	
Pertussis	Bordetella pertussis	Azithromycin Clarithr omycin Erythromycin	10 mg/kg/day OD 15 mg/kg/day BD 40 mg/kg/day QID	5 days 7 days 14 days
Acute laryngotracheobronchitis	Parainfluenza virus	Antibiotics not needed	-	-
Acute Epiglottitis	H. influenzae S. pneumoniae	I.V. Ceftriaxone	50 mg/kg/day OD	7-10 days
Bronchiolitis	Respiratory syncytial virus, Metapneumovirus	Antibiotics not needed	-	-
Pneumonia				
Community Acquired Pneumonia	3 mnth- 4 yrs: S.pneumonia e S.aureus S.pyogenes ≥ 5 yrs: Chlamydophila pneumoniae, Mycoplasma			
Mild-moderate:	Bronchopneumonia (mostly viral) lobar pneumonia	no antibiotic required Amoxycillin	 80-90 mg/kg/day QID	 7-10 days

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

Condition	Most likely organisms	Drug	Dose	Duration
Moderate-severe		Ampicillin Ceftri axone Cefotaxim	200 mg/kg/day QID 50-75mg/kg/day OD150 mg/kg/day	7-14 days 10-14 days 10-14 days
	MRSA	Vancomycin	60 mg/kg/day	10-14 days
	Mycoplasma	Azithromycin	10 mg/kg/day OD	5 days
Nosocomial pneumonia	Staph. aureus P. aeruginosa S. pneumoniae H. influenzae	Meropenem	60 mg/kg/day TDS	10-14 days
		Piperacillin-tazobactum	240-300 mg/kg/day TDS	10-14 days
		Cefipime	150 mg/kg/day TDS	10-14 days
		PLUS Gentamicin	6 - 7.5 mg/kg/day	10-14 days
	MRSA	Add Vancomycin	60mg/kg/day	10-14 days
With Pleural effusion/empyema	Staph aureus Klebsiella S. pneumoniae	Ceftraixone	50-75 mg/kg/day	2-3 week
		Cefotaxime	150 mg/kg/day	2-3 week
		Vancomycin	60 mg/kg/day	2-3 week

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

IX. B. Pediatric CNS Infections

Condition	Most likely organisms	Drug	Dose	Duration
Meningitis	H. Influenzae N. meningitidis S. pneumoniae	Cefotaxim Ceftraixone Vancomyci n	200-300 mg/kg/day QID 100 mg/kg/day BD 60 mg/kg/day	14-21 days 14-21 days 14-21 days
Community Acquired	GBS, E.Coli, L.monocytogenes, S.pneumoniae	I.V. Cefotaxim PLUS Gentamycin	150-200mg/kg/day TID 5-8mg/kg/day OD	21 days for gram negative , 14-21 days for GBS and other gram positive bacilli
Hospital Acquired (low probability ofresistant strains)	Staphylococcus, CONS, Gram negative bacilli,	I.V. Cefotaxim PLUS I.V. Amikacin	150-200 mg/kg/day TID 15-20 mg/kg/day OD/BD	
Hospital Acquired (High Probability of resistant strains)	Gram negative bacilli,	I.V. Cefotaxim OR I.V.Meropene m PLUS I.V. Amikacin	150-200 mg/kg/day TID 120 mg/kg/day TID 15-20 mg/kg/day BD/OD	
	Pseudomonas	I.V. Ceftazidime	100-150 mg/kg/day BD/TID	—
	Staphylococcu s (MRSA)	I.V. Vancomycin I.V. clindamycin I.V. linezolid	40-60 mg/kg/day TID/QID 20-30 mg/kg/day TID/QID 30 mg/kg/day TID	—

