Antibiogram Infectious Diseases/Microbiology Department

BKMC Swabi January to June 2024

Objective:

The objective of circulating this antibiogram is to help clinical colleagues in choosing the appropriate empirical antimicrobial therapy against suspected microorganisms. This antibiogram is data collection of antibiotic susceptibility pattern of isolates yielded from various clinical specimens submitted at Microbiology Department, BKMC Swabi.

HOW TO USE THIS ANTIBIOGRAM?

The figures in the boxes represent the %age resistant isolates against a particular antibiotic.

IR means the isolate is INTRINSICALLY RESISTANT against the drug. It should not be used clinically, and does not require testing. Resistance to Cloxacillin/ Oxacillin indicates methicillin resistance, and the isolates are labeled MRSA. Such isolates are resistant to all currently available B- lactam antimicrobials with exception of newer cephalosporins having anti-MRSA activity I.e. Ceftaroline, Ceftobiprole.

CLSI guideline M-39-A3 suggests making antibiogram when isolates number (n) is > 30. In case where n is < 30, the interpretation may be impaired due to small number.

All sensitivity results are interpreted according to Clinical Laboratory Standard Institute (CLSI) 2023, 34th Ed. S100,.

DISCLAIMER

Aim of this Antibiogram is to provide users with an overview of antimicrobial susceptibility profiles for specific microorganisms. This can be helpful in guiding the choice of empiric antimicrobial therapy, supporting antimicrobial stewardship programs in the development of local treatment guidelines, aiding in monitoring resistance trends over time, and formulary management.

BKMC Swabi routinely prepares antibiograms for bacterial isolates to inform local health networks and clinicians. These are generally presented to summaries the susceptibilities for urine, blood and non-urine/ non-blood isolates (for example, sputum or wound culture results).

GENERAL GUIDELINES REGARDING ANTIMICROBIAL STEWARDSHIP

Due to increase in antimicrobial resistance (AMR) and the impending threat of post antibiotic era, Antibiotic Stewardship is the NEED OF THE HOUR. Antimicrobial stewardship is the systematic effort to educate and persuade prescribers of antimicrobials to follow evidence-based prescribing, in order to stem AMR. Following are few general guidelines helpful for the prescribing doctors:

1. **Before prescribing antibiotic, consider if it actually is a bacterial illness and are antibiotics really needed? Most URTs and diarrheas are viral that are self-limited and need nothing more than symptomatic treatment.**
2. **Always remember 5 'Ds' of Antibiotic Stewardship. The right Diagnosis, the right Drug, in the right Dose, for the right Duration and then De-escalation.**
3. **For outdoor patients, oral empirical antibiotics, appropriate according to the site of infection and causative agent, can be prescribed. Generally, community acquired bacteria are sensitive to most antibiotics.**
4. **For inpatients or healthcare associated infections, always send appropriate samples for cultures. If patient has severe infection and cannot wait for culture results, start with a broad-spectrum drug appropriate for coverage of likely causative agent. However, once culture and sensitivity result is available, always de-escalate to a narrow spectrum antibiotic whenever choice is available.**
5. **Hand hygiene in busy hospital routine. It is surely the single best measure to stop the spread of hospital acquired pathogens.**
6. **For patients confirmed to have multidrug resistant pathogens on culture and sensitivity report, please take due infection control precautions/ contact-based precautions to prevent their spread to other patients in the ward.**
7. **The common use of oral Azithromycin for upper respiratory tract must be curtailed to save this drug for treatment of typhoid/ enteric fever caused by XDR Salmonella Typhi strain.**

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BKMC Swabi Year 2023

E COLI % RESISTANCE

	N	CRO	CTX	AMC	CIP	AK	CN	SCF	TZP	ERT	IMP	MEM	FOS	F
OPD	105	99	99	99	95	11	24	88	18	04	04	04	05	29
IPD	230	228	228	225	224	28	33	188	49	23	13	13	22	44
Urine	235	229	229	227	223	06	27	204	28	19	01	01	27	73
Blood	16	16	16	16	16	02	01	16	10	02	04	04		
PUS	73	72	72	71	70	28	14	47	27	05	09	09		
Others	11	11	11	11	10	02	05	09	02	01	03	03		
Total	**335**													

