

*In the name of God*

Report of  
Antibiotic-Susceptibility Profiles of  
Bacterial Pathogens  
Causing Bloodstream Infections  
in Shiraz in 1393 and first half of 1394:

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**Table 1: Frequency and percentage of pathogenic bacteria isolated from blood samples based on hospitals in Shiraz, 1393**

<b>Hospital</b>	<b>Number (%)</b>
Nemazee	<b>186(52)</b>
Amir	<b>115(32)</b>
Dena	<b>10(3)</b>
MRI	<b>9(3)</b>
Dastgheib	<b>8(2)</b>
Ghadir	<b>5(1)</b>
Rajae	<b>5 (1)</b>
Others	<b>17(4.79)</b>
<b>Total</b>	<b>355</b>

**Other hospitals include** ordibehesht 2(1%), Kosar 2(1%),Ghotbedin 1(0.3%), Beheshti 1(0.3%), Moslemin 1(0.3%),not determined 10(3%)

**Table 2: Frequency and percentage of pathogenic bacteria isolated from blood samples based on hospitals in Shiraz, 1.1.94 —31.6.94**

<b>Hospital</b>	<b>Number (%)</b>
Nemazee	<b>195(62)</b>
Amir	<b>49(16)</b>
Dastgheib	<b>16(5)</b>
Dena	<b>15(5)</b>
Hafez	<b>10(3)</b>
Others	<b>30(9)</b>
<b>Total</b>	<b>315</b>

**Other hospitals include** Qadir 5(2%), Rajae 5(2%), MRI 5(2%), Mirhoseini 2(1%), Kosar 1(0.3%), Beheshti 1(0.3%), not determined 11(3.5%)

**Table 3: The most common pathogenic bacteria isolated from blood in Bactec system in Shiraz, 1393**

Bacteria	Number (%)
<i>Staphylococcus aureus</i>	55 (15.5)
<i>Escherichia coli</i>	43 (12.11)
<i>Pseudomonase spp</i>	37 (10.42)
<i>Entrococcus spp</i>	34 (9.58)
<i>Acinetobacter baumannii</i>	30 (8.45)
<i>Stenotrophomonase maltophilia</i>	25 (7.04)
<i>Klebsiella pneumonia</i>	23 (6.48)
<i>Entrobacter spp</i>	18 (5.07)
<i>Pseudomonase aeruginosa</i>	14 (3.94)
<i>Streptococcus viridance</i>	14 (3.94)
Streptococcus pneumoniae	5 (1.41)
Others	29(16.05)

**Table 4: The most common pathogenic bacteria isolated from blood in Bactec system in Shiraz, 1.1.94 —31.6.94**

Bacteria	Number (%)
<i>Entrococcus spp</i>	46 (14.6)
<i>Pseudomonase spp</i>	44 (13.9)
<i>Acinetobacter baumannii</i>	42 (13.3)
<i>Streptococcus viridance</i>	31 (9.8)
<i>Escherichia coli</i>	30 (9.5)
<i>Stenotrophomonase maltophilia</i>	30 (9.5)
<i>Staphylococcus aureus</i>	21 (6.6)
<i>Klebsiella pneumonia</i>	19 (6)
<i>Pseudomonase aeruginosa</i>	12 (3.8)
<i>Acinetobacter lwoffii</i>	11 (3.5)
Others	29(9.5)

**Table 5: The frequency of Extended-spectrum  $\beta$ -lactamases (ESBLs) - producing bacteria isolated from blood in Bactec system in Shiraz, 1.1.94 —31.6.94**

<b>Bacteria</b>	<b>Number (%)</b>
<i>Enterobacter spp</i>	9/9 (100)
<i>Klebsiella</i>	14/20(70)
<i>Escherichia coli</i>	18/30 (60)

Extended-spectrum  $\beta$ -lactamases (ESBLs) are enzymes that mediate resistance to extended-spectrum (third generation) cephalosporins (e.g., ceftazidime, cefotaxime, and ceftriaxone) and monobactams (e.g., aztreonam) but do not affect cephamycins (e.g., cefoxitin and cefotetan) or carbapenems (e.g., meropenem or imipenem). The presence of an ESBL-producing organism in a clinical infection can result in treatment failure if one of the above classes of drugs is used.

