

sources include saline,¹¹ soap and antiseptic solutions,¹² eyedrops,¹³ creams,¹⁴ jellies,¹⁵ and equipment which contains standing water or retains moisture (especially respirators and resuscitation equipment for premature infants),¹⁵⁻¹⁷ moist brushes (for example, shaving-brushes used for depilation of the scalp before craniotomy),¹⁸ and surgical instruments and catheters "sterilized" with an inadequate disinfectant.^{19 20} Dry sources (dust, air) are uncommon but may on occasion be important.²¹ The hands of nurses in wards where the infection occurs are often found to carry *Ps. aeruginosa* and are likely to contaminate uninfected patients if the nurses do not wear rubber or plastic gloves when attending to them.²² The importance of some sites which are commonly contaminated—for example, sinks and drains—has not been clearly established.

At page 313 of the *B.M.J.* this week Dr. J. E. Tinne, Dr. A. M. Gordon, Mr. W. H. Bain, and Mr. W. A. Mackey report an outbreak of infection of the respiratory tract with *Ps. aeruginosa* in a cardiac surgery unit. During two months, in which 30 operations were performed, five patients became infected with this organism and three of them died. These deaths occurred in the eight patients of the series who had open heart surgery followed by tracheostomy, hydrocortisone therapy, broad-spectrum antibiotics, and prolonged mechanical ventilation. All strains were of the infrequent pyocine type 10. A strain of the same type was found in the connecting tube of a respiratory ventilator and in a rebreathing bag. These findings strongly suggest that infection was acquired by the patient's respiratory tract from the ventilator. The authors subsequently found *Ps. aeruginosa* on various fittings and pieces of equipment in the operating-theatre suite, and introduced measures to prevent recurrences. These included the use of a new disinfectant, which appeared to be effective in removing *Ps. aeruginosa* from contaminated objects and sites.

Though outbreaks of *Ps. aeruginosa* infection continue to be reported, they are often due to some deficiency or error in technique (especially in sterilization or maintenance of sterility) which can be corrected. But outstanding difficulties still exist with types of equipment—for example, mechanical ventilators—that cannot be sterilized by heat, and also with the elaborate nursing procedures of intensive-care units. The design of some types of equipment needs improvement to facilitate cleaning and disinfection. In the treatment of burns the control of *Ps. aeruginosa* infection has been greatly helped by local application of 0.5% silver nitrate solution,^{23 24} and this can probably be enhanced by modern aseptic methods, notably the use of "isolators"²⁴—that is, special isolation chambers. Two new antibiotics, gentamicin^{25 26} and carbenicillin,²⁷⁻²⁹ give promise of providing better control of *Ps. aeruginosa* infection than has been obtained with the polymyxins, and immunological methods of protection have also shown promise.^{30 31} For the protection of high-risk patients it is desirable to use these and other methods in a system of multiple defences. But no set of rules can succeed without a high standard of aseptic discipline and understanding among the hospital staff under the guidance of an active infection-control officer.

Body Building by Drugs

The self-administration of anabolic steroids is becoming a problem in athletics. A letter from Dr. D. E. Pearsons at page 353 draws attention to the matter. Taking these artificial aids to athletic performance must surely be condemned as unethical. In addition, it is possibly hazardous to health, for this group of drugs have side-effects.

Those anabolic steroids that are active when taken by mouth commonly affect conventional liver-function tests and occasionally cause jaundice. These side-effects are probably caused by interference with the transport of conjugated compounds into the bile and usually disappear quickly on withdrawal of the drug. Serum enzyme levels of the transaminases S.G.O.T. and S.G.P.T. and lactic dehydrogenase are often raised, though this does not necessarily imply damage to liver cells. Only the compounds active by mouth cause liver damage, because of their particular chemical configuration. They may also raise the level of serum lipids, especially of cholesterol, with the possibility of causing serious harm in that way. This action has been specially noted in two groups of patients—those receiving glucocorticoids and obese diabetics not requiring insulin.¹ Some anabolic steroids may impair the hepatic degradation of cortisol, enhancing the action of this drug and necessitating a reduction in dosage.^{2 3}

All anabolic steroids so far investigated have proved to have some androgenic activity. In women this may lead to hirsuties, acne, and virilization of the voice.⁴ The patient feels her voice to be strange and is unsure about its use; in severe cases it wavers between the chest and falsetto registers. This effect is irreversible.