KLEBSIELLA PNEUMONIAE % RESISTANCE

	N	CRO	CTX	AMC	CIP	AK	CN	SCF	TZP	ERT	IMP	MEM	FOS	F
OPD	18	17	17	16	14	08	08	14	04	01	04	04	08	12
IPD	69	65	65	66	59	36	14	39	36	17	29	29	26	20
Urine	33	29	29	28	30	14	02	22	12	06	08	08	34	32
Blood	06	06	06	06	06	06	06	05	04	02	05	05		
PUS	38	37	37	38	30	20	12	22	22	06	14	14		
Others	10	08	08	08	07	04	02	04	02	04	06	06		
Total	**87**													

PSEUDOMONAS- AERUGINOSA % RESISTANCE

	N	CZA	FEP	CIP	AK	CN	TZP	IMP	MEM		P. Aeruginosa Intrinsic Resistance	
OPD	17	08	07	10	13	09	06	02	02		1.	**Ampicillin**
IPD	64	34	55	56	59	40	45	36	36		2.	**Amoxicillin**
Urine	15	09	11	12	13	08	05	05	05		3.	**Ampicillin + Sulbactum**
Blood	04	03	02	03	04	04	02	00	00		4.	**Amoxicillin + Clavulanate**
PUS	35	18	30	30	31	26	24	22	22		5.	**Cefotaxime**
Others	27	22	19	21	24	14	20	11	11		6.	**Ceftriaxone**
Total	**81**										7.	**Ertapenem**
											8.	**Tetracycline (Doxycycline)**
											9.	**Trimethoprime + Sulfamethoxazole**

SALMONELLA TYPHI % RESISTANCE

	N	AMP	CRO	CTX	CIP	IMP	MEM	AZM
OPD	21	19	18	18	21	00	00	00
IPD	49	48	46	46	49	00	00	00
Blood	70	67	64	64	70	00	00	00
Others								
Total	**70**							

MRSA % RESISTANCE

	N	PEN	AMP	AMC	AK	CN	VA	LNZ	SXT	DO	CIP
OPD	23	23	23	23	03	04	00	00	08	11	17
IPD	102	102	102	102	15	22	00	00	42	42	78
Urine	00	00	00	00	00	00	00	00	00	00	00
Blood	09	09	09	09	01	02	00	00	04	06	08
PUS	94	94	94	94	14	18	00	00	28	35	68
Others	22	22	22	22	03	06	00	00	18	12	19
Total	**125**										

MSSA % RESISTANCE

	N	PEN	AMP	AMC	AK	CN	VA	LNZ	SXT	DO	CIP
OPD	10	06	06	07	00	00	00	00	04	02	06
IPD	12	08	08	08	00	00	00	00	04	02	07
Urine	00	00	00	00	00	00	00	00			
Blood	00	00	00	00	00	00	00	00	00	00	00
PUS	16	12	12	13	00	00	00	00	06	03	10
Others	06	02	02	02	00	00	00	00	02	01	03
Total	**22**										

ENTEROCOCCUS % RESISTANCE

	N	AMP	TZP	VA	LNZ	DO	Lev	FOS	F		Enterococcus Intrinsic Resistance
OPD	18	08	08	00	00	12	11	08	04		**Trimethoprim + Sulfamethoxazole**
IPD	73	41	41	01	00	49	65	48	16		**Cephalosporins**
Urine	73	39	39	01	00	46	68	56	20		**Clindamycin**
Blood	00										**Aminoglycosides** (Except high level resistance testing)
PUS	05	04	04	00	00	04	03				
Others	13	06	06	00	00	11	05				
Total	**91**										

CANDIDA SPP % RESISTANCE

	N	FLU	VOR
OPD	07	01	01
IPD	26	03	03
Urine	28	04	04
PUS	05	00	00
Others (Blood)	03	01	01
Total	**36**		

OTHER ISOLATES (N<30)

	N
Streptococcus pyogenes	06
Streptococcus pneumoniae	04
Streptococcus spp	03
Salmonella Paratyphi	22
Citrobacter freundii	02
Proteus mirabilis	24
Enterobacter spp	20
Candida Tropicalis	04
Candida Albicans	20
Stenotrophomonas maltophilia	02
Burkholderia cepacia	01
Moraxella catarrhalis	01