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

IX. C. Pediatric Gastrointestinal Infections

Condition	Most likely organisms	Drug	Dose	Duration
Dysentery	Shigella Campylobacter	I.V. Ceftriaxone Cefixime	100mg/kg/day BD 20mg/kg/day BD	7 days 7 days
Cholera	Vibrio cholerae	Azithromycin Doxycycline	20mg/kg/day OD 4 mg/kg/day BD	5 days 7-10 days
Enteric fever	Samonella typhi, Salmonella paratyphi	Cefixime Azithromycin I.V. Ceftriaxone I.V. Cefotaxime	20mg/kg/day BD 20mg/kg/day OD 100 mg/kg/day BD 100mg/kg/day TDS	14 days 5 days 14 days 14 days
		2nd line drugs:		
		Chloramphenicol Amoxycillin Cotrimoxazol e	50-75mg/kg/day BD 75-100mg/kg/day BD/TIDTMP: 8 mg/kg/day SMX: 40 mg/kg/day BD	14 days 14 days 14 days
Peritonitis	E.coli, S.pneumoniae , S.viridans	I.V. Ampicillin I.V. Cefotaxim PLUS Gentamycin	100 mg/kg/day 100 mg/kg/day 5-6 mg/kg/day	7-10 days 7-10 days 7-10 days
Liver abscess				
If pyogenic	E.coli, Klebsiella pneumoniae, streptococcal sp., bacteroids sp.	I.V. Ampicillin I.V. Cefotaxim PLUS I.V. Gentamycin I.V. Amikacin	100mg/kg/day 100mg/kg/day 5-6 mg/kg/day 15-20 mg/kg/day	2-6 wks 2-6 wks 2-6 wks
If amoebic	E. histolytica	I.V. Metronidazole I.V. Tinidazole PLUS Paromomycin Iodoquinol	30-50 mg/kg/day 50 mg/kg/day 30 mg/kg/day 30 mg/kg/day	10-14 days 5 days 7 days

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

IX. D. Pediatric Urinary Tract Infections

Condition	Most likely organisms	Drug	Dose	Duration
Urinary Tract Infection	E. coli, Klebsiella, Proteus, Staphylococcus saprophytius, Enterococcus	Parenteral drugs: (if pyelonephritis)		
		Ceftriaxone	75-100mg/kg/day BD	Switch to oral following clinical response (7-10 days total)
		CefotaximAmikacin	100-150 mg/kg/day TDS 10-15 mg/kg/day OD	
	If mild cystitis (3-5 days)	Gentamycin	5-6 mg/kg/day OD	
		Oral drugs:		
		Cefixime Ciprofloxacin Coamoxiclav Ofloxacin	8-10 mg/kg/day BD 10-20mg/kg/day BD30-35 mg/kg/day BD 15-20 mg/kg/day BD	7-10 days 7-10 days 7-10 days 7-10 ays

IX. E. Febrile Neutropenia in children

Condition	Most likely organisms	Drug	Dose	Duration
Febrile Neutropenia	Staphylococcus aureus Pseudomonas aeruginosa Candida Enterococcus	I.V. Ceftazidime +I.V. Amikacin I.V. Piperacillin Tazobactem I.V. Vancomycin	150mg/kg/day TDS 15-20 mg/kg/day BD300mg/kg/day TDS 40mg/kg/day QID	

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

IX. F. Pediatric Bone & Joint Infections

Condition	Most likely organisms	Drug	Dose	Duration
Osteomyelitis/Septic Arthritis	Staphylococcus aureus,Group B Streptococci, Gram negative bacilli pseudomonas	I.V. Coamoxyclav I.V. Gentamycin	100mg/kg/day BD 7.5 mg/kg/day OD/BD	4-6 weeks 4-6 weeks
		2nd line drugs		
		I.V. Ceftriaxone I.V. Cefotaxim I.V. Vancomycin	100 mg/kg/day BD 100 mg/kg/day TDS 60 mg/kg/day TDS	4-6weeks

IX. G. Tetanus in children

Condition	Most likely organisms	Drug	Dose	Duration
Tetanus	C. tetani	Crystalline Penicillin I.V. Metronidazole	1-2 lac unit/kg/day QID 30mg/kg/day TDS	10 days 10 days