**Table 6: Susceptibility of 34 *Enterococcus spp.* isolated from blood by Bactec system in Shiraz, 1393**

Antibiotics	Number that susceptibility tested	Percentage of Susceptibility		
		Sensitive	Intermediate	Resistance
Ceftizoxime	13	0	0	100
Cefotaxime	34	0	2.9	97.1
Cefixime	30	0	0	100
Ciprofloxacin	33	0	6.1	93.9
Oxacillin	33	0	0	72.7
Ticarcillin	3	0	0	100
Azithromycin	34	2.9	0	97.1
Clindamycin	34	2.9	0	97.1
Ceftriaxone	33	3	3	93.9
Erythromycin	33	3	0	97
Rifampin	33	3	6.1	90.9
Cefepime	32	3.1	0	96.9
Imipenem	33	9.1	6.1	84.8
Penicillin G	34	14.7	0	85.3
Ampicillin	33	21.2	0	78.8
Trimethoprim/Sulfamethoxazole	33	21.2	3	75.8
Gentamycin high dose	31	25.8	0	74.2
Doxycycline	34	29.4	2.9	67.6
Vancomycin	33	30.3	3	66.7
Teicoplanin	11	45.5	0	54.5
Linezolid	34	91.2	2.9	5.9

**Table 7: Susceptibility of 46 *Enterococcus spp.* isolated from blood by Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics	Number that susceptibility tested	Percentage of Susceptibility		
		Sensitive	Intermediate	Resistance
Oxacillin	45	0	0	100
Cefotaxime	46	0	0	100
Cefixime	9	0	0	100
Ceftriaxone	46	0	0	100
Erythromycin	46	0	2.2	97.8
Cefepime	46	0	2.2	97.8
Azithromycin	43	0	2.3	97.7
Rifampin	46	4.3	2.2	93.5
Clindamycin	44	9.1	0	90.9
Ciprofloxacin	46	0	13	87
Imipenem	46	10.9	2.2	87
Teicoplanin	39	15.4	0	84.6
Penicillin G	45	20	0	80
Ampicillin	44	18.2	4.5	77.3
Trimethoprim/Sulfamethoxazole	45	24.4	2.2	73.3
Vancomycin	46	28.3	0	71.7
Doxycycline	45	28.9	2.2	68.9
Gentamycin high dose	45	46.7	0	53.3
Linezolid	46	100	0	0

**Table 8: Susceptibility of 55 *Pseudomonas spp.* isolated from blood in Bactec system in Shiraz, 1393**

Antibiotics	Number	Percentage of Susceptibility		
		Sensitive	Intermediate	Resistance
Cefixime	42	0	7.1	92.9
Ampicillin	52	3.8	0	96.2
Cefotaxime	54	7.4	9.3	83.3
Ceftriaxone	53	7.5	1.9	90.6
Ceftizoxime	12	8.3	8.3	83.3
Tetracycline	54	11.1	11.1	77.8
Cefepime	50	24	4	72
Aztreonam	53	24.5	5.7	69.8
Trimethoprim/Sulfamethoxazole	54	25.9	9.3	64.8
Ticarcillin	54	33.3	1.9	64.8
Ciprofloxacin	50	52	16	32
Tigecycline	10	60	10	30
Imipenem	54	61.1	7.4	31.5
Colistin	53	100	0	0



**Table 9: Susceptibility of 44 *Pseudomonas spp.* isolated from blood in Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics	Number	Percentage of Susceptibility		
		Sensitive	Intermediate	Resistance
Cefixime	44	2.3	0	97.7
Ampicillin	44	2.3	0	97.7
Tetracycline	44	4.5	6.8	88.6
Ceftriaxone	44	6.8	9.1	84.1
Cefotaxime	41	9.8	9.8	80.5
Aztreonam	40	20	5	75
Cefepime	44	29.5	9.1	61.4
Trimethoprim/Sulfamethoxazole	43	39.5	7	53.5
Amikacin	44	47.7	2.3	50
Tigecycline	36	50	5.6	44.4
Ticarcillin	36	66.7	0	33.3
Pipracillin Tazobactam	44	79.5	0	20.5
Ciprofloxacin	44	54.5	27.3	18.2
Imipenem	44	81.8	0	18.2
Colistin	43	95.3	0	4.7

**Table 10: Susceptibility of 30 *Acinetobacter baumani* isolated from blood by Bactec system in Shiraz, 1393**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	30	0	0	100
Aztreonam	30	0	0	100
Cefepime	29	0	0	100
Ceftizoxime	9	0	0	100
Ceftriaxone	30	0	0	100
Cefotaxime	29	0	0	100
Cefixime	26	0	0	100
Imipenem	29	0	0	100
Ticarcillin	30	0	0	100
Tigecycline	2	0	0	100
Tetracycline	30	3.3	10	86.7
Ciprofloxacin	30	6.7	0	93.3
Trimethoprim/Sulfamethoxazole	30	6.7	6.7	86.7
Gentamicin	30	26.7	3.3	70
Colistin	29	51.7	0	0

