

Table Comparison of Enzyme immunoassay, immunofluorescence, and cell culture for specimens from 66 patients (31 men, 35 women)

Enzyme immunoassay	Immunofluorescence	Cell Culture	Total*
—	—	—	51 (27)
+	+	+	5 (3)
+	+	—	9 (4)
—	+	+	1 (1)

\*Figures in parentheses represent women only.

technique. This is almost certainly the case. Towards the end of our reported study we noticed a decrease in the sensitivity of our cell culture technique. The study was therefore extended, and discrepant results between cell culture and enzyme immunoassay were re-examined using a direct immunofluorescence technique (Micro Trak Syva). Overall, 277 specimens were examined by cell cultures and enzyme immunoassay, comprising 158 cervical specimens and 119 male urethral specimens. Sensitivity and specificity for enzyme immunoassay were 81.25% and 95.2% for cervical specimens, respectively, and 95.3% and 97.5% for urethral specimens, respectively.

There were 22 discordant results: 13 were culture negative and enzyme immunoassay positive and nine culture positive and enzyme immunoassay negative. Of these, 10 specimens (nine enzyme immunoassay positive and culture negative) were available for immunofluorescence testing. In addition, five specimens positive by enzyme immunoassay and culture and 51 randomly selected specimens negative by both methods were retested using immunofluorescence.

Immunofluorescence testing was carried out by placing an aliquot of the remaining enzyme immunoassay specimen (held for a variable period at  $-70^{\circ}\text{C}$ ) on a 10 mm well of a teflon coated slide. After fixation in cold acetone for 30 minutes the preparation was stained according to the manufacturer's instructions (Micro Trak Syva).

The Table shows the results. All nine culture negative and enzyme immunoassay positive specimens and the single enzyme immunoassay negative culture positive specimen were immunofluorescence positive. Immunofluorescence results on the 56 non-discordant specimens agreed with the cell culture and enzyme immunoassay findings. Thus when checked against immunofluorescence only one enzyme immunoassay result was truly false (negative). Incorporating these results into our calculations the sensitivity and specificity improve from 81.25% to 83.3% and 95.2% to

98.4%, respectively, for cervical specimens and from 91.9% to 92.9% and 91.5% to 97.4% for urethral specimens, respectively.

Taylor-Robinson, Hawkins, and Thomas,<sup>1</sup> cautioned against misinterpreting immunofluorescence test results that produce apparent high identification rates for *C trachomatis*. As enzyme immunoassay methods are not subjective this should be less of a problem with these techniques. Sensitivity and specificity with enzyme immunoassay will, however, reflect the optical density cut off setting, and some results will fall in the "retest range."

It is well accepted that cell culture, even in the best hands, is not 100% successful; but until more extensive experience is obtained with the new methods, epidemiological and treatment studies based solely on antigen detection techniques must be interpreted with caution.

#### Reference

- <sup>1</sup> Taylor-Robinson D, Hawkins DA, Thomas BJ. Syva Micro Trak stains: their use in a routine laboratory. *J Clin Pathol* 1983;**38**:237.

GL RIDGWAY  
JD ORIEL  
G MUMTAZ  
B MELLARS

Department of Clinical Microbiology,  
University College Hospital,  
Grafton Way,  
London WC1E 6AV

#### Influence of laboratory sensitivity reporting on antibiotic prescribing preferences of general practitioners in the Leeds area

A survey made over two periods of time was used to determine the effect of a limited antibiotic reporting policy on the prescribing habits of general practitioners in the Leeds area.

During the autumn of 1983 a policy of limited antibiotic reporting was adopted by the senior medical staff of the microbiology department of Leeds General Infirmary. This policy called for the laboratory to suggest the use of single agents that were considered to be less toxic, less expensive, or less likely to cause bacterial antibiotic resistance, for the treatment of inpatient, outpatient, and general practitioner patients, from whom a significant isolate had been obtained. A laboratory report for a patient with uncomplicated urinary tract infection would normally indicate the susceptibility of the isolate to trimethoprim, sulphonamides, and nitrofurantoin. Alternative antibiotics would be reported if indicated by the clinical condition of the patient. For this scheme to be effective full clinical details of the patient are required by the laboratory. Completed laboratory reports therefore carried comments indicating to the clinician the importance of clearly stating the patient's condition, the duration of illness, length of pregnancy if applicable, and any recent or current treatment with antibiotics, whether or not prescribed for urinary tract infection. Antibiotics prescribed for other conditions may be excreted in adequate quantities in the urine to preclude the isolation of a clinically important organism, although urinary tract infection itself may persist.

