

EASTERN SYDNEY AREA HEALTH SERVICE

Eastern Sydney Area Health Service,
Cnr. High & Avoca Streets,
Randwick. N.S.W. 2031.

SMB/VAE

18th June, 1991.

Dear Colleague,

C.D.S. USERS GROUP

Please find enclosed the second newsletter which contains some major changes to the C.D.S. method. Should you have any comments or questions concerning these changes please contact us on (02) 399-4053 or (02) 399-4054.

Barrie Gatus, Jeanette Pham, Alex Jimenez and I will be conducting the C.D.S. Users Group Workshop at the A.S.M. Meeting at the Gold Coast on Wednesday, July 3, 1991, at 2.00 p.m. We hope to have an interesting and stimulating programme for the group and we will report on this meeting in the next newsletter.

Kind regards.

Yours sincerely,

S. M. BELL.

C.D.S. USERS GROUP NEWSLETTER

As foreshadowed in the previous newsletter of 22/11/90 we have completed the calibration of benzylpenicillin 0.5 units with Gram-positive cocci and methicillin 5 µg with staphylococci. The reduction in the disc potencies for these antibiotics was a consequence of an increase over time of the zone sizes of the control strains with the previously used disc potencies. This was probably due to the improvement in manufacturing technique and packaging of individual 6mm discs which resulted in discs of more consistent and stable potency than the Multodiscs used in the earlier calibrations. We have also added two other antibiotics, cephalexin and cefaclor, to the antibiotic list for use in the specific circumstances outlined below. In the modified table which follows all newly calibrated antibiotics are underlined and described in more detail. Gentamicin has also been restored to the Gram-positive list at the request of several users and in response to other requests, polymyxin (colistin) was put back in the pseudomonas antibiotic group. The second table in this newsletter contains the calibration of appropriate antibiotics against some important but rarely tested pathogens.

These changes and other aspects of the CDS method will be discussed at our workshop at the Gold Coast ASM meeting on Wednesday 3/7/91 at 2 pm. We look forward to seeing those who can make it to the meeting then.

Benzylpenicillin 0.5 units:

The penicillin disc content for testing Gram-positive cocci is now **0.5 u** which enables a much more effective discrimination between susceptible and β-lactamase producing strains of *Staphylococcus aureus*. Also with the penicillin **0.5 u** potency disc, those strains of *Streptococcus pneumoniae*, *Strep. bovis* II, *Strep. mitis* and *Strep. sanguis* which are relatively resistant to penicillin (MIC ≥ 0.25 mg/l) now give zones clearly less than 6 mm.

Methicillin 5 µg:

The use of the methicillin 5 µg enables the distinction between methicillin-susceptible and methicillin-resistant strains of staphylococci to be made with a greater degree of confidence than was possible with the 10 µg disc. In particular, heteroresistance to methicillin in staphylococci is more easily detected using the 5 µg methicillin disc because the resistant colonies which appear in the zone of inhibition with these strains are more obvious.

Cephalexin for urinary tract infections:

A cephalexin 100 µg disc can be used for testing the susceptibility of *Escherichia coli*, *Klebsiella* species and *Proteus mirabilis* **FOR URINARY INFECTIONS ONLY**. Organisms which possess the Class I chromosomal β-lactamase such as *Enterobacter cloacae*, *Citrobacter freundii*, *Serratia marcescens*, *Morganella morganii*, *Providencia* spp. and Indole-positive *Proteus* spp. should be considered **RESISTANT** to cephalexin and **SHOULD NOT BE TESTED**. The MIC of cephalexin of susceptible strains is ≤ 16 mg/l which yield zones with annular radii ≥ 6 mm.

Cefaclor and *Haemophilus influenzae*:

Cefaclor is calibrated only for unencapsulated strains of *H. influenzae* associated with respiratory tract infections.

Handling of antibiotic discs:

Despite the improved packaging of antibiotic discs, the lower potency of penicillin and methicillin discs makes it **IMPERATIVE TO STORE AND HANDLE THE DISCS CORRECTLY**.

Store all stock discs at -20°C.

Store the "in use" discs in an air-tight container at 4°C with a desiccant which must be renewed at regular intervals.

The container with discs must be kept closed for 30 min at room temperature after removal from the refrigerator. This will prevent condensation forming on the discs as this will inactivate some antibiotics.

DO NOT USED EXPIRED DISCS. Regularly check all in-use disc cartridges for expiry date.

