CLINICAL ANTIBIOGRAM

Vanya Singh, Prasan K Panda, Chackappen, Minakshi Singh

What is a Clinical Antibiogram?

Summarizes antimicrobial susceptibility, right ID diagnosis, and clinical response data for bacterial isolates recovered by a microbiology laboratory over a defined period

Why is it required ?

For the clinician

- Deciding empirical therapy, while waiting for C/S reports
- Provides knowledge on prevalence of most common pathogens
- Provides guidance which therapy to choose in MDR, XDR, PDR pathogens

For the microbiologist

- Helps in antibiotic resistance monitoring and infection control
- Monitoring changes in susceptibility and resistance from year to year

For the administrator

- Policy formulation
- Optimizing resources

HOW TO MAKE A CLINICAL ANTIBIOGRAM

Components of Antibiogram

- Time Frame :- 6 months (June 24 –Nov 24)
- Name of Facility :- Department of General Medicine (ICU)
- Number of Isolates analyzed—30
- Percent susceptibility(Range 0 - 100%)

STEP1

- Data Collection of all pathogens
- Obtain culture and sensitivity data from the patient's lab records. –(Laboratory Antibiogram)

Step 2

- See and record clinical response to ongoing empirical antibiotics
  - ❖YES: Record these antibiotics as First Line antibiotic for the disease
  - ❖No: See list of Culture-sensitive antibiotics, and see their responses, then record

Step 3

- Calculation of total number of patient responded or not, to the given antibiotics

Step 4

- **Calculation of percentage susceptibility to given antibiotics**

$$\frac{\text{Total No of Pts susceptible + Pts responded to invitro resistant antibiotics – pts not responded to invitro susceptible antibiotics}}{\text{Total No of isolates}}$$

AIIMS RISHIKESH HOSPITAL ANTIBIOGRAM (POCKETGUIDE)

% susceptibility of organisms in BLOOD samples

Vanya Singh, Minakshi Singh

			Penicillins		BL-BLIs		Cephalosporins				Carbapanems			Mono-bactum	Quinolones		Anti-folate	Aminoglycoside			Tetracyclines			Poly myxins	Macrolide		Anti-Staph		Lincosamides	Glycopeptides		Others		
Gram Negative Organisms	Location	Total Number of Isolates	Penicillin	Ampicillin	Piperacillin Tazobactum	Amoxycillin Clavulonate	Cefuroxime	Ceftriaxone	Ceftazidime	Cefepime	Meropenem	Imipenem	Ertapenem	Aztreonam	Ciprofloxacin	Levofloxacin	Cotrimoxazole	Amikacin	Gentamycin	High-level Gentamycin	Tetracycline	Tigecycline	Minocycline	Colistin (%I)	Erythromycin	Azithromycin	Cefoxitin	Oxacilin	Clindamycin	Vancomycin	Teicoplanin	Linezolid	Daptomycin	Chloramphenicol
Acinetobacter baumani complex	IPD	219	x	x	14	x	x	x	28	13	16	14	x	x	17	17.3	28	17	17	x	x	x	54	97	x	x	x	x	x	x	x	x	x	x
Escherichia coli	OPD *	25*	x	x	52	NT	5	11	67	17	71	72	58	x	9	NT	28	76	42	x	x	x	x	100	x	x	x	x	x	x	x	x	x	x
	IPD	124	x	x	27	22	2.6	3.4	x	14	47	51	41	x	2	NT	22.2	65	66	x	x	x	x	99	x	x	x	x	x	x	x	x	x	x
Klebsilella pneumoniae	OPD *	14*	x	x	21	17	20	22	x	23	15	17	20	x	14	NT	21.4	21	21	x	x	x	x	93	x	x	x	x	x	x	x	x	x	x
	IPD	233	x	x	21	16	8.5	8.3	x	16	28	25	30	x	9	NT	17.5	25	22	x	x	x	x	93	x	x	x	x	x	x	x	x	x	x
Pseudomonas aerogenosa	OPD	9*	x	x	44	x	x	x	75	67	50	63	x	20	75	42.9	x	64	x	x	x	x	x	93	x	x	x	x	x	x	x	x	x	x
	IPD	78	x	x	43	x	x	x	59	53	45	52	x	36.4	43	38	x	50	x	x	x	x	x	91	x	x	x	x	x	x	x	x	x	x
Burkholderia cepacia complex	IPD	32	x	x	x	x	x	x	56	x	67	x	x	x	x	86.7	87.6	x	x	x	x	x	62	x	x	x	x	x	x	x	x	x	x	x
Enterobacter cloacae complex	IPD	33	x	x	55	x	x	x	40	50	64	64	x	x		x				x	x	x	x		x	x	x	x	x	x	x	x	x	x
Salmonella Typhi	OPD & IPD	45	x	89	x	x	x	83	x	x	100	x	x	x	0	0	95.5	x	x	x	x	x	x	x	x	62.1	x	x	x	x	x	x	x	
Stenotrophomas maltopholia	IPD	41	x	x	x	x	x	x	x	x	x	x	x	x	x	57.9	71.1	x	x	x	x	x	88	x	x	x	x	x	x	x	x	x	x	x
Gram Positive Organisms																																		
Staphylococcus aureus	OPD & IPD	34	2.9	x	x	x	x	x	x	x	x	x	x	x	3	2.9	50	x	44	x	79	100	x	x	38.2	x	18	16	x	100	100	100	100	x
Enterococcus faecium	IPD	50	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	22	x	100	x	x	x	x	x	x	x	55	x	58	x	x