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

IX. H. Acute Infective Endocarditis

Condition	Most likely organisms	Drug	Dose	Duration
Acute Infective Endocarditis	Streptococcus viridians, Staph aureus are the leading causative organism Others are group D Streptococcus, Serratia marsecens, Pseudomonas aeruginosa,	Crystalline Penicillin I.V. Ampicillin + Gentamycin/ Amikacin	2 lac units/kg/day 200mg/kg/day QID 7.5/15 mg/kg/day B.D.	4-6 weeks
		2nd line drugs		
		I.V. Ceftriaxone I.V. Vancomycin I.V. Meropenem +Amikacin/Gentamicin	100 mg/kg/day B.D. 40-60 mg/kg/day TDS 60-120 mg/kg/day TDS 7.5/15 mg/kg/day B.D	
Secondary prophylaxis	Group A Streptococcus	I.M. Benzathine Penicillin Oral Penicillin V Oral erythromycin	1.2 million units 250 mg QID 250 mg QID	Single dose10 days 10 days
		I.M. Benzathine Penicillin Oral penicillin V Oral Erythromycin	>30kg: 1.2 million units <30kg: 0.6 million units 250 mg BD 250 mg BD	Every 3 weeks

IX. I. Cellulitis

Condition	Most likely organisms	Drug	Dose	Duration
Cellulitis	Staphylococcus aureus, Streptococcus sp.	I.V. Cloxacillin I.V. Cefazolin I.V. Clindamycin	50-100mg/kg/day QID 100 mg/kg/day TDS 30mg/kg/day TDS	7-10 days 7-10 days 7-10 days

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

IX. J. Neonatal Sepsis

Condition	Most likely organisms	Drug	Dose	Duration
Community Acquired	GBS, Staph aureus, Gram negative bacilli (E.coli, klebsiella)	I.V. Ampicillin I.V. Gentamicin	100mg/kg/day 5-8mg/kg/day	10-14 days
Hospital Acquired (low probability of resistant strain)	Staphylococcus, CONS	I.V. Ampicillin I.V. Cloxacillin PLUS I.V. Amikacin	100 mg/kg/day 50 mg/kg/day 15 – 20 mg/kg/day	
Hospital Acquired (High Probability of resistant strain)	Staphylococcus, Gram negative bacilli, Pseudomonas	I.V. Cefotaxim I.V.Meropene m PLUS I.V. Amikacin	100 mg/kg/day 15-20 mg/kg/day	

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

X. Surgical Antimicrobial Prophylaxis

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

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 4.5gm or Inj.Cefaperazone- Sulbactam 2gm IV stat
Cardiothoracic	Inj.Cefuroxime 1.5gm IV stat & BD for 48hrs
Colonic surgery	Inj.Cefaperazone- Sulbactam 2gm IV stat & BD for 24hrs(maximum)
Abdominal surgery (hernia)	Inj.Cefazolin 2gm or Inj.Cefuroxime 1.5gm IV stat
Head & Neck/ ENT	Inj.Cefazolin 2gm IV stat
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 24 hrs(maximum) or Inj.Cefazolin 2gm IV stat Open reduction of closed fracture with internal fixation- Inj.Cefuroxime 1.5gm IV stat and q12h or Inj.Cefazolin 2gm IV stat and q 12h for 24 hrs
Trauma	Inj.Cefuroxime 1.5gm IV stat and q 12h (for 24 hrs) or Inj.Ceftriaxone 2gm IV OD
Urologic procedures	Antibiotics only to patients with documented bacteriuria
Trans- rectal prostatic surgery	Inj.Cefaperazone- Sulbactam 2gm IV stat

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

X. A. Paediatric Surgical Cases

Clean Surgery	Clean Surgery likely to be contaminated	Contaminated/dirty Surgery or Peritonitis
Surgeries like Uncomplicated Hernia, cyst excision, hydrocoele - No Pre- operative prophylaxis needed **For all other surgeries under thisgroup:** Inj Ceftriaxone 50 – 75 mg/kg/day I.V or I/M single dose half an hour before surgery	**For GI surgeries** Inj Ceftriaxone 50 – 75 mg/kg/day, I.V or I/M 12 hly doses AND Metronidazole 20 – 30 mg/kg/day I/V every 8 hrly Given for 48hrs only. **Urinary tract surgeries** Inj Ceftriaxone 50 – 75 mg/kg/day I.V or I/M 12hrly doses Do not continue beyond 48hrs of surgery	**All surgeries under this group** Inj Ceftriaxone 50 – 75 mg/kg/day, I.V or I/M 12hrly doses AND Metronidazole 20 – 30 mg/kg/day I/V every 8 hrly AND Gentamicin 7.5mg/kg/d 24hrly IV or IM **2nd Line** Piperacillin + Tazobactam (200-300 mg/kg/day IV in 3-4 div doses) + Vancomycin (40 mg/kg/day IV in 4 divided doses)