**Table 11: Susceptibility of 42 *Acinetobacter baumani* isolated from blood by Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Cefixime	41	2.4	0	97.6
Ampicillin	42	7.1	0	92.9
Aztreonam	41	2.4	4.9	92.7
Ceftriaxone	42	7.1	2.4	90.5
Amikacin	40	10	0	90
Tetracycline	40	2.5	7.5	90
Pipracillin Tazobactam	40	2.5	7.5	90
Ciprofloxacin	41	12.2	0	87.8
Cefotaxime	41	2.4	9.8	87.8
Ticarcillin	31	12.9	0	87.1
Imipenem	42	14.3	0	85.7
Gentamicin	42	14.3	0	85.7
Cefepime	41	7.3	7.3	85.4
Tigecycline	31	16.1	0	83.9
Trimethoprim/Sulfamethoxazole	42	33.3	16.7	50
Colistin	42	97.6	0	2.4

**Table 12: Susceptibility of 14 *Streptococcus viridance* isolated from blood by Bactec system in Shiraz, 1393**

Antibiotics	Percentage of Susceptibility				%NS
	Number	Sensitive	Intermediate	Resistant	
Gentamicin	14	14.3	7.1	78.6	
Trimethoprim/Sulfamethoxazole	13	15.4	0	84.6	
Cefixime	12	16.7	8.3	75	
Ampicillin	14	21.4	35.7	42.9	
Oxacillin	14	21.4	0	78.6	
Tetracycline	7	28.6	14.3	57.1	
Ciprofloxacin	13	30.8	38.5	30.8	
Erythromycin	13	30.8	23.1	46.2	
Azithromycin	14	42.9	0	57.1	
Cefotaxime	14	42.9	35.7	21.4	
Doxycycline	13	46.2	15.4	38.5	
Penicillin G	13	46.2	53.8	0	
Ceftriaxone	14	50	28.6	21.4	
Teicoplanin	3	66.7	33.3	0	
Cefepime	14	71.4	14.3	14.3	
Clindamycin	13	84.6	0	15.4	
Imipenem	13	92.3	7.7	0	
Vancomycin	13	92.3	0	0	7.7
Linezolid	13	100	0	0	
Rifampin	14	100	0	0	

**%NS=%Non Stimulated**

**Table 13: Susceptibility of 31 *Streptococcus viridance* isolated from blood by Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Oxacillin	29	10.3	0	89.7
Cefixime	9	22.2	0	77.8
Tetracycline	15	26.7	0	73.3
Trimethoprim/Sulfamethoxazole	27	25.9	3.7	70.4
Doxycycline	29	27.6	17.2	55.2
Gentamicin	31	35.5	12.9	51.6
Erythromycin	31	29	22.6	48.4
Azithromycin	28	35.7	17.9	46.4
Clindamycin	30	53.3	3.3	43.3
Cefotaxime	31	48.4	12.9	38.7
Ceftriaxone	28	60.7	10.7	28.6
Ampicillin	29	44.8	31	24.1
Rifampin	28	85.7	0	14.3
Penicillin G	30	40	46.7	13.3
Cefepime	31	71	16.1	12.9
Vancomycin	29	93.1	0	6.9
Imipenem	31	90.3	6.5	3.2
Linezolid	30	100	0	0
Teicoplanin	9	100	0	0

**Table 14: Susceptibility of 43 *Escherchia coli* isolated from blood by Bactec system in Shiraz, 1393**

Antibiotics, (Number that susceptibility tested)	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	43	4.7	4.7	90.7
Trimethoprim/Sulfamethoxazole	42	11.9	2.4	85.7
Ticarcillin	42	11.9	0	47.6
Tetracycline	43	20.9	9.3	69.8
Ciprofloxacin	42	23.8	2.4	73.8
Cefixime	37	24.3	8.1	67.6
Cefotaxime	41	26.8	0	73.2
Ceftriaxone	43	27.9	2.3	69.8
Aztreonam	43	30.2	20.9	48.8
Cefepime	42	33.3	16.7	50
Ceftizoxime	18	66.7	0	33.3
Gentamicin	43	74.4	0	25.6
Imipenem	43	93	4.7	2.3
Colistin	43	97.7	0	2.3