*Less than 30 isolates; Values in boxes above represent % susceptible; X indicates not tested or intrinsically resistant or minimal isolates tested

HIGHLY SUSCEPTIBLE > 80% | MODERATE SUSCEPTIBLE 50-80 % | LESS SUSCEPTIBLE < 50%

AIIMS RISHIKESH HOSPITAL ANTIBIOGRAM (POCKETGUIDE)

% susceptibility of organisms in URINE samples

Vanya Singh, Minakshi Singh

		Penicillins		BL-BLIs		Cephalosporins				Carbapanems			Mono-bactum	Quinolones		Anti-folate	Aminoglycoside			Tetracyclines			Polymyxins	Macrolide		Anti-Staph	Lincosamides	Glycopeptides		Others					
Gram Negative Organisms	Total Number of Isolates	Penicillin	Ampicillin	Piperacillin Tazobactum	Amoxycillin Clavulonate	Cefuroxime	Ceftriaxone	Ceftazidime	Cefepime	Meropenem	Imipenem	Ertapenem	Aztreonam	Ciprofloxacin	Levofloxacin	Cotrimoxazole	Amikacin	Gentamycin	High-level Gentamycin	Tetracycline	Tigecycline	Minocycline	Colistin (%)	Erythromycin	Azithromycin	Cefoxitin	Clindamycin	Vancomycin	Teicoplanin	Linezolid	Daptomycin	Chloramphenicol	Fosfomycin	Nitrofurantoin
Acinetobacter baumani complex	OPD 55	x	x	60	x	x	x	45	30	67.50	56	x	x	29	34.1	37	60	54	x	x	x	74	100	x	x	x	x	x	x	x	x	x	x	x
	IPD 106	x	x	24	x	x	x	24	11	23.2	24	x	x	11	14.9	20	27	32	x	x	x	61	93	x	x	x	x	x	x	x	x	x	x	x
Escherichia coli	OPD 1033	x	x	46	34	31	20	27	17	71.3	67	66	x	9	NT	27	57	61	x	x	x	x	99	x	x	x	x	x	x	x	x	x	94	87.2
	IPD 1106	x	x	33	25	15	10	16	12	56.8	54	44	x	7	NT	22	53	50	x	x	x	x	98	x	x	x	x	x	x	x	x	x	96	86.50
Enterobacter cloacae complex	OPD 45	x	x	38	x	x	x	33	34	60.6	53	49	x	30	x	48	52	57	x	x	x	x	96	x	x	x	x	x	x	x	x	x	NA	NA
	IPD 55	x	x	35	x	x	x	22	31	51.1	37	x	x	35	x	36	37	31	x	x	x	x	95	x	x	x	x	x	x	x	x	x	82	62.5
Klebsilella pneumoniae	OPD 583	x	x	27	30	30	18	19	17	45.5	45	40	26.5	15	NT	24	37	43	x	x	x	x	94	x	x	x	x	x	x	x	x	x	72	49.9
	IPD 938	x	x	19	24	19	9	12	11	24.5	26	21	15.7	9	NT	16	25	27	x	x	x	x	63	x	x	x	x	x	x	x	x	x	72	51.6
Pseudomonas aeruginosa	OPD 283	x	x	48	x	x	x	43	31	51.7	49	x	37.1	28	28	x	50	x	x	x	x	x	NT	x	x	x	x	x	x	x	x	x	x	x
	IPD 430	x	x	31	x	x	x	28	19	30.2	32	x	25.9	17	17.4	x	32	x	x	x	x	x	96	x	x	x	x	x	x	x	x	x	x	x
Proteus mirabilis	OPD 51	x	13	84	30	17	23	32	26	84.1	NT	80	x	20	NT	13	43	29	x	x	x	x	x	x	x	x	x	x	x	x	x	x	93	x
	IPD 41	x	4.8	78	30	13	10	19	15	74.4	NT	68	x	14	NT	14	29	20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	na
Gram Positive Organisms																																		
Staphylococcus aureus	OPD 19 IPD 17		x	x	x	x	x	x	x	x	x	x	x	15	18	52	x	50	x	80	x	x	x	50	x	66	73	89	x	86	100	x	x	100
CONS	OPD 30	11	57	x	x	x	x	x	x	x	x	x	x	33	40	76	x	86	x	67	x	x	x		x	40	44	97	x	100	100	x	x	100
	IPD 29	17	x	x	x	x	x	x	x	x	x	x	x	46	48.1	58	x	65	x	70	x	x	x	NA	x	50	55	93	x	96.3	100	x	x	100
Enterococcus faecium	OPD 51	43	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	20	x	x	x	x	x	x	x	x	80	x	80	x	x	x	NA
	IPD 304	22	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	21	x	x	x	x	x	x	x	x	66	x	71.4	x	x	x	18.9
Enterococcus faecalis	OPD 110	95	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	30	x	x	x	x	x	x	x	x	98	x	94.3	97	x	x	96.2
	IPD 176	92	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	26.2	x	x	x	x	x	x	x	x	99	x	98.3	88	x	x	96.8