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

NBSU Antibiotic Policy

Table 1: **Predictive 'risk scores' for early onset sepsis**

Risk score

1. Low birth weight or preterm
2. Febrile illness in mother within 2 weeks prior to delivery
3. Foul smelling and/or meconium stained amniotic fluid
4. Prolonged rupture of membranes >24 h
5. More than 3 vaginal examinations during labor
6. Prolonged and difficult delivery with instrumentation
7. Perinatal asphyxia (Apgar score <4 at 1 minute) or difficult resuscitation

Interpretation:

Presence of > 2 risk factors: do sepsis screen

Foul smelling liquor or presence of three risk factors: start antibiotics

Figure 1: **Management of asymptomatic neonate with risk factors**

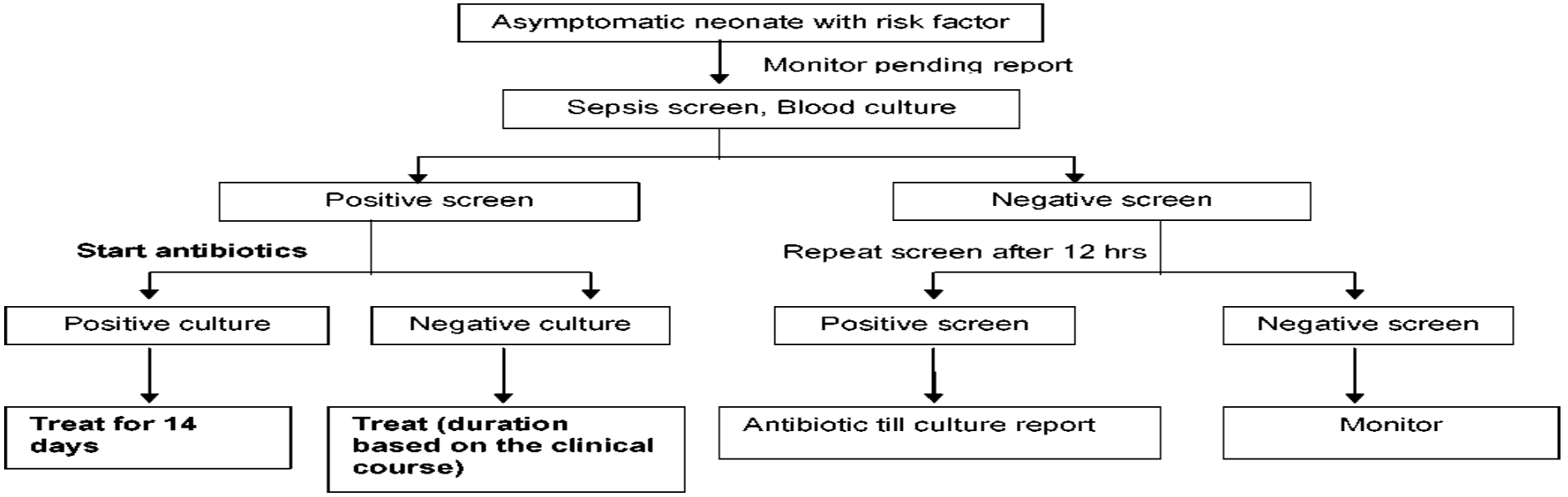


Table 2: **Examples of sepsis screen**

Screen panel

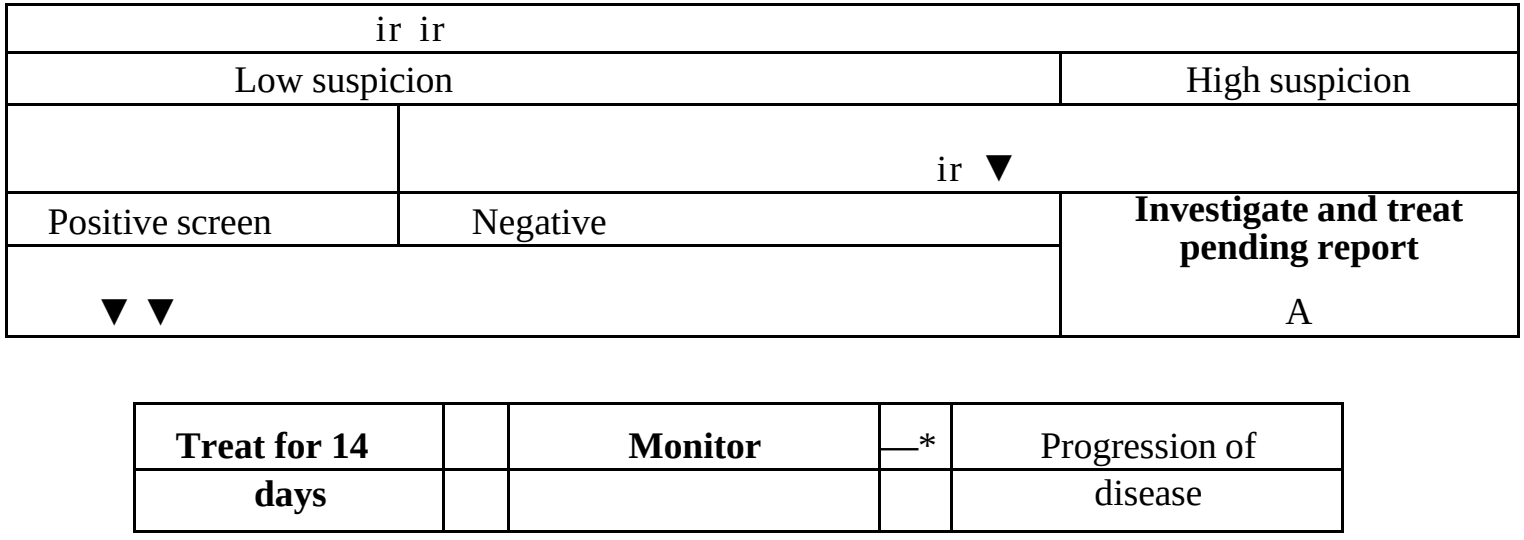
1. Total leukocyte count <5000/mm3
2. Absolute neutrophil count <1500/mm^3
3. Immature/total neutrophils >0.2
4. Micro-ESR >15 mm in 1st hour
5. C-reactive protein >1 mg/dL

Interpretation:

- if two or more tests are positive, infant should be treated for possible sepsis;
- if none/one test is positive, screen to be repeated after 12 hours (if clinical suspicion still persists).

Symptomatic neonate

Figure 2: **Management of neonate with symptoms suggestive of sepsis**



A. Choice of antibiotics

Table 3: Empirical Choice of Antibiotics

