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Performance of the Prompt System in Identification and Antimicrobial Susceptibility Testing of Clinical Isolates

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The rapid 3M Prompt inoculation system was compared with the traditional log-phase system for Autoscan identification and antibiotic susceptibility testing (MIC) of 188 recent clinical isolates. The two systems were equally effective for gram-negative rods; the Prompt system was slightly superior for the determination of MICs for gram-positive organisms.

Agar cultures of bacterial stock strains may be successfully prepared with the 3M Prompt inoculation system (Prompt; Minnesota Mining & Manufacturing Co., St. Paul, Minn.) for antimicrobial susceptibility testing with the Kirby-Bauer diffusion technique or the MIC dilution method (1, 3–5). Prompt is useful to clinical microbiologists because it saves time by eliminating the preparation of a log-phase culture and subsequent adjustment of a specific density. The Prompt inoculation wand picks up a remarkably constant number of viable bacterial cells (three to four) (4, 5) which are dispersed in a supplied diluent and immediately provides a suitable suspension for antibiotic testing.

TABLE 1. Percent discrepancies in MICs for 188 clinical isolates tested by the Prompt system and log-phase cultures[a]

Organism (no. tested)	Discrepancy (%) in MIC of: Ampicillin	Penicillin G	Cephalothin	Tetracycline	Gentamicin	Chloramphen	Trimethoprim methoxazole	Nitrofurantoi	Carbenicillin	Cefoxitin	Cefoperazone	Cefotaxime	Moxalactam	Piperacillin	Tobramycin	Amikacin	Nalidixic acic	Vancomycin	Nafcillin	Erythromycir	Clindamycin
Escherichia coli (48)					L 2					L 2	P 2			P 2		PL 44					
Klebsiella pneumoniae (17)									P 12	P 12						P 6					
Proteus mirabilis (12)											P 8			P 8							
Pseudomonas aeruginosa (23)					P 4																
Staphylococcus aureus (25)	P 28	P 28	P 4			L 4												P 16			
Enterococci (21)	P 5		PL 55																		
All others (42)	P 5	P 2	P 5	P 5	P 2		P 2		P 2		P 2					P 2					P 2

[a] A blank indicates that MIC readings with both systems agreed within 1 dilution of antibiotics; L, log-phase cultures gave a fourfold or higher MIC than Prompt cultures; P, Prompt cultures gave a fourfold or higher MIC than L cultures; numbers indicate percent discrepancies; PL, in some cultures P > L, in others, P < L.

The purpose of the present study was to evaluate the performance of Prompt for both identification and antimicrobial susceptibility testing in a clinical setting. We were particularly interested in working with colonies taken directly from primary selective plates (eosin-methylene blue and cysteine-nalidixic acid), since that would further facilitate the technique. Accordingly, colonies (no more than 24 h old) of 188 significant clinical isolates were sampled from primary plates with the Prompt wand system and transferred to the Prompt nutritional medium, as previously described (1, 4). Gram-negative *Enterobacteriaceae* and nonfermenters were seeded on microdilution trays (panels) for bacterial identification and MIC determination (MicroScan Systems, Hillsdale, N.J.), and gram-positive aerobic cocci were examined on panels for antibiotic testing only. For control purposes, portions of the colonies used for the inoculation of Prompt were transferred to tryptic soy broth (Difco Laboratories, Detroit, Mich.), incubated for 2 to 4 h at 35°C, diluted with saline to McFarland standard 0.5, further diluted 1:125 in inoculum (MicroScan) without Tween 80, and seeded on panels as described above. All plates were covered, incubated overnight at 35°C, and then read on an Autoscan III (MicroScan).

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TABLE 2. MICs of selected antibiotics to 12 β-lactamase-positive strains of *S. aureus* with discrepant Prompt and log readings

Susceptibility to methicillin[a]	Culture no.	MIC of penicillin (μg/ml)[b] by:		MIC of ampicillin (μg/ml)[c] by:	
		Prompt	Log	Prompt	Log
Resistant	34	>4	>4	64	2
Susceptible	1	>4	4	>64	2
	6	4	0.25	1	0.5
	2	4	1	64	1
	5	>4	4	64	2
	32	>4	>4	64	8
	33	>4	1	64	0.5
	56	4	1	1	1
	58	2	0.5	1	1
	50	>4	1	2	1
	57	>4	2	64	1
	53	>4	>4	>64	4

[a] Susceptible: growth in wells with ≤2 μg/ml; resistant: growth in wells with ≥4 μg/ml.
[b] Susceptible: growth in wells with ≤0.12 μg/ml; resistant: growth in wells with ≥0.25 μg/ml.
[c] Susceptible: growth in wells with ≤0.25 μg/ml; resistant: growth in wells with ≥0.5 μg/ml.

All wells inoculated with Prompt suspension gave clear-cut results that were easy to read. Without exception, biotypes observed by Prompt were identical to those read by the conventional log-phase suspension.

On the whole, very similar MIC results were obtained with both methods (Table 1). A notable exception, which was similar to the observation by Barry et al. (2), was the MIC of penicillin and ampicillin for *Staphylococcus aureus*; in 28% of the cases, it was significantly higher when measured by Prompt. Details of this are given in Table 2, which shows that β-lactamase-positive strains of *S. aureus* gave the same or higher MIC readings in Prompt than in the log system. Both systems showed that all 12 strains listed in Table 2 were resistant to penicillin and ampicillin. It must therefore be recognized that when the MIC is in the border area, discrepancies in interpretation may occur, and in that case it appears that Prompt predicts the sensitivity pattern to *S. aureus* more accurately than the log system. *S. aureus* β-lactamase-negative strains were not encountered.

In conclusion, identification and MIC determination for antibiotics by Prompt is at least as reliable as and sometimes superior to the conventional log-phase system. In addition, it offers considerable time-saving qualities.

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