*Less than 30 isolates; Values in boxes above represent % susceptible; X indicates not tested or intrinsically resistant or minimal isolates tested

HIGHLY SUSCEPTIBLE > 80% | MODERATE SUSCEPTIBLE 50-80 % | LESS SUSCEPTIBLE < 50%

AIIMS RISHIKESH HOSPITAL ANTIBIOGRAM (POCKETGUIDE)

% susceptibility of organisms in PUS samples

Vanya Singh, Minakshi Singh

			Penicillins		BL-BLIs		Cephalosporins				Carbapanems			Mono-bactum	Quinolones		Anti-folate	Aminoglycoside			Tetracyclines			Polymyxins	Macrolide		Anti-Staph		Lincosamides	Glycopeptides		Others	
Gram Negative Organisms	Location	Total Number of Isolates	Penicillin	Ampicillin	Piperacillin Tazobactum	Amoxycillin Clavulonate	Cefuroxime	Ceftriaxone	Ceftazidime	Cefepime	Meropenem	Imipenem	Ertapenem	Aztreonam	Ciprofloxacin	Levofloxacin	Cotrimoxazole	Amikacin	Gentamycin	High-level Gentamycin	Tetracycline	Tigecycline	Minocycline	Colistin (%I)	Erythromycin	Azithromycin	Cefoxitin	Oxacilin	Clindamycin	Vancomycin	Teicoplanin	Linezolid	Daptomycin
Acinetobacter baumani complex	OPD	51	x	x	40	x	x	x	54	44	42	32	x	x	29.8	28.9	41.7	41.2	40.8	x	x	x	51.4	99	x	x	x	x	x	x	x	x	x
	IPD	197	x	x	11.3	x	x	x	26	11	6.2	7.1	x	x	6.4	7.6	14.2	14.6	12.1	x	x	x	44.6	96.7	x	x	x	x	x	x	x	x	x
Escherichia coli	OPD	86	x	x	51.9	35	16	19	17	24	71.6	74.4	67.5	x	1.3	x	22.2	71.9	62.6	x	x	x	x	98.6	x	x	x	x	x	x	x	x	x
	IPD	300	x	x	21	12	7.5	6.7	12	13	41.1	45.4	33.7	x	2.2	NA	18.6	52.7	50.9	x	x	x	x	99.6	x	x	x	x	x	x	x	x	x
Klebsilella pneumoniae	OPD	59	x	x	37.9	35	25	32	na	31	58.2	50	56.9	x	10.9	NA	39.2	56.3	51.9	x	x	x	x	100	x	x	x	x	x	x	x	x	x
	IPD	359	x	x	11.8	9.2	9.8	6.3	x	8.5	20.4	20.1	18.4	6.9	4.5	x	16.7	24.3	25.3	x	x	x	x	95.5	x	x	x	x	x	x	x	x	x
Pseudomonas aerogenosa	OPD	136	x	x	47.3	x	x	x	59	62	55.4	62.3	x	53.4	39.4	40.6	x	36.8	x	x	x	x	x	9.8	x	x	x	x	x	x	x	x	x
	IPD	250	x	x	32	x	x	x	39	40	34.4	34.6	x	32.2	28.2	29.6	x	30.8	x	x	x	x	x	94.8	x	x	x	x	x	x	x	x	x