	First Line	2nd Line (If clinical deterioration or no responseafter 48 -72 hrs of 1st Line drugs)	3rd Line (If clinical deterioration orno response after 48 -72 hrs of 2nd Line drugs)	Rema rks
EOS with positive sepsis screen (n=16)*	Ampicillin + Gentamicin	Piperacillin-Tazobactam + Amikacin	Meropenem + Vancomycin	Always Deescalate/Escalate antibiotics afterCulture report
Community acquired sepsis (n=15)*	Ampicillin + Gentamicin	Piperacillin-Tazobactam + Amikacin	Meropenem + Vancomycin	Always Deescalate/Escalate antibiotics afterCulture report
Nosocomial sepsis (n=17)	Piperacillin-Tazobactam + Amikacin	Meropenem + Vancomycin	Colistin +/-Amphotericin B +/- Lionezolid	Always Deescalate/Escalate antibiotics afterCulture report

Table 3 provides a typical example of an empirical regimen suggested for use in facility settings.[10]

The initial choice of antibiotics for sepsis is almost always empirical because the culture reports would be available after only 48-72 hours. The antibiotics thus started can either be continued as such or modified based on the culture report and/or the clinical condition of the infant. Knowledge about the prevalent microbial flora and their sensitivity/resistance pattern in a particular unit and the common antibiotics used in the neonatal period - their side-effects and the organisms susceptible as well as resistant to them - are essential to rationalize the empirical antibiotic therapy for the unit.