ISOLATE	NUMBER	PERCENTAGE
E Coli	335	35.94 %
Klebsiella pneumoniae	87	09.33 %
Salmonella Typhi	70	07.51 %
P Aeruginosa	81	08.69 %
MRSA	125	13.41 %
Enterococcus	91	09.76 %
Staph Aureus	22	02.36 %
Candida spp	36	03.86 %
Streptococcus pyogenes	06	0.64 %
Streptococcus pneumoniae	04	0.42 %
Streptococcus spp	03	0.32 %
Salmonella Paratyphi	22	02.36%
Citrobacter spp	02	0.21 %
Proteus mirabilis	24	02.57 %
Enterobacter spp	20	2.14 %
Candida Tropicalis	04	0.42 %
Total	932	
TOTAL CULTURE PERFORMED IN Jan to June 2024	5231	

KEY	
AMP	Ampicillin
PEN	Penicillin
AMC	Amoxicillin + clavulanic acid
SCF	Cefoperazone + Sulbactam
TZP	Piperacillin + Tazobactam
CRO	Ceftriaxone
CTX	Cefotaxime
CZA	Ceftazidime
FOX	Cefoxitin
CIP	Ciprofloxacin
LEV	Levofloxacin
MXF	Moxifloxacin
ERT	Ertapenem
IPM	Imipenem
MEM	Meropenem
AK	Amikacin
CN	Gentamycin
TOB	Tobramycin
DO	Doxycycline
LNZ	Linezolid
VA	Vancomycin
AZM	Azithromycin
FOS	Fosfomycin
F	Nitrofurantoin
FLU	Fluconazole
VOR	Voriconazole

WHO AWaRe CLASSIFICATION OF ANTIBIOTICS

A tool for antibiotic stewardship to reduce antimicrobial resistance (AMR)

ACCESS

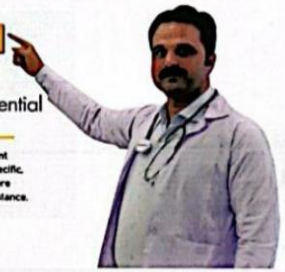
Narrow spectrum, low resistance potential antibiotics.

Drugs of choice for most common infections, offer the best therapeutic value, lower propensity for developing resistance, should be widely accessible.

WATCH

Broad-spectrum, high resistance potential antibiotics.

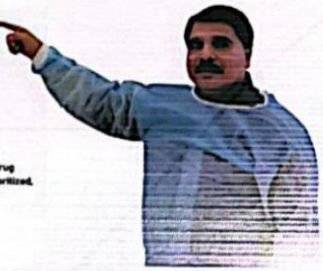
High-priority, critically important antimicrobials only indicated for specific, limited number of infections, more prone to be a target of antibiotic resistance.



RESERVE

Antibiotics of last resort.

Highly selected patients (life-threatening infections due to multi-drug resistant bacteria), closely monitored and prioritized, targets of stewardship programs to ensure continued effectiveness.