**Table 15: Susceptibility of 30 *Escherchia coli* isolated from blood by Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics, (Number that susceptibility tested)	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	29	10.3	0	89.7
Ticarcillin	24	8.3	4.2	87.5
Trimethoprim/Sulfamethoxazole	29	20.7	0	79.3
Tetracycline	29	20.7	3.4	75.9
Ciprofloxacin	29	34.5	0	65.5
Cefixime	28	39.3	0	60.7
Ceftriaxone	29	44.8	3.4	51.7
Cefotaxime	29	37.9	13.8	48.3
Aztreonam	29	41.4	20.7	37.9
Cefepime	29	41.4	24.1	34.5
Gentamicin	29	72.4	0	27.6
Pipracillin Tazobactam	27	66.7	7.4	25.9
Amikacin	27	88.9	0	11.1
Imipenem	29	96.6	0	3.4
Colistin	29	100	0	0

**Table 16: Susceptibility of 25 *Stenotrophomonas maltophilia* isolated from blood by Bactec system in Shiraz, 1393**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	24	0	0	100
Aztreonam	24	0	0	100
Cefepime	23	0	8.7	91.3
Ceftizoxime	7	0	0	100
Ceftriaxone	24	0	0	100
Cefotaxime	23	0	0	100
Cefixime	22	0	0	100
Imipenem	24	0	0	100
Tetracycline	24	0	16.7	83.3
Ticarcillin	24	0	0	79.2
Gentamicin	24	20.8	4.2	75
Trimethoprim/Sulfamethoxazole	25	64	8	28
Ciprofloxacin	25	84	12	4
Colistin	23	91.3	0	8.7
Tigecycline	7	100	0	0



**Table 17: Susceptibility of 30 *Stenotrophomonas maltophilia* isolated from blood by Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Cefepime	30	0	0	100
Ceftriaxone	30	0	0	100
Cefotaxime	30	0	0	100
Imipenem	30	0	0	100
Ticarcillin	25	0	0	100
Ampicillin	30	3.3	0	96.7
Aztreonam	30	3.3	0	96.7
Cefixime	28	3.6	0	96.4
Pipracillin Tazobactam	29	17.2	20.7	62.1
Tetracyclin	30	23.3	23.3	53.3
Amikacin	30	53.3	0	46.7
Gentamicin	30	50	3.3	46.7
Ciprofloxacin	30	76.7	6.7	16.7
Trimethoprim/Sulfamethoxazole	30	86.7	6.7	6.7
Colistin	30	93.3	0	6.7
Tigecycline	27	92.6	3.7	3.7

**Table 18: Susceptibility of 55 *Staphylococcus aureus* isolated from blood by Bactec system in Shiraz, 1393**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Penicillin G	53	7.5	0	71.7
Cefixime	47	8.5	0	91.5
Cefepime	54	37	5.6	57.4
Erythromycin	55	40	9.1	50.9
Clindamycin	55	50.9	3.6	45.5
Oxacillin	55	50.9	1.8	47.3
Ciprofloxacin	52	61.5	5.8	32.7
Gentamicin	55	63.6	1.8	34.5
Trimethoprim/Sulfamethoxazole	52	75	0	25
Rifampin	54	81.5	0	18.5
Vancomycin	50	100	0	0
Linezolid	54	100	0	0

*Methicillin-resistant Staphylococcus aureus* (MRSA):

**Table 19: Susceptibility of 21 *Staphylococcus aureus* isolated from blood by Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics	Number	Percentage of Susceptibility		
		Sensitive	Intermediate	Resistance
Penicillin G	21	9.5	0	90.5
Erythromycin	21	52.4	0	47.6
Oxacillin	21	57.1	0	42.9
Cefoxitin	21	57.1	0	42.9
Cefepime	21	52.4	4.8	42.9
Clindamycin	21	61.9	0	38.1
Gentamicin	19	63.2	0	36.8
Ciprofloxacin	19	68.4	0	31.6
Rifampin	21	76.2	0	23.8
Trimethoprim/Sulfamethoxazole	19	84.2	5.3	10.5
Vancomycin	21	100	0	0
Linezolid	20	100	0	0

*Methicillin-resistant Staphylococcus aureus* (MRSA): 42.9%

**Table 20: Susceptibility of 23 *Klebsiella pneumoniae* isolated from blood by Bactec system in Shiraz, 1393**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	22	0	0	100
Ticarcillin	22	0	0	68.2
Cefotaxime	23	30.4	8.7	60.9
Cefepime	22	31.8	9.1	59.1
Trimethoprim/Sulfamethoxazole	23	34.8	0	65.2
Aztreonam	22	36.4	4.5	59.1
Cefixime	19	36.8	0	63.2
Tetracycline	23	39.1	26.1	34.8
Ceftizoxime	10	40	0	60
Ceftriaxone	22	40.9	0	59.1
Ciprofloxacin	22	63.6	4.5	31.8
Gentamicin	23	69.6	0	30.4
Imipenem	23	82.6	13	4.3
Colistin	23	95.7	0	4.3