Hospital clinicians normally respond to advice given by the laboratory on the use of antibiotics; there is, however, some doubt about the influence of the laboratory on the prescribing patterns of general practitioners. To determine the influence of the limited antibiotic reporting policy on the prescribing habits of general practitioners a survey was carried out by the laboratory shortly after the policy was introduced and repeated twelve months later. The survey entailed asking general practitioners for their preferred antibiotic for use in the treatment of urinary tract infection; a laboratory method monitored incoming urines for content and subsequent identification of antimicrobial substances.<sup>1</sup>

In the winter of 1983-4 a questionnaire was issued to 149 general practitioners within the western Leeds area to whom the Infirmary laboratory is responsible for the handling of specimens. Twelve months later the questionnaire was reissued and the responses compared. The questionnaire described six circumstances in which a general practitioner might find him or herself dealing with a patient presenting with symptoms of urinary tract infection. Each question asked the general practitioner to indicate his choice of antibiotic. The content

Table 1 Percentage response by general practitioners for each antibiotic for 1983-84 and 1984-85

Question and year of Survey	Antibiotic prescribed						
	Co-trimoxazole	Trimethoprim	Ampicillin	Amoxycillin	Nitrofurantoin	Cephalosporin	Other
1a 83/4	27.3	42.0	9.1	4.5	8.0	1.1	8.0
84/5	4.17	73.6	2.78	4.17	6.94	1.39	6.94
1b 83/4	36.4	42.0	0	0	9.1	1.1	11.4
84/5	6.94	75.0	0	0	9.72	4.17	4.17
1c 83/4	1.1	5.7	27.3	20.4	23.9	5.7	15.9
84/5	0	16.9	18.3	23.9	23.9	8.45	8.45
2 83/4	2.35	3.5	41.2	27.1	17.6	3.5	4.71
84/5	0	5.63	38.0	31.0	15.5	5.63	4.22
3 83/4	28.7	29.9	12.6	9.2	12.6	3.45	3.34
84/5	12.9	51.4	7.14	7.14	10.0	5.71	5.71
4 83/4	22.6	28.6	1.2	1.2	2.4	2.4	15.5
84/5	11.8	50.0	2.94	0	27.9	0	7.35

of the questionnaire was as follows:

1 20 year old female patient with cystitis who has:

- no known allergies
- allergy to the penicillins
- allergy to septrin.

2 20 year old pregnant patient with cystitis.

3 Catheterised patient in whom you suspect that symptoms of fever and malaise are related to urinary tract infection.

4 A patient presents with a history of repeated urinary tract infection and you decide to use antibiotics prophylactically.

Table 1 shows the responses to the questionnaire.

About 20% of urines from patients seen by a general practitioner contain antimicrobial substances on arrival in the laboratory.<sup>1-4</sup> Using a method developed in this laboratory, the identity of antibiotics present in the urine was ascertained. Although it is appreciated that some of these urines may have contained antibiotics as a result of patients using antibiotics prescribed for earlier or unrelated conditions,<sup>5</sup> we nevertheless felt that the specimens would provide a useful guide to the antibiotics currently in use. Table 2 shows the results of the laboratory tests.

The response to the questionnaire circulated at the beginning of the survey suggested that 50.7% of the local general practitioners were already using antibiotics as recommended by the laboratory. Forty four per cent of urines were found to contain antibiotics consistent with the reporting policy by the identification test. Twelve months

later the results of the questionnaire and the identification test were 68%, and 67%, respectively.

Although there is currently a national trend away from the use of co-trimoxazole towards trimethoprim alone,<sup>6</sup> which may account for some of the decline in the use of co-trimoxazole as indicated by both questionnaire and laboratory test, we feel that these results support the hypothesis that reporting a limited range of antimicrobial agents did and continues to influence the prescribing habits of general practitioners in the Leeds area.

#### References

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P LANGDALE

MR MILLAR

Department of Microbiology,  
University of Leeds,  
Leeds  
LS2 9JT

#### Lymphocyte recovery rate using H6000

We note the comments of Markey *et al* on our findings and would like to point out that our lymphocyte recovery rate is based on the absolute lymphocyte count of recovered cells, using the H6000. This instrument differentiates lymphocytes from monocytes by peroxidase staining, and a low monocyte count does not, therefore, lead to an over-estimation of lymphocyte recovery. LUC denotes large unstained cells—that is, primitive "blast" cells—and activated lymphocytes. The increase in LUC, after separation of these cells, as monocytes, which are peroxidase positive, do not appear in the LUC fraction.

Preliminary studies of cytopsin preparations of cells recovered by our modified "buffy coat" method, using Leishmann and non-specific esterase staining techniques suggest that a monocyte contamination of around 16% results, tending to confirm the H6000 results. We would suggest that our relatively low monocyte contamination is due to adherence of these cells to plastic ware during separation procedures.

The modified buffy coat method has improved our lymphocyte yields, and the cells recovered survive and respond well to mitogens such as Pokeweed in tissue culture. Viability at the end of two weeks in continuous culture is 60% or more.

LA KAY  
DE LOCKE

Department of Haematology,  
The Royal Infirmary,  
New Durham Road,  
Sunderland, SR2 7JE.

Table 2 Percentage of total urine specimens containing antibiotics for 1983-4 and 1984-5

	Trimethoprim	Co-trimoxazole	Ampicillin	Amoxicillin	Cephalosporin	Sulph	Others
1983/4	17.7	28.8	10.3	0.7	5.2	11.1	26.2
1984/5	57.0	2.8	2.8	9.9	7.1	0.0	20.4