

see if eventually there will be a break in the slopes of the actuarial plots of the treated and control populations suggesting that there is a subpopulation in whom the regimen has eliminated residual tumour. Equally many will watch these women to see if the long-term administration of alkylating agents may be carcinogenic: it is known that women with breast cancer carry an increased risk of a second cancer, especially in the other breast and in the bowel.

Ideally we should now be trying to differentiate the women with tumours likely to be associated with early metastases from those who have a high probability of cure or a very long interval of disease-free life. This means finding new factors to differentiate the subsets in the grey zone of women with between 0 and 3 affected lymph nodes—surely an area in which British medical science, with careful clinical observation and an advanced tumour marker programme, should be capable of making contributions. Such an approach needs to be started soon—before the waters are muddied by a tide of uncontrolled prophylactic chemotherapy in poorly staged patients, which could carry the risk of inducing drug resistance or even premature death.

¹ *Lancet*, 1976, 1, 1116.

² Fisher, B, *et al*, *New England Journal of Medicine*, 1975, 292, 117.

³ Bonnadonna, G, *et al*, *New England Journal of Medicine*, 1976, 294, 405.

⁴ Canellos, G P, *et al*, *Annals of Internal Medicine*, 1976, 84, 389.

Additives to intravenous fluids

Drugs need to be given intravenously when a rapid action is required, as in inducing anaesthesia or controlling convulsions and cardiac arrhythmias; when absorption from the gut is poor or the drug would be inactivated before reaching the systemic circulation; and some drugs, blood, and blood products can be given only into the blood stream. Recently, however, the ready availability and ease of use of disposable cannulae and stainless steel butterfly needles have encouraged doctors to take advantage of the intravenous route merely for convenience, especially in severely ill patients. Drugs given directly into the systemic circulation are distributed in high concentration to organs with a rich blood supply, and they may produce hypotension and cardiac or respiratory arrest if administered too quickly. Fear of such an occurrence has led to diluting drugs by mixing them with intravenous infusion fluids, but growing concern about the hazards associated with this practice prompted the setting up of a working party by the DHSS, and its report¹ has now been published.

The report identifies some of the technical problems which may arise when drugs are added to intravenous fluids. Blood and solutions containing amino-acids or lipids may be degraded by the additive. Incomplete mixing may be a hazard. It may be difficult to achieve a constant rate of administration with conventional giving sets: heparin is probably best given in small volumes of normal saline with a motorised infusion pump. When antibiotics must be given parenterally intramuscular administration is often preferable to the intravenous route, but if the latter is positively indicated penicillins, aminoglycosides, and cephalosporins should normally be given intermittently. Continuous intravenous infusion is indicated only for antibiotics which are too toxic or irritant to be given

intermittently—for example, tetracyclines and fucidic acid. This method is also best for potassium chloride, a drug which must be well diluted and given slowly. Intravenous infusion is also indicated when a constant therapeutic effect is required—for example, control of cardiac arrhythmias with lignocaine or induction of labour with oxytocin. Whenever possible the addition of drugs should be made in hospital pharmacies rather than on the ward, to reduce the risk of microbial contamination.

The report also deals with the medicolegal implications of adding drugs to intravenous fluids, the responsibilities of medical and nursing staff, and documentation. The responsibility for examining and improving existing standards of practice has been left to individual districts; this is a suitable task for a drug and therapeutics committee. Documents should be designed specifically for the prescribing of intravenous fluids and additives. These should provide a complete record of intravenous therapy and be retained as part of the patient's permanent medical record. The use of the fluid balance chart for prescribing and recording of intravenous therapy is no longer acceptable, as it is frequently discarded once the patient has been discharged. Finally, since there are several techniques for giving drugs intravenously, doctors must ensure that their instructions are understood by the nursing staff. Nurses who hold a statutory qualification can be responsible for the addition and administration of certain drugs by intravenous infusion, but there is a need for education and training in such techniques.

¹ DHSS, *Addition of Drugs to Intravenous Fluids*, Health Circular HC(76)9, London, DHSS.

Pets and exercise in childhood asthma

Parents of an asthmatic child often ask their doctors whether the family pet ought to be removed or if it would be wise to acquire a new one. Studying 118 unselected asthmatic children, Sarsfield *et al*¹ found that over half had regular contact with a pet or a known sensitivity to a particular pet with or without regular contact. Contact with a pet was often associated with a positive skin test reaction. In general, however, only if the skin test reaction was large (a weal diameter on prick testing greater than 4 mm) or there was a clear-cut history of symptoms on contact was specific IgE found in the serum—a finding which usually implies clinical sensitivity.² If the sensitised child avoided contact with the offending pet, specific IgE production then waned to undetectable levels.

The interpretation of serum specific IgE levels to animal allergens has obvious clinical importance. Sarsfield *et al* warned that the removal of a pet may cause family unhappiness, with adverse effects on the asthma; such a decision should not be made solely on a small skin reaction. Nevertheless, they said, occult pet sensitivity should always be considered, especially when indicated by a large skin test reaction. They advised against families with asthmatic children acquiring any new pet animals, particularly dogs, cats, rabbits, and rodents.

That exercise may provoke wheezing is well recognised,³ though it may often be reduced by the prophylactic sodium cromoglycate.⁴ Often, however, an asthmatic child's participation in sport is restricted. Swimming is less likely to provoke