**Table 21: Susceptibility of 19 *Klebsiella pneumoniae* isolated from blood by Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	18	0	0	100
Ticarcillin	16	12.5	0	87.5
Aztreonam	18	38.9	5.6	55.6
Cefixime	18	27.8	0	72.2
Ceftriaxone	17	35.3	0	64.7
Cefotaxime	18	38.9	0	61.1
Cefepime	18	38.9	0	61.1
Trimethoprim/Sulfamethoxazole	18	44.4	0	55.6
Ciprofloxacin	18	44.4	5.6	50
Gentamicin	18	50	0	50
Amikacin	18	44.4	11.1	44.4
Tetracycline	18	22.2	44.4	33.3
Pipracillin Tazobactam	17	52.9	17.6	29.4
Imipenem	18	83.3	5.6	11.1
Colistin	18	100	0	0

**Table 22: Susceptibility of 14 *Pseudomonas aeruginosa* isolated from blood in Bactec system in Shiraz, 1393**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	14	0	0	100
Ceftizoxime	6	0	16.7	83.3
Cefotaxime	14	0	28.6	71.4
Cefixime	13	0	0	100
Tigecycline	2	0	0	100
Ceftriaxone	14	7.1	0	92.9
Tetracycline	14	7.1	7.1	85.7
Trimethoprim/Sulfamethoxazole	14	7.1	21.4	71.4
Ticarcillin	14	28.6	7.1	64.3
Imipenem	14	50	0	50
Aztreonam	14	57.1	14.3	28.6
Cefepime	14	64.3	7.1	28.6
Ciprofloxacin	14	71.4	0	28.6
Gentamicin	14	71.4	0	28.6
Colistin	14	100	0	0

**Table 23: Susceptibility of 12*Pseudomonas aeruginosa* isolated from blood in Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	12	0	0	100
Cefixime	12	0	0	100
Tetracycline	12	0	0	100
Tigecycline	11	0	0	100
Trimethoprim/Sulfamethoxazole	11	0	9.1	90.9
Cefotaxime	11	0	27.3	72.7
Ceftriaxone	12	0	33.3	66.7
Imipenem	12	75	0	25
Ticarcillin	11	81.8	0	18.2
Gentamicin	12	91.7	0	8.3
Aztreonam	9	77.8	22.2	0
Cefepime	12	75	25	0
Ciprofloxacin	12	100	0	0
Amikacin	12	100	0	0
Pipracillin Tazobactam	12	100	0	0
Colistin	12	100	0	0

**Table 24: Susceptibility of 28 *Enterobacter spp.* isolated from blood by Bactec system in Shiraz, 1393**

Antibiotics, Number that susceptibility tested	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	18	0	0	100
Ticarcillin	18	0	11.1	22.2
Cefotaxime	18	27.8	22.2	50
Ceftizoxime	7	28.6	14.3	57.1
Cefixime	14	28.6	7.1	64.3
Tetracycline	18	33.3	11.1	55.6
Cefepime	17	41.2	11.8	47.1
Trimethoprim/Sulfamethoxazole	18	44.4	5.6	50
Aztreonam	18	50	0	50
Ceftriaxone	18	50	0	50
Gentamicin	17	70.6	0	29.4
Imipenem	18	72.2	22.2	5.6
Ciprofloxacin	17	88.2	0	11.8
Colistin	28	96.4	0	3.6



**Table 25: Susceptibility of 9 *Enterobacter spp.* isolated from blood by Bactec system in Shiraz, 1.1.94 —31.6.94**

Antibiotics, Number that susceptibility tested	Percentage of Susceptibility			
	Number	Sensitive	Intermediate	Resistance
Ampicillin	9	0	0	100
Ticarcillin	5	0	0	100
Cefotaxime	9	11.1	0	88.9
Aztreonam	9	11.1	0	88.9
Cefixime	9	0	11.1	88.9
Ceftriaxone	9	11.1	0	88.9
Cefepime	9	11.1	0	88.9
Trimethoprim/Sulfamethoxazole	9	22.2	0	77.8
Gentamicin	9	22.2	0	77.8
Tetracycline	9	0	33.3	66.7
Ciprofloxacin	9	55.6	11.1	33.3
Amikacin	9	44.4	22.2	33.3
Pipracillin Tazobactam	9	55.6	11.1	33.3
Imipenem	9	88.9	11.1	0
Colistin	9	100	0	0