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CONTAGIOUS COMMENTS
Department of Epidemiology

Bugs and Drugs: New Name, Same Rules

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NCCLS (National Committee Clinical Standards) has developed over the years as an international organization whose mission is to use a voluntary consensus process in the development of standards and guidelines for patient testing. Recognizing that the standards have become accepted and used globally, the organization changed its name in 2005 to Clinical Laboratory Standard Institute (CLSI). It's documents dictate the methodologies, controls, and breakpoints used to test antimicrobial susceptibilities of bacterial isolates. CLSI makes recommendations for the compilation of the Cumulative Antimicrobial Susceptibility Report presented in the enclosed tables.

For example, the CLSI document recommends not reporting antibiogram data for a small number (less than 10) of isolates because the data may be misleading. Please note that we have made exceptions for *Shigella sonnei* (9 isolates) and *Shigella species* (5 isolates). These were separated and antibiogram data was reported because of the difference in susceptibility rates to ampicillin and trimethoprim/sulfamethoxazole**.** Also, included in the tables are susceptibility rates of *Achromobacter xylosoxidans* and *M. morgannii* with only 9 isolates each.

In Table 1, *E. coli* susceptibility rates are reported for both urine and non-urine sites showing no differences. Significant urine isolation numbers did not occur for the other gram-negative organisms.

Clinical microbiology laboratories nationwide are isolating the *Streptococcus anginosus* group more frequently, and it is being recognized as an emerging pathogen. TCH's laboratory reported 23 isolates. This group includes three distinct species: *S. anginosus, S. imtermedius,* and *S. constellatus*. Most identification protocols report this isolate at the group level and do not speciate. The group is considered to be a part of the viridans streptococcus group and has previously been reported as *S. milleri*. *S. anginosus* group has a strong association with abscess formation and most of TCH's isolates were from brain and neck abscesses.

While a wide range of antibiotic treatments are available to treat *S. anginosus* group and there is little drug resistance, surgical drainage is a necessary adjunct to antibiotic treatment. The viridans streptococcus group, however, contains many species that continue to show increased resistance. Penicillin resistance has increased with only 29% susceptible, and cefotaxime shows a susceptibility rate of 63% in 2005 compared to a 93% rate in 2004.

In contrast, *S. pneumoniae* isolates from invasive sites appear to be more susceptible to both penicillin and cefotaxime. This was also reflected in a November 2005 report from the Colorado Department of Health that noted high level penicillin resistance among invasive *S. pneumoniae* has decreased 65% since 2001 in the Metro-Denver area. The number of invasive *S. pneumoniae*

TABLE 1. Antimicrobial Susceptibilities at TCH - 2005 Gram Negative Organisms (% susceptible)

ORGANISMS	NUMBER OF ISOLATES	ANTIMICROBIALS: Ampicillin / Amoxicillin (IV/PO)	Cefazolin / cephalexin (IV/PO)	Cefuroxime / cefaclor (IV/PO)	Cefotaxime/ ceftriaxone (IV)	Gentamicin (IV)	Tobramycin (IV)	Trimethoprim / sulfa (IV/PO)	Ciprofloxacin [2] (IV/PO)
Haemophilus species [1]	41	10			100			76	
Citro. amalonaticus	12	0	0	25	100	100	100	100	100
Citrobacter freundii	23	30	0	78	83	83	100	80	87
E. coli (urine)	752	48	94	98	99	98	98	67	97
E. coli (non-urine)	65	57	94	95	98	97	97	75	92
Enterobacter cloacae	36	11	8	42	78	100	100	94	100
Klebsiella pneumoniae	76	R	87	92	97	100	100	82	100
Klebsiella oxytoca	18	R	50	89	89	100	94	100	100
M. morganii	9	0	0	0	100	89	89	67	89
Proteus mirabilis	39	85	85	92	92	92	100	92	92
Salmonella species	26	92			100			96	
Serratia marcescens	32	0	0	0	81	97	94	100	88
Shigella sonnei	9	89			100			22	
Shigella species	5	20			100			40	

Testing by Microscan panels (except Haemophilus by E-test)
[1] May include more than 1 isolate / patient.
[2] The fluoroquinolone class is generally not FDA approved for use in children less than 18 yrs.
Three Isolates identified as ESBL. R = Resistant (Intrinsic)

TABLE 2. Antimicrobial Susceptibilities at TCH – 2005 Non-Enterobacteriaceae (% susceptible)