Increased muscular development and improved athletic performance are widely believed to result from use of anabolic

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steroids,⁵ and there is good evidence that they do increase the muscle mass in castrates of both sexes and in most patients with a high rate of protein catabolism, but critical studies confirming these effects in normal men on an optimal protein and calorie intake are lacking. In a carefully controlled trial W. M. Fowler and colleagues⁶ failed to find any effect of an anabolic steroid on the physical performance of young healthy men, even in a group taking extra physical exercise along with the drug. It might be argued that the physical exercise used in this study was not severe enough to compare with that undertaken by athletes preparing for international competition. If that were so it is possible that anabolic steroids combined with a high-protein diet might have an anticatabolic effect under conditions of severe muscular exercise, and hence produce an increase in physical performance.

It is difficult to detect whether a patient is taking these preparations, because the doses used might be small, and in any case adequate methods for detecting these drugs and their metabolites in blood and urine have not been fully evaluated. Since any effect they may have on muscular development will be prolonged, athletes can stop taking the drugs several weeks before a competition, so that any chance of detection then would be negligible. Secondary effects of the anabolic steroids on serum enzyme levels or on the level of thyroxine-binding globulin,⁷ with lowering of the plasma protein-bound iodine, might be more prolonged, but further studies are required to clarify their duration. It is to be hoped that all the governing bodies of sports will take a stand against the use of such methods of training.

Mismanagement of Non-disease

Some two years ago C. K. Meador¹ wrote an amusing but important article entitled "The Art and Science of Non-disease," drawing attention to common errors of diagnosis in the endocrine field, with resulting treatment of nonexistent disease. Some of the mistakes were due to laboratory errors. "Laboratory error syndromes," he wrote, "are the delight of the alert non-disease clinician; one must add, however, only before therapy has been initiated. In this regard they are probably the most responsive to treatment of all entities. One merely has to repeat the test once to see astounding results; for example, in what other non-disease or disease can one see a rise in the haemoglobin level from 6 to 14 g./100 ml. in two hours with only one iron tablet?"

Recently A. B. Bergman and S. J. Stamm² have discussed morbidity of cardiac non-disease in schoolchildren. They studied 93 children who were said to have had rheumatic fever or to have "something wrong with the heart." Seventy-five (81%) had nothing wrong with them—and thirty of these had been subjected to severe restrictions on the instruction of their doctor. Eighteen had organic heart disease, and six of them had been put under severe but unnecessary restrictions. They wrote that "Restriction of children with innocent murmurs is only slightly more absurd than restriction of the vast majority of children with an organic heart defect"; and "The diagnosis of heart disease may cause profound changes in the functioning of a child and his family, far beyond the immediate physical effects." On the basis of their

study of these 93 children they concluded that "The amount of disability from cardiac non-disease in children is estimated to be greater than that due to actual heart disease." They rightly criticize the restrictions imposed on children with congenital or acquired heart disease, advocating that they should be left to find their own level of activity of which they are capable. Parents fear that their child will drop dead if allowed to cry or to exert himself in other ways. In fact, as the writers state, sudden death is rare except in children with aortic stenosis.

Functional murmurs are exceedingly common in children. R. W. Quinn and E. S. Campbell³ found them in 44% of 4,039 Nashville schoolchildren. Unfortunately it is not easy to describe in words the difference between a functional murmur and the murmur of organic disease. The distinction is a matter of experience. In general, the functional murmur is louder when the child is lying down, it is increased by exertion, and it has a musical, twanging nature, or is very soft. Murmurs in the newborn period frequently suggest serious congenital heart disease to the unwary, only to disappear in a few days. The venous hum, the to-and-fro murmur beneath the clavicle, can easily lead the doctor towards the diagnosis of a patent ductus arteriosus, while the true nature of the murmur could be readily established by causing its disappearance on rotating the head or by pressure on the vessels of the neck. The tachycardia of excitement or nervousness and the raised systolic blood pressure under the circumstances of the doctor's examination can likewise lead to the wrong diagnosis of cardiac disease.

Now R. S. Illingworth,⁴ of Sheffield, has tried to dispel "Fallacies in Four Fevers." Discussing measles, German measles, chicken-pox, and mumps, he questions the value of some of the time-honoured methods of managing children with these infections and quotes with approval N. L. Browse's remark that "the bed is often a sign of our therapeutic inadequacy."⁵ Certainly many doctors as well as parents would agree with Illingworth that too long confinement to bed of children with these fevers can do actual harm and give no benefit. He is likewise critical of the isolation and medication of these patients on principles that may be long accepted but have escaped careful scrutiny. When prescribing treatment, he says, one should always ask three questions: What good may it do? What harm may it do? What harm may be done by not giving this treatment?

Oesophageal Function in Diabetes

Among the better-known neurological complications of long-standing diabetes are peripheral neuropathy, impotence, diarrhoea, and