Table 4: **Suggested regimen for first line antibiotic therapy in facility settings***

- Early and late onset sepsis: ampicillin plus gentamicin
- Early onset meningitis: ampicillin plus gentamicin
- Late onset meningitis: ampicillin, gentamicin (or amikacin), and/or cefotaxime
- Suspected staphylococcal sepsis, focal skin, bone, joint infections, omphalitis: Cloxacillin plus gentamicin
- For sepsis of suspected GI origin: ampicillin, gentamicin/amikacin, plus clindamycin (or piperacillin)
- Nosocomial infection in setting with MRSA: vancomycin plus gentamicin (and/or ceftazidime, if high prevalence of pseudomonas)

* *Source: From the report of WHO meeting to "Explore simplified antimicrobial regimens for the treatment of neonatal sepsis*

Given the varied microbial flora and the diverse antimicrobial sensitivity pattern, it is practically impossible to put-forth a single policy for allthe units ; instead, we have tried to lay down broad guidelines for choosing the first line and the reserve antibiotics for any neonatal unit:

1. First, collect the data on the prevailing flora and their sensitivity pattern of your unit for the previous 6-12 months
2. Decide the first line of antibiotics based on the following principles:
    - **o** Identify a narrow-spectrum antibiotic which covers at least 60-70% of the three most common organisms isolated from the unit.(Though this strategy appears counterintuitive, it is employed because the information from a small proportion of infants with culture positive sepsis (<30%) is being extrapolated to other neonates for whom no information is available; also, in morethan two-third of the instances, the selected agent would usually work)
    - **o** Identify an aminoglycoside to be used with the selected agent for synergistic action -again following the same principles (in some instances, aminoglycoside alone would suffice)
    - **o** Avoid using broad spectrum antimicrobials such as 3rd generation cephalosporins as the first-line agent (unless the resistance pattern demands such regime). Using antibiotics like piperacillin-tazobactam might be a better choice because unlike the former, it does not select for extended spectrum beta lactamase (ESBL) producing gram negative bacilli. Moreover, the combination of piperacillin-tazobactam and amikacin is effective for suspected pseudomonas sepsis also.
3. Decide the next line of antibiotics based on these principles:
    - **o** These antibiotics should be able to cover almost all the organisms isolated in the given unit.
    - **o** Further categorization into second/third line and reserve drugs should depend upon other considerations like cost, spectrum ofactivity, safety profile, etc.

- In units with high incidence of infections with cloxacillin or methicillin resistant *Staphylococcus aureus* (MRSA), vancomycin might have to be considered as a second/third line agent
- Newer antibiotics like aztreonam, imipenem, and meropenem should be reserved for situations where sensitivity of the isolate justifies their use.

  Aztreonam has excellent activity against gram-negative organisms while meropenem is effective against most bacterial pathogens except MRSAand *enterococcus.* Imipenem is usually avoided in neonates because of the reported increase in the risk of seizures after their use.

Table 5: **Duration of antibiotic therapy in neonatal sepsis**

Diagnosis	Duration
Meningitis (with or without positive blood/CSF culture)	21 days
Blood culture positive but no meningitis	14 days
Culture negative but definite clinical sepsis	10-14 days
Culture negative, sepsis screen positive and clinical course consistent with sepsis	7-10 days
Culture and sepsis screen negative, but clinical course compatible with sepsis	5-7 days

A. Route and dose of antibiotic therapy

Either intravenous or intramuscular routes are usually preferred while treating neonatal sepsis. Oral antibiotic therapy is avoided because of the unpredictable absorption and bioavailability especially in seriously ill neonates. Many community based studies have successfully used oral cotrimoxazole for management of pneumonia.[15] Owing to the paucity of data regarding use of oral antibiotics in hospital settings,

it cannot be recommended presently.

