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# LETTERS TO THE EDITOR

## Control and prevention of tuberculosis in the UK

I welcome the updated code of practice compiled by the Joint Tuberculosis Committee of the British Thoracic Society (December 1994;49:1193–200) and I appreciate the enormity of the task involved in producing this succinct report. Inevitably, not every problem could be addressed in the recommendations presented, so I would like to draw attention to the following issues.

It is stated and commonly accepted that patients with smear positive pulmonary disease and fully sensitive organisms become non-infectious after two weeks of treatment with drugs including rifampicin and isoniazid and remain so if regular, adequate chemotherapy is continued, even though bacilli may be seen in sputum smears. This assumes that the bacillary response to treatment is so good that only a few organisms remain on smear and that these are no longer viable – that is, they do not grow on culture. My experience has shown that this is not always the case; some patients, albeit compliant, have a much slower bacillary response; repeated sputum examination continues to reveal large numbers of bacilli on smear and a corresponding number of colonies on culture long after the "statutory" two weeks on treatment. Such patients should still be regarded as potentially infectious and their sputum must continue to be monitored. To allow a patient with, for example, extensive pulmonary disease with large numbers of bacilli on sputum smear to return to work, which involves close contact with infants and young children, would be courting disaster.

In health care workers with strongly positive tuberculin reactions (grades 3 and 4 Heaf tests) I strongly endorse the recommendation that chest radiography be undertaken when the individual concerned comes from a country where tuberculosis is common. I would, however, recommend that this directive should also apply to young persons from the indigenous community living in an area where the incidence of tuberculosis is high. By the same token, if a young prospective employee, who comes from an area in the UK where tuberculosis is virtually unknown, is unexpectedly found to be a strongly positive tuberculin reactor, chest radiography should also be considered.

With regard to contact tracing procedures, neighbours in closeknit communities must be considered as possible close contacts and relevant enquiries made. Children play in each other's homes and not uncommonly run errands for elderly neighbours. In the course of many years of experience with tuberculosis contacts it was not uncommon to pick up cases of childhood tuberculosis amongst neighbours of source cases.

In the paragraph on examination of contacts I was puzzled by the following sentence: "If retesting is not practicable, BCG vaccination should be given after the first negative Heaf test; chemoprophylaxis may also be given in children under five years of age." This is a dangerous piece of advice as it stands because it is not accompanied by any warning that the individuals may have been given vaccination in the pre-allergic phase of infection when it is likely that they will develop very unpleasant abscesses at the site of vaccination. In such circumstances they should be seen again urgently when a repeat Heaf test will show evidence of conversion to a strongly positive reaction (Heaf grades 3 or 4) – bearing in mind that in a non-infected person BCG commonly confers only low hypersensitivity, Heaf grades 1 or 2 – and a course of chemoprophylaxis should then be started.[1,2] I find it hard to see why retesting cannot be practicable except that, for example, it may have to be postponed for a few weeks on account of a common viral infection or a holiday.

Continuing with the examination of close contacts of pulmonary tuberculosis, the legend below the flow diagram of figure 2 indicates with an asterisk the important warning "Negative test in immunosuppressed subjects does not exclude tuberculosis." It is a pity that this problem was not addressed further in the text as it may not be instantly obvious that a patient may be immunosuppressed as a result of HIV infection. This inevitably brings in the contentious issue of HIV testing which should be discussed in this context.

With regard to follow up of close contacts, it must be remembered that tuberculosis is a silent disease in the early stages and by the time the patient presents with symptoms the disease is generally well entrenched and the patient is then likely to be infectious. As one of the objectives of contact examination is to prevent this occurring, it would be well worth following up all close contacts irrespective of previous BCG vaccination which, it must be remembered, is only 75–80% effective.

I strongly disagree with the advice concerning tuberculosis in schools that "no action is required in child contacts who have good documentary or scar evidence of previous BCG vaccination". I recommend that such children should be tuberculin tested as a strongly positive response would indicate evidence of superinfection with *M tuberculosis*; this is of particular importance in areas where the incidence of tuberculosis is high. For the same reasons I disagree with the advice concerning tuberculin testing in the schools' BCG programme. In the case of strongly positive reactors, irrespective of previous BCG status, all should receive chemoprophylaxis and close family contacts should be screened as recommended in the 1990 guidelines.[3]

Finally, a strong recommendation should have been made that physicians in the speciality of sexually transmitted diseases should liaise closely with colleagues who are in charge of tuberculosis contact screening in the event of dual diagnosis in the index case.

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1 Festenstein F. Spread of tuberculosis within a family. *Lancet* 1981;i:603–5.
2 Caplin M. *The tuberculin test in clinical practice*. London: Baillière Tindall, 1980.
3 Subcommittee of the Joint Tuberculosis Committee of the British Thoracic Society. Control and prevention of tuberculosis in Britain: an updated code of practice. *BMJ* 1990;300:995–9.