Proteus mirabilis	IPD	43	x	x	90.5	41	36	29	x	34	66.7	25.6	78.3	x	11.9	NA	14.3	26.2	30.6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Enterobacter cloacae complex	OPD	53	x	x	28.3	x	x	x	21	27	44	39.6	38.5	x	13.7	x	34.6	49	34.6	x	x	x	x	100	x	x	x	x	x	x	x	x	x
Gram Positive Organisms																																	
Staphylococcus aureus	OPD	75	4.1	x	x	x	x	x	x	x	x	x	x	x	1.4	2.7	39	x	48.6	x	73	100	x	x	31.3	x	35	58	76	96	100	97	100
	IPD	38	3.3	x	x	x	x	x	x	x	x	x	x	x	5.8	3.8	48.6	x	45.2	x	89	100	x	x	22.9	x	48	51	81	100	100	97	100
CONS	OPD	94	5.9	x	x	x	x	x	x	x	x	x	x	x	27.3	23.3	45.4	x	48.2	x	61	100	x	x	19.1	x	29	25	56	95	100	96	96
	IPD	158	4.7	35	x	x	x	x	x	x	x	x	x	x	17.2	17.5	40	x	48.2	x	66	100	x	x	9	x	18	13	40	96	100	97	98

*Less than 30 isolates; Values in boxes above represent % susceptible; X indicates not tested or intrinsically resistant or minimal isolates tested

HIGHLY SUSCEPTIBLE > 80% | MODERATE SUSCEPTIBLE 50-80 % | LESS SUSCEPTIBLE < 50%

GENERAL MEDICINE ICU CLINICAL ANTIBIOGRAM (POCKETGUIDE)

Prasan K Panda, Chackappen

PERCENTAGE SUSCEPTIBILITY															
DISEASE	ORGANISM	Piperacillin-tazobactam	Meropenem	Cotrimoxazole	Amikacin	Colistin	Ceftriaxone	Imipenem	Ceftazidime	Gentamicin	Ertapenem	Ciprofloxacin	Levofloxacin	Tigecycline	Minocycline
PERCENTAGE SUSCEPTIBILITY															
HAP/ VAP	Acinetobacter baumanii (MC) N = 30	0	46.66	3.33	0	46.67	3*	0	0	0	0	0	6.6	-	-
	Klebsiella pneumonia** N= 30	3.33*	6.66*	3.33	3.33	33.33	0	0	0	3.33	0	0	0	0	3.33

Note: * Marked antibiotics can be given as empirical antibiotics for VAP as clinically responded despite invitro resistance, but only when susceptible ones are not available/contraindicated
**** Among 30 isolates of Klebsiella pneumonia , 2 were pan-resistant**

LEGEND	HIGHLY SUSCEPTIBLE (>80%)	MODERATELY HIGH SUSCEPTIBLE (60-80%)	LESS SUSCEPTIBLE (<60%)	SENSITIVE BUT OTHER C/S ANTIBIOTIC WAS GIVEN