

provide the pathway so clearly needed for nurses who want to follow a clinical career, but the work must be recognized as carrying at least equal status and equal pay to administration. Such was certainly the intention of Mr Brian Salmon himself: he had no doubt, he told the conference, that highly trained clinical nurses should stay on the ward and be properly rewarded for doing so.

<sup>1</sup> *Report of the Committee of Inquiry into the Pay and Related Conditions of Service of Nurses and Midwives*. London, H.M.S.O., 1974.

<sup>2</sup> *Report of the Committee on Senior Nursing Staff Structure*, (Chairman Mr. Brian Salmon). London, H.M.S.O., 1966.

## Getting it Right

Two aspects of modern medical practice have given added impetus to current studies of clinical decision-making and its consequences. One is the growing awareness that while demand for medical care is open-ended the resources for its provision are finite, so that those who provide such care should make the best possible use of these limited resources. Second is the development (painfully, incompletely, and belatedly) of a "new" mathematical framework with which to handle the problems which arise in applying decision-theory to medical practice. These aspects, in fact, are closely linked and practical solutions could help a sorely pressed Health Service<sup>1</sup>—a feature that made last week's conference on "The doctor as a clinical decision-maker" at the Royal College of Physicians particularly timely.

In the past many of the difficulties in this area have been the fault of the theorists themselves; for, while the medical profession has an enviable reputation in adopting new methods and techniques, the individual doctor must see some relevance in a new system if he is to support it whole-heartedly. Sad to say, many of the early efforts in medical decision-making either ignored medical facts and opinions or were so wildly impractical that they in turn were ignored by the medical profession altogether. Indeed, enormous harm has already been done in the biological sciences by individuals (largely computer-oriented) promising the moon and failing to deliver anything of substance at all.

More recently, however, application of information science and decision-making theory seems to have reached the stage where (at last) some practical benefit to the patient is emerging. To take a few examples which were presented at the conference, research at the Liver Unit at King's College Hospital has redefined the role of laboratory tests in jaundice; Jennett's studies in Glasgow<sup>2</sup> have provided the clinician with a much clearer picture on which to base his decisions after head injury; the Leeds system<sup>3</sup> appears significantly to improve the quality of clinicians' decision-making in diagnosis of the acute abdomen; and, most recently of all, Emerson *et al.*<sup>4</sup> have applied decision-theory to the problem of deep-vein thrombosis after myocardial infarction.

This last report presents an elegant and topical study in decision-making. Death from pulmonary embolism after myocardial infarction can be prevented by prophylactic therapy—but this therapy itself may result in death from bleeding due to the administration of the drug. What Emerson *et al.* have done is to evaluate the situation using decision-theory and they then drew up a set of treatment allocation rules (based on such simple attributes as the patient's age and smoking habits). Moreover, in a prospective validation these rules have shown how to cut the death rate from pulmonary embolism or its treatment by about one-third.

Quite clearly, in all of these areas a great deal more work remains to be done in order to assess more fully the nature and extent of any possible benefits and to determine which systems can achieve these benefits most simply and cheaply. Equally clearly the role of mathematics will vary from application to application. Once the initial calculations have been carried out, Emerson and his colleagues have produced a system which can be followed by anyone using the back of an envelope. In other situations, such as the Leeds system, some form of computer assistance seems necessary, though at Leeds reformulation of the system made it suitable for an extremely small desk-top computer.<sup>5</sup>

So for the first time the theory of information science and decision-making is beginning to show some practical benefit in clinical medicine. The role which this new discipline will have in the future is far from certain at this stage; but as special investigations and complex treatments become more and more expensive in terms of time and money it may well be many traditional values and practices will need a fresh re-examination. For that to happen, however, the new mathematicians will have to become very down to earth, and its practitioners will have to develop an empathy with the medical profession which has not always existed in the past. To that end, the recent series of practical studies and the R.C.P. conference are to be welcomed.

<sup>1</sup> *British Medical Journal*, 1974, 4, 272, 327, 389.

<sup>2</sup> Jennett, B., Teather, D., and Bennie, Susan, *Lancet*, 1973, 2, 652.

<sup>3</sup> de Dombal, F. T., *et al.*, *British Medical Journal*, 1974, 1, 376.

<sup>4</sup> Emerson, P. A., Teather, D., and Handley, A. J., *Quarterly Journal of Medicine*, 1974, 43, 389.

<sup>5</sup> Horrocks, Jane C., *Methods of Information in Medicine*, 1974, 13, 83.

## Allergy to Corticosteroids

Apparently any drug can cause allergic or idiosyncratic reactions in man. Corticosteroids are often used in treating these complications, so it is perhaps surprising that they themselves may provoke anaphylactic responses. But Mendelson *et al.*<sup>1</sup> have recently reported the case of a young asthmatic who rapidly developed urticaria, angioneurotic oedema, and increased bronchospasm after intravenous injection of methylprednisolone or hydrocortisone.

The drugs had been prescribed in proprietary preparations (Solu-Medrone and Solu-Cortef) so that much careful detective work had to be done before the culprits could be identified. Solu-Medrone contains methylprednisolone sodium succinate in a diluent which contains many preservatives including methylparaben and propylparaben, which are known skin-sensitizing agents.<sup>2,3</sup> Intradermal skin tests using Solu-Medrone or Solu-Cortef gave negative results up to 48 hours, so it was decided to test the effect on the patient of Solu-Medrone under supervision in hospital. Initially 4 mg of the preparation was injected intravenously, and the patient experienced no untoward symptoms during the subsequent hour. However when 40 mg of the drug was given intravenously he developed urticaria, angioneurotic oedema, and severe bronchospasm. An intravenous test-dose with the diluent alone caused no untoward reaction. To evaluate the effect of sodium succinate 40 mg of plain methylprednisolone was given orally, and thirty minutes later he developed the reaction as before.

Later, tests with 40 mg of prednisone or prednisolone and 6 mg of dexamethasone produced no abnormal symptoms. The intradermal skin tests were repeated using methylprednisolone and hydrocortisone tablets or powder with