

# Laboratory medicine in primary health care

**A**LTHOUGH simple laboratory tests have been performed in primary health care for many years, recent technological developments have made it possible to do a much wider range of tests nearer the patient ('near patient testing').<sup>1-3</sup> Many of these tests require little equipment and a non-technical person such as a nurse can often obtain a result within a few minutes. In the United States at least 20% of all laboratory tests are now done in doctors' offices.<sup>4</sup> The proportion is probably smaller in most European countries, but the growing importance of primary care, together with economic and social factors, will inevitably lead to an increase. There are also a few tests which can be done by the patient. Some of these can be purchased 'over the counter', but others (such as blood glucose meters used by diabetics) are becoming important for patient management. At the same time the use of the hospital laboratory by general practitioners is being influenced by new methods of communication technology, such as computer linkages which allow rapid transmission of results and two-way access to information.

At a time of rapid change, a recent conference report<sup>5</sup> provides a salutary reminder that both laboratories and doctors in primary care will need to modify their methods of working to make the best use of these new opportunities and avoid some of the pitfalls. Access to laboratory tests is no longer a major problem: the fundamental question is not whether it is possible to do the test, but whether it is worth doing and, if so, where it should be done and who will pay for it. As in all branches of medicine, the need for cost-effectiveness is paramount.

At present the requirements for laboratory medicine in primary health care are ill-defined, but they differ in many respects from those of hospital medicine. The nature of the clinical problem, the prevalence of disease, and the need for urgent testing are different. In primary care there are increasing demands for laboratory tests in occupational health, preventive medicine and health educational programmes. There are wide variations in the numbers and types of laboratory tests requested by general practitioners.<sup>6</sup> The reasons for these differences, and their impact on patient care, need investigation. More data are needed to provide a baseline for assessing the effect of introducing new technologies and working practices.

## *Advantages and disadvantages of near patient testing*

Some of these new technologies are already well-established in primary health care: for example, pregnancy tests, blood glucose meters for monitoring diabetics, and tests for use in opportunistic screening, such as blood cholesterol measurements. However, the glamour associated with some new technologies, and commercial pressures for their wider use, create problems. Doctors need better information about the capabilities, advantages and disadvantages of near patient testing. The main benefits are claimed to be that it saves time and is more convenient for both the patient and the doctor, and that the test may earn a fee.<sup>7</sup> The patient's compliance is likely to be improved if the test is done and treatment or advice given in a single visit. However, several reports have shown that the analytical quality of tests performed outside the laboratory is often poor.<sup>4,8</sup> In some cases this seems to be due to the poor technique of the operator, inadequate training, and the lack of quality assurance procedures.<sup>9</sup> As a result, many laboratory workers are reluctant to encourage near patient testing because they believe that the results are inferior to those which they can provide. When tests are done in primary health care the doctor must take responsibility for the quality of the result, even if one of his staff per-

forms the test. Responsibilities must therefore be clearly defined, and the implications — legal, social as well as clinical — understood by all concerned.<sup>10</sup> All staff who perform the test must be trained and mandatory routines for quality assurance applied.<sup>9,11</sup> In selecting equipment, the doctor may lack the knowledge and experience to distinguish a good instrument from a poor one, or even to realize that there are important differences, and that no technique is foolproof. He therefore needs help, and must be encouraged to seek this from laboratories before he starts testing, and not later when he runs into problems.<sup>9</sup> Laboratory staff are more likely to collaborate if they are involved at an early stage. They can help by evaluating the suitability of new tests and equipment for use in primary care, paying particular attention to the degree of skill required and the environment in which the test is performed. In addition they should advise on the selection of equipment, help with training, and supervise quality assurance procedures. It is essential that the results of office tests do not conflict with those obtained by the laboratory. As an additional safeguard, it is useful to consider the award of certificates of competence to operators who have demonstrated that their results are reliable. This would give everyone confidence in the procedures used.

## *Selection of appropriate tests*

As new technologies develop, the range of tests which can be done in general practice is constantly increasing, and the article by Hilton in this issue (p.32) draws attention to some of those now available in the UK. Whether these are worth doing is a different question. Wherever tests are performed, doctors in primary health care need advice on how to make the best use of laboratory medicine, including:

- the selection of appropriate tests for a given clinical situation;
- where these tests should best be done, and the cost;
- preparation of the patient and collection of the specimen;
- safety precautions (for example in a case of suspected hepatitis or acquired immune deficiency syndrome);
- when the result will be available;
- interpretation, including reference values (which may be different from those of hospitalized patients);
- the need for confirmatory or supplementary testing (for example monitoring), and where this should be done.

## *The need for collaboration*

Educational programmes and refresher courses on these topics should be organized by staff in laboratory medicine and supplemented by handbooks and newsletters on how to make the best use of the local laboratory. At present it is difficult to identify which tests would be most effective in general practice because there is little information about what testing is done now. There is an obvious danger that testing will proliferate as it becomes easier to do, particularly when its unit cost appears to be small. However, cheap tests done in large numbers cost a lot of money. The best approach to these problems might be the preparation of local guidelines jointly by laboratories and general practitioners. These should include information about the effectiveness of the tests in terms of the clinical actions taken and the outcome. These should be followed up by continuing and regular monitoring and audit of test usage, in which everyone should be encouraged to participate. This collaboration should include advice on which tests can (and which should not) be done in primary health care and which should be sent to the

central laboratory. There is considerable scope for research on the most cost-effective ways of providing laboratory services to primary health care: for example, tests could be done in larger health centres at predetermined times, by a visiting member of a local laboratory (or even by a peripatetic laboratory) who could also replenish reagents and quality control materials which may be unstable, used infrequently, and relatively expensive. The choice between these and other alternatives will depend on many practical factors, which will change with time. The best blend between them will only be found through local discussion and agreement.

Much greater effort needs to be made to involve laboratory staff working in hospitals, who are often unaware of the needs and problems of primary health care and who need education about these. They should be encouraged to visit primary health care centres where they can see the problems at first hand and can help with training and quality assurance. Although they are familiar with quality assurance techniques used in laboratories, they may not appreciate the difficulties which practitioners have in applying these to office testing, or some of the wider aspects of quality assurance. For example, laboratories rarely have the information about outcome which could be used to assess the effectiveness of the tests they do.

Although the proposals made in the World Health Organization report<sup>5</sup> seem practical and sensible, incentives are needed to improve the effectiveness of laboratory medicine in primary health care. Reimbursement policies can be used to influence the quality, and sometimes quantity, of analytical work. For example, reimbursement can be made conditional on participation (and satisfactory performance) in approved quality control programmes. However, this would have little influence on the appropriateness and effective use of tests. For these, the best incentives are professional accountability, peer review, the intellectual pride and curiosity of health care professionals, and social pressures. All of these need nurturing and encouragement to make them effective. Communication and collaboration must be improved at all levels — local, national and international. Every country is now facing similar problems of cost-effectiveness of laboratory medicine, and regular exchange of information would enable everyone to learn from the mistakes and successes of others.

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