AUTHOR'S REPLY On behalf of the Joint Tuberculosis Committee (JTC) I thank Dr Festenstein for her encouraging introductory remarks and wish to comment on each of the issues she raises.

The recommendation that two weeks' standard chemotherapy renders smear positive patients (with fully sensitive organisms) non-infectious is nothing new. It was in the 1983 and 1990 versions of the Code. No evidence has come to light to suggest that this policy is unsound, whereas there is reassuring evidence to suggest that the bacillary response to treatment is equally good in HIV positive and negative tuberculosis patients.[1]

With regard to health care workers, Dr Festenstein suggests that we should retain the pre-employment chest radiograph in strong Heaf reactors, not only in those from high risk countries but also for those in the indigenous population, both in high and low risk areas. In short, she wishes to retain the recommendations in the 1990 guidelines. Interestingly, when these recommendations were made, Dr Festenstein thought the JTC had gone too far.[2] My view then,[3] as now, is that we must heed the evidence where it exists and seek it when it is absent. Evidence since 1990 (quoted in the present Code) supports the view that, in general, pre-employment radiography can be confined to those with symptoms.

As far as contact tracing is concerned, I agree that neighbours may sometimes be close contacts and should therefore, in these circumstances, be screened. As to the policy for initially tuberculin negative contacts of infectious cases, we agree that retesting is best, followed by BCG vaccination only in those who remain tuberculin negative. However, where retesting is not practicable, the JTC considers that it is better to vaccinate after the first negative tuberculin test than not to vaccinate at all. I do not agree that this recommendation is dangerous. Firstly, it is in line with current (and past) Department of Health guidelines[4] and I am not aware that this has presented significant problems in practice. Secondly, most initially tuberculin negative contacts will not, in fact, be infected, having been in contact with the source case for long enough to develop a positive skin test if they are going to, so that the chances of an adverse reaction with BCG is much less than is the case when BCG vaccination is given to subjects known to be tuberculin positive. I agree, however, with the suggested course of action should a severe BCG reaction occur.

We make it clear in the text that HIV infection is considered only in relation to protection of NHS staff, and that other aspects (including the issues raised by Dr Festenstein) are covered in a recent publication from the JTC. However, the various aspects might usefully be combined and included in the next update of the Code of Practice.

In the section on contact tracing we do recommend radiographic follow up at three and 12 months, irrespective of previous BCG vaccination, in contacts with strongly positive Heaf tests who have been in contact with smear positive disease.

When infectious tuberculosis is diagnosed in a school, many of the child contacts may be more casual than close, and those most at risk are those unprotected by BCG vaccination. It is therefore reasonable to confine tuberculin testing to children who have not had BCG vaccination, but to be prepared to spread the net if the initial trawl suggests

a highly infectious source case. Should all strongly positive tuberculin reactors in the schools' BCG vaccination programme receive chemoprophylaxis as Dr Festenstein suggests? We believe that chemoprophylaxis should be offered only to high risk groups – that is, those with a recent contact history or residents in a high prevalence area within the previous two years. The reason for this is that the predictive value of a positive tuberculin test (for true tuberculous infection) is low in populations with a low incidence of infection (such as schoolchildren) as compared with, say, contacts of tuberculosis or entrants from high risk countries. Thus, if the Heaf test has 95% sensitivity and 98% specificity, the predictive value of a positive test is only 32% in a population having 1% incidence of tuberculous infection. In such a population, therefore, two out of every three subjects receiving chemoprophylaxis (for a positive tuberculin test) will not, in fact, have tuberculous infection. For similar reasons the routine screening of domestic contacts of tuberculin positive schoolchildren is unproductive.

I strongly agree with Dr Festenstein that physicians specialising in sexually transmitted diseases should liaise closely with colleagues in charge of tuberculosis contact tracing in the event of dual diagnosis (HIV and tuberculosis) in the index case to ensure that all cases of tuberculosis are notified and that the possibility of HIV positivity in contacts can be borne in mind.

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1 Brindle RJ, Nunn PP, Githui W, Allen BW, Gathua S, Waiyaki P. Quantitative bacillary response to treatment in HIV-associated pulmonary tuberculosis. *Am Rev Respir Dis* 1993; **147**:958–61.
2 Festenstein F, Empey DW, Rudd RM. Tuberculosis in Britain. *BMJ* 1990;**300**:1339.
3 Skinner C. Tuberculosis in Britain. *BMJ* 1990; **300**:1724.
4 Departments of Health, Joint Committee on Vaccination and Immunisation. *Immunisation against infectious disease*. London: HMSO, 1992.