ORGANISMS	NUMBER OF ISOLATES	ANTIMICROBIALS: Ticarcillin/clav Timentin (IV)	Piperacillin (IV)	Ceftazidime (IV)	Cefipime (IV)	Aztreonam (IV)	Imipenem / Cilastatin (IV)	Ciprofloxacin [2] (IV)	Gentamicin (IV)	Tobramycin (IV)	Meropenem	Piperacillin / Taz	Minocycline	Trimeth / Sulfa
Acinetobacter baumannii / hae	13	77	85	85	77		100	92	85	92	100			
Pseudomonas aeruginosa	103	88	91	91	84	79	94	91	83	97	94	95		
• CF-mucoid [1]	114	62		79		79	72	59		65	81			
• CF-nonmucoid [1]	124	38		70		69	68	56		60	74			
A. xylosoxidans [1]	9	56					67	45			56	78	56	67

[1] Cystic fibrosis isolates by E-test. May include more than 1 isolate/patient.
[2] Not FDA approved for use in children less than 18 yrs.
Other testing by Microscan panels.

TABLE 3. Antimicrobial Susceptibilities at TCH – 2005 Staphylococcus (% susceptible)

ORGANISMS	NUMBER OF ISOLATES	ANTIMICROBIALS: Penicillin (IV/PO)	Oxa-/ Nat-/ Dicloxacillin (IV/PO)	Cefazolin / Cephalexin (IV/PO)	Trimethoprim / Sulfa (IV/PO)	Erythromycin (IV/PO)	Clindamycin (IV/PO)	Vancomycin (IV)
Staph aureus								
• *Staph aureus* (MSSA)	222	14	100	100	99	71	80	100
• *Staph aureus* (MRSA)	192	R	R	R	98	8	62	100
Coag negative staph								
• *Staph hominis/hominis*	28	18	54	54	54	33		100
• *Stpah epidermidis*	161	2	24	24	60	26		100

Testing by Microscan panels – Confirmation of MRSA by PbP2a [1] testing.

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isolates at TCH has remained the same for the last two years, with a decrease in the isolation rate in respiratory sites. Respiratory isolates, however, remain multiply antibiotic resistant.

If clindamycin is selected to treat a staphylococcus or a group A streptococcus, a supplementary test called the "D"-test must be performed to detect the *erm* gene that codes for inducible resistance to clindamycin. This testing is performed on all *Staphylococcus aureus* and group A streptococcus isolates before clindamycin susceptibility is reported. Clindamycin data for coagulase-negative staphylococci is not available because the laboratory policy is not to perform the "D"-test automatically and we have had no requests.

No Vancomycin-resistant *Enterococcus spp.* were isolated in 2005. Three ESBL isolates were isolated in 2005 which has remained constant for the past two years.

TABLE 4. Antimicrobial Susceptibilities at TCH – 2005
Candida albicans (# of isolates susceptible)

ORGANISMS	NUMBER OF ISOLATES	ANTIMICROBIALS					
		Fluconazole			Flucytosine		
		S ≤ 8	I = 16 - 32	R ≥ 64	S ≤ 4.0	I = 8 - 16	R ≥ 32
Candida albicans	10	10			2[1]		

Testing by UTHSC (at San Antonio).
[1] Only 2 isolates tested.

TABLE 5. Antimicrobial Susceptibilities at TCH – 2005
Streptococcus (% susceptible)

ORGANISMS	NUMBER OF ISOLATES	ANTIMICROBIALS											
		Penicillin			Cefotaxime			Erythromycin	Clindamycin	Trimethoprim/ Sulfa	Cefotaxime	Ampicillin / Amoxicillin (IV/PO)	Vancomycin (IV)
		S ≤ 0.06	I = 0.12-1	R ≥ 2	S ≤ 0.5	I = 1	R ≥ 2						
S. pneumoniae Invasive	19	100			100			88	76	100			100
		S ≤ 0.06	I = 0.12-1	R ≥ 2	S ≤ 1.0	I = 2	R = ≥ 4						
S. pneumoniae Localized (resp.)	59	54	31	15	90	7	3	68	68	63			100
		S ≤ 0.05-12	I = 0.25-2	R ≥ 4									
Viridan Strep Invasive	38	29	39	32				39	95		63		100
Strep. anginosus Group Invasive	23	96	4					96	96		100		
Testing by E-test.													
Enterococcus faecalis	67											100	100
Enterococcus faecium	23											78	100

Testing by Microscan panel.
Gentamicin Synergy Screen–*E. faecalis* = 92
Gentamicin Synergy Screen – *E. faecium* = 100
No Vancomycin Resistant Enterococcus isolated.