ACCESS				WATCH				RESERVE			
Amikacin	Cefcapene-pivoxil	Ceftibuten		Faropenem	Loracarbef	Oxolinic-acid		Rufloxacin		Sulfametrole/[illegible]	
Amoxicillin	Cefdinir	Ceftizoxime		Fidaxomicin	Lymecycline	Oxytetracycline		Sarecycline		Sulfamoxole	
Amoxicillin/clavulanic-acid	Cefditoren-pivoxil	Ceftobiprole-medocaril		Fleroxacin	Mecillinam	Panipenem		Secnidazole		Sulfamoxole/trimethoprim	
Ampicillin	Cefepime	Ceftolozane/tazobactam		Flomoxef	Meropenem	Pazufloxacin		Sisomicin		Sulfanitamide	
Amp[illegible]/sulbactam	Cefetamet-pivoxil	Ceftriaxone		Flucloxacillin	Meropenem/vaborbactam	Pefloxacin		Sitafloxacin		Sulfaperin	
Arbekacin	Cefiderocol	Cefuroxime		Flumequine	Metacycline	Penamecillin		Solithromycin		Sulfaphenazole	
Aspoxicillin	Cefixime	Chlortetracycline		Flurithromycin	Metampicillin	Penimepicycline		Sparfloxacin		Sulfapyridine	
Azidocillin	Cefmenoxime	Cinoxacin		Fosfomycin_IV	Meticillin	Pheneticillin		Spectinomycin		Sulfathiazole	
Azithromycin	Cefmetazole	Ciprofloxacin		Fosfomycin_oral	Metronidazole_IV	Phenoxymethylpenicillin		Spiramycin		Sulfathiourea	
Azlocillin	Cefminox	Clarithromycin		Furazidin	Metronidazole_oral	Pipemidic-acid		Streptoduocin		Sultamicillin	
Aztreonam	Cefodizime	Clindamycin		Fusidic-acid	Mezlocillin	Piperacillin		Streptomycin_IV		Talampicillin	
Bacampicillin	Cefonicid	Clofoctol		Garenoxacin	Micronomicin	Piperacillin/tazobactam		Streptomycin_oral		Tazobactam	
Bekanamycin	Cefoperazone	Clometocillin		Gatifloxacin	Midecamycin	Piromidic-acid		Sulbactam		Tebipenem	
Benzathine-benzylpenicillin	Ceforanide	Clomocycline		Gemifloxacin	Minocycline_IV	Pivampicillin		Sulbenicillin		Tedizolid	
Benzylpenicillin	Cefoselis	Cloxacillin		Gentamicin	Minocycline_oral	Pivmecillinam		Sulfadiazine		Teicoplanin	
Biapenem	Cefotaxime	Colistin_IV		Grepafloxacin	Miocamycin	Plazomicin		Sulfadiazine/tetroxoprim		Telavancin	
Brodimoprim	Cefotetan	Colistin_oral		Hetacillin	Moxifloxacin	Polymyxin-B_IV		Sulfadiazine/trimethoprim		Telithromycin	
Carbenicillin	Cefotiam	Dalbavancin		Iclaprim	Nafcillin	Polymyxin-B_oral		Sulfadimethoxine		Temafloxacin	
Carindacillin	Cefoxitin	Dalfopristin/quinupristin		Imipenem/cilastatin	Nemonoxacin	Pristinamycin		Sulfadimidine		Temocillin	
Carumonam	Cefozopran	Daptomycin		Imipenem/cilastatin/relebactam	Neomycin_IV	Procaine-benzylpenicillin		Sulfadimidine/trimethoprim		Tetracycline	
Cefacetrile	Cefpiramide	Delafloxacin		Isepamicin	Neomycin_oral	Propicillin		Sulfafurazole		Thiamphenicol	
Cefaclor	Cefpirome	Demeclocycline		Josamycin	Netilmicin	Prulifloxacin		Sulfaisodimidine		Ticarcillin	
Cefadroxil	Cefpodoxime-proxetil	Dibekacin		Kanamycin_IV	Nifurtoinol	Ribostamycin		Sulfalene		Tigecycline	
Cefalexin	Cefprozil	Dicloxacillin		Kanamycin_oral	Nitrofurantoin	Rifabutin		[illegible]ifamazone		Tinidazole_IV	
Cefaloridine	Cefradine	Dirithromycin		Lascufloxacin	Norfloxacin	Rifampicin		Sulfamerazine		Tinidazole_oral	
Cefalotin	Cefroxadine	Doripenem		Latamoxef	Ofloxacin	Rifamycin_IV		Sulfamerazine/trimethoprim		Tobramycin	
Cefamandole	Cefsulodin	Doxycycline		Lefamulin	Oleandomycin	Rifamycin_oral		Sulfamethizole		Tosufloxacin	
Cefapirin	Ceftaroline-fosamil	Enoxacin		Levofloxacin	Omadacycline	Rifaximin		Sulfamethoxazole		Trimethoprim	
Cefatrizine	Ceftazidime	Epicillin		Levonadifloxacin	Oritavancin	Rokitamycin		Sulfamethoxazole/trimethoprim		Troleandomycin	
Cefazedone	Ceftazidime/avibactam	Eravacycline		Lincomycin	Ornidazole_IV	Rolitetracycline		Sulfamethoxypyridazine		Trovafloxacin	
Cefazolin	Cefteram-pivoxil	Ertapenem		Linezolid	Ornidazole_oral	Rosoxacin		Sulfametomidine		Vancomycin_IV	
Cefbuperazone	Ceftezole	Erythromycin		Lomefloxacin	Oxacillin	Roxithromycin		Sulfametoxydiazine		Vancomycin_oral	

Any drug or combination not mentioned in this list is **NOT RECOMMENDED**

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