## Non-invasive mechanical ventilation in acute respiratory failure

Ambrosino and colleagues (July 1995;**50**: 755–7) report their experience of using non-invasive positive pressure ventilation in 59 episodes of acute respiratory failure in 47 patients with chronic obstructive pulmonary disease (COPD). In this study, non-invasive ventilation was unsuccessful in those patients who were most acidotic at presentation. However, the degree of acidosis developed during an exacerbation is a major feature in determining survival in patients with COPD.[1] It is these patients, often with frequent admissions and for whom invasive ventilation on the intensive care unit is inappropriate, who are most in need of ventilatory assistance. In addition, the overall mortality rate of 8·5% in this study, despite the use of non-invasive ventilation in all cases, is comparable with some other studies using conventional treatment alone.[1,2]

Non-invasive ventilation has attracted much enthusiastic support, but there still appears to be insufficient evidence of the benefits offered by this technique to support its widespread use. A randomised controlled trial in comparison with conventional therapy (including doxapram) is still needed.

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1 Jeffrey AA, Warren PM, Flenley DC. Acute hypercapnic respiratory failure in patients with chronic obstructive lung disease: risk factors and use of guidelines for management. *Thorax* 1992;**47**:34–40.
2 Martin TR, Lewis SW, Albert RK. The prognosis of patients with chronic obstructive pulmonary disease after hospitalisation for acute respiratory failure. *Chest* 1982;**82**:310–4.

# BOOK NOTICE

**Interfacing the IBM-PC to Medical Equipment**. RWD Nickalls and R Ramasubramanian. (Pp 402; £37·50 (US$ 59·95)). Cambridge: Cambridge University Press, 1995. 0 521 46280 0.

This book "represents an attempt to bring together both details of serial communications as they relate to an IBM-compatible PC, and the problems associated with interfacing specific items of equipment". To achieve this, the authors have divided this 400 page book into three sections: I – The serial interface, II – Miscellaneous topics, and III – The equipment. There are nine appendices.

Part I provides an outline to the RS-232 standard, how to transmit data, controlling the flow of data, the communication ports on the PC, and how to program in QuickBasic. Whilst this section explains in reasonable detail the important concepts of linking the medical equipment to PC computers, it is rather heavy going and the more general reader will probably skip most of the technical jargon and simply pick out the important bits of information. However, you will be able to communicate in interface-speak.

Part II provides a very brief overview of running Kermit – a communication software program. There are better texts and overviews of this elsewhere. The electrical safety section is also brief, but does permit the non-electronics expert to comprehend the "dos" and "don'ts" of interfacing electrical equipment to the patient. The data analysis section is short and provides some useful, but rather limited information. This could be much more comprehensive and consequently more helpful.

Part III should be the most useful. Interfacing four makes of pulse oximeter (Ohmeda 3700/3740, Nellcor, Novametrix and Minolta Pulsox-7), Datex anaesthetic monitors, two syringe pumps, two ventilators (Ohmeda 7800 and Drager Evita) and the Vitalograph Compact II spirometer are all covered. Each section covers communication modes, the ports available, the cable connections, programs for data collection in real-time or from memory output. Some of this information is provided in the user/maintenance manuals and some of the software is commercially available. Only one system has an example of the type of output. It would have been more useful to have included examples of data analysis and possible outputs available, which is what the end user actually wants. Each chapter is comprehensive and, with some knowledge, the programs could be installed and tested by a user with some experience of programming and debugging. I do have some reservations as to why some equipment needs to be interfaced to a computer.

Overall, this book provides an "attempt" at bringing together much information that is available in numerous other texts, some of which are easier for the less knowledgeable reader. Clearly by trying to bring all of this information together the authors have been constrained by space and cost at providing a more comprehensive overview of the problems, the programs, and their outputs. A paperback edition would have been cheaper and would perhaps have permitted more information to be given for the same price. It is to be hoped that the second edition is an improvement. Doubtless this book will find a place in some medical physics/bioengineering reference libraries. – AHK.

# NOTICE

## Scadding-Morriston Davies Joint Fellowship in Respiratory Medicine 1996

This fellowship is available to support visits to medical centres in the UK or abroad for the purpose of undertaking studies related to respiratory medicine. Medical graduates practising in the UK, including consultants and irrespective of the number of years in that grade, may apply. Applicants should submit a curriculum vitae together with a detailed account of the duration and nature of the work, the centres to be visited, confirming that these have agreed to provide the facilities required, and giving the sum of money needed for travel and subsistence (there is no application form). A sum of up to £12 000 can be awarded to the successful applicant, or the sum may be divided to support two or more applications. Applications should be sent by **31 January 1996** to Dr I A Campbell, Secretary to the Scadding-Morriston Davies Fellowship, Llandough Hospital, Penarth, South Glamorgan CF64 2XX.

# CORRECTION

## Review of prescription of domiciliary long term oxygen therapy in Scotland

In the paper entitled "Review of prescription of domiciliary long term oxygen therapy in Scotland" by D Morrison *et al* which appeared on pages 1103–5 of the October issue, line 10 of the second column on page 1104 should read "However, **51%** of these measurements were performed when the patients were clinically unstable . . ."