**Antibiotic disc content, MIC of susceptible, mean annular radius, standard deviation
and 95% confidence limits with the reference strains used in the C.D.S. Method**

Antibiotic and Disc content (µg)	MIC of susceptible strains (mg/l)	Mean annular radius ± standard deviation (mm)	Acceptable range (mm) (95% confidence limits)
<u><i>Staphylococcus aureus</i> NCTC 6571</u>			
Benzylpenicillin	(0.5 u) ≤ 0.06	12.3 ± 0.7	10.9 - 13.7
Chloramphenicol	(30) ≤ 8.0	9.7 ± 1.0	7.7 - 11.7
Ciprofloxacin	(2.5) ≤ 1.0	11.0 ± 0.9	9.2 - 12.8
Erythromycin	(5) ≤ 0.5	9.3 ± 0.9	7.5 - 11.1
Fusidic acid	(2.5) ≤ 0.5	10.0 ± 1.0	8.0 - 12.0
Gentamicin	(10) ≤ 1.0	8.4 ± 0.5	7.4 - 9.4
Kanamycin	(50) ≤ 4.0	7.3 ± 0.7	5.9 - 8.7
Methicillin	(5) ≤ 4.0	9.2 ± 0.7	7.8 - 10.6
Nitrofurantoin	(200) ≤ 32.0	8.7 ± 0.9	6.9 - 10.5
Rifampicin	(1) ≤ 0.5	10.5 ± 1.0	8.5 - 12.5
Sulphafurazole	(300) ≤ 64.0	12.3 ± 1.3	9.7 - 14.9
Tetracycline	(30) ≤ 2.0	13.2 ± 1.4	10.4 - 16.0
Trimethoprim	(2.5) ≤ 2.0	7.3 ± 0.6	6.1 - 8.5
Vancomycin	(60) ≤ 2.0	6.1 ± 0.7	4.7 - 7.5
<u><i>Escherichia coli</i> NCTC 10418</u>			
Amikacin	(30) ≤ 4.0	9.1 ± 1.0	7.1 - 11.1
Ampicillin	(25) ≤ 8.0	9.2 ± 0.7	7.8 - 10.6
Aztreonam	(10) ≤ 4.0	13.0 ± 0.6	11.8 - 14.2
Cefotaxime	(5) ≤ 1.0	11.8 ± 0.9	10.0 - 13.6
Cefotetan	(10) ≤ 4.0	12.6 ± 0.5	11.6 - 13.6
Cefoxitin	(30) ≤ 8.0	11.2 ± 1.2	8.8 - 13.6
Ceftazidime	(10) ≤ 4.0	10.4 ± 0.6	9.2 - 11.6
Ceftriaxone	(5) ≤ 2.0	12.9 ± 0.7	10.5 - 14.3
Cephalexin	(100) ≤ 16.0	8.6 ± 0.5	7.6 - 9.6
Chloramphenicol	(30) ≤ 8.0	9.4 ± 1.0	7.4 - 11.4
Ciprofloxacin	(2.5) ≤ 1.0	13.4 ± 0.9	11.6 - 15.2
Gentamicin	(10) ≤ 1.0	8.9 ± 0.9	7.1 - 10.7
Imipenem	(10) ≤ 4.0	12.5 ± 0.8	10.9 - 14.1
Kanamycin	(50) ≤ 8.0	9.0 ± 1.4	6.2 - 11.8
Nalidixic acid	(30) ≤ 4.0	10.5 ± 0.8	8.9 - 12.1
Netilmicin	(30) ≤ 2.0	10.0 ± 0.5	9.0 - 11.0
Nitrofurantoin	(200) ≤ 32.0	7.7 ± 0.8	6.1 - 9.3
Norfloxacin	(10) ≤ 4.0	14.1 ± 1.2	11.7 - 16.5
Sulphafurazole	(300) ≤ 64.0	7.9 ± 1.1	5.7 - 10.1
Tetracycline	(30) ≤ 4.0	8.2 ± 0.9	6.4 - 10.0
Tobramycin	(10) ≤ 1.0	7.4 ± 0.5	6.4 - 8.4
Trimethoprim	(2.5) ≤ 2.0	8.6 ± 0.9	6.8 - 10.4
<u><i>Escherichia coli</i> NCTC 11560</u>			
Augmentin	(60) ≤ 8.0/4.0	7.7 ± 0.7	6.3 - 9.1
Timentin	(85) ≤ 32.0/2.0	7.2 ± 0.5	6.2 - 8.2
<u><i>Pseudomonas aeruginosa</i> NCTC 10662</u>			
Amikacin	(30) ≤ 16.0	9.1 ± 0.9	7.3 - 10.9
Aztreonam	(30) ≤ 8.0	9.7 ± 0.8	8.1 - 11.3
Ceftazidime	(10) ≤ 4.0	9.8 ± 1.2	7.4 - 12.2
Ciprofloxacin	(2.5) ≤ 2.0	11.4 ± 1.3	8.8 - 14.0
Gentamicin	(10) ≤ 4.0	7.9 ± 0.8	6.3 - 9.5
Imipenem	(10) ≤ 4.0	8.7 ± 0.7	7.3 - 10.1
Netilmicin	(30) ≤ 8.0	8.3 ± 0.9	6.5 - 10.1
Piperacillin	(50) ≤ 16.0	10.2 ± 1.2	7.8 - 12.6
Polymyxin	(300 u) ≤ 1.0	6.2 ± 0.5	5.2 - 7.2
Ticarcillin	(75) ≤ 32.0	9.5 ± 1.1	7.3 - 11.7
Tobramycin	(10) ≤ 4.0	8.5 ± 0.6	7.3 - 9.7
<u><i>Haemophilus influenzae</i> NCTC 4560</u>			
Ampicillin	(2) ≤ 1.0	7.6 ± 0.8	6.0 - 9.2
Chloramphenicol	(10) ≤ 2.0	9.3 ± 0.8	7.7 - 10.9
Cefaclor	(30) ≤ 4.0	9.1 ± 0.9	7.3 - 10.9
Cefotaxime	(5) ≤ 0.12	11.5 ± 1.3	8.0 - 14.1