The dosage, route, and the frequency of administration of commonly used antimicrobial agents are given in *Table 6.*

Table 6a: Dosages (mg/kg/dose) of commonly used antimicrobial agents - **Aminoglycosides**[16]

Drug	Route	<29 weeks PMA		30 to 34 weeks PMA		>35 weeks PMA	
		0-7 days	**8-28 days**	**0-7 days**	**8-28 days**	**0-7 days**	**8-28 days**
Amikacin	IV Infusion over 30 min	18 q48h	15 q36h	18 q36h	15 q24h	15 q24h	15 q24h
Gentamicin	IV Infusion over 30 min	5 q48h	4 q36h	4.5 q36h	4 q24h	4 q24h	4 q24h
Netilmicin	IV Infusion over 30 min	5 q48h	4 q36h	4.5 q36h	4 q24h	4 q24h	4 q24h

(PMA, postmenstrual age; IV, intravenous)

Table 6b: **Dosages (mg/kg/dose) of commonly used antimicrobial agents (other than aminoglycosides)**

Drug	Route	<29 weeks PMA		30 to 36 weeks PMA		>37 weeks PMA	
		0-7 days	8-28 days	0-14 days	14-28 days	0-7 days	8-28 days
Ampicillin	IV slow push						
Meningitis		100 q12h	100 q12h	100 q12h	100 q8h	100 q12h	100 q8h
Others		50 q12h	50 q12h	50 q12h	50 q8h	50 q12h	50 q8h
Cefotaxime	IV Infusion over 30 min	50 q12h	50 q12h	50 q12h	50 q8h	50 q12h	50 q8h
Ciprofloxacin		10-20 q24h	10-20 q24h	10-20 q24h	10-20 q12h	10-20 q24h	10-20 q12h
Cloxacillin		50 q12h	50 q8h	50 q12h	50 q8h	50 q 8h	50 q6h
Meropenem							
Meningitis/	IV Infusion over 30 min	40 q8h	40 q8h	40 q8h	40 q8h	40 q8h	40 q8h
Pseudomonas sepsis Sepsis due to other		20 q12h	20 q12h	20 q12h	20 q12h	20 q12h	20 q12h
organisms							
Penicillin G (Units/kg/day)	IV Infusion over 30 min						
Meningitis		75,000-100,000	75,000-100,000	75,000-100,000	75,000-100,000	75,000-100,000	75,000-100,000
		q12h	q12h	q12h	q8h	q12h	q8h
Others		25000 -50000	25000 -50000	25000 -50000	25000 -50000	25000 -50000	25000 -50000
(PMA, postmenst rual age; IV, intravenous)		q 12h	q12h	q12h	q8h	q12h	q8h
Piperacillin + tazobactam	IV Infusion over 30 min	50-100 q12h	50-100 q12h	50-100 q12h	50-100 q8h	50-100 q12h	50-100 q8h
Vancomycin							
Meningitis	IV Infusion over 60 min	15 q18h	15 q12-18h	15 q12h	15 q8h	15 q12h	15 q8h
Others		10 q18h	10 q12-18h	10 q12h	10 q8h	10 q12h	10 q8h

B. Special situations

The use of prophylactic antibiotics for infants on IV fluids/TPN, meconium aspiration syndrome, or after exchange transfusions is not recommended. An exchange transfusion conducted under strict asepsis (single use catheter, sterile gloves, removal of catheter after the procedure) does not increase the risk of sepsis. As for antibiotic prophylaxis in ventilated neonates is concerned, there is not enough evidence to either support or refute its use

(Cochrane review).

Minimizing antibiotic resistance in neonatal units

Recently in his editorial titled ‘The antibiotic crisis’, Isaacs D has pointed out that unlike other countries, the situation of antibiotic resistance in Indian neonatal units has reached crisis level.[18] The reasons attributed for this phenomenon include: not taking blood cultures before staring antibiotics, continuing antibiotics even after a negative culture report, adding more potent broad spectrum antibiotics if the baby remains ‘sick’, and the belief that raised CRP is proof of sepsis. It is the duty of every physician involved in the care of newborns to develop as well as implement both local and national guidelines on antibiotic use in neonates and to ensure that the menace of antibiotic resistance does not continue unabated.

Thank You