N.B: Items in bold type are new calibrations..

Additional Calibrations:

Antibiotic disc content and MIC of susceptible strains for infrequently tested bacterial species.

Antibiotic and disc content	(μg)	MIC of susceptible strains (mg/l)
<i>Acinetobacter species</i>		
Amikacin	(30)	≤ 4.0
Ampicillin	(25)	≤ 8.0
Ciprofloxacin	(2.5)	≤ 1.0
Gentamicin	(10)	≤ 1.0
Imipenem	(10)	≤ 4.0
Netilmicin	(30)	≤ 2.0
Norfloxacin	(10)	≤ 4.0
Sulphafurazole	(300)	≤ 64.0
Ticarcillin	(75)	≤ 32.0
Tobramycin	(10)	≤ 1.0
<i>Enterococcus species</i>		
Ampicillin	(25)	≤ 8.0
Gentamicin ¹	(200)*	-
<i>Yersinia enterocolitica</i> ²		
Amikacin	(30)	≤ 4.0
Augmentin ³	(3)*	$\leq 2.0/1.0$
Aztreonam	(10)	≤ 4.0
Chloramphenicol	(30)	≤ 8.0
Ciprofloxacin	(2.5)	≤ 1.0
Gentamicin	(10)	≤ 1.0
Imipenem	(10)	≤ 4.0
Netilmicin	(30)	≤ 2.0
Sulphafurazole	(300)	≤ 64.0
Tetracycline	(30)	≤ 4.0
Timentin	(85)	$\leq 32.0/2.0$
Tobramycin	(10)	≤ 1.0
Trimethoprim	(2.5)	≤ 2.0
<i>Xanthomonas maltophilia</i> ⁴		
Sulphafurazole	(300)	≤ 64.0

* Note the difference in disc potency to that used with other species in the CDS method

1. Enterococci and high level resistance to gentamicin:

Enterococci with a gentamicin MIC $\leq 1,024$ mg/l are considered to be highly resistant to this agent. These strains give NO zone of inhibition using a gentamicin 200 μg content disc whereas strains not demonstrating high level resistance give zones ≥ 4 mm.

This test is performed on those strains associated with infective endocarditis; high level resistance to gentamicin generally indicates that there is unlikely to be synergy between gentamicin and the β -lactams.

2. Yersinia enterocolitica:

Yersinia enterocolitica must be tested on **SENSITEST AGAR** at **30°C**.

Yersinia enterocolitica is uniformly **RESISTANT** to all penicillins except Augmentin and Timentin. Of the β -lactam antibiotics only Augmentin, Timentin, aztreonam and imipenem need to be tested.

3. Yersinia enterocolitica and Augmentin:

The disc potency of Augmentin is 3 μg and differs from the potency used for other species.

If strains are **SUSCEPTIBLE** to Augmentin, they are **SUSCEPTIBLE** to cephalosporins.

If strains are **RESISTANT** to Augmentin, they are **RESISTANT** to cephalosporins.

4. Xanthomonas maltophilia:

Strains of *Xanthomonas maltophilia* are resistant to **ALL** aminoglycosides, **ALL** β -lactams and **ALL** quinolones. Although with each of these antibiotics strains may appear to be "susceptible" on preliminary testing, mutation to resistance at a high frequency is characteristic of this species. Sulphafurazole is the only antibiotic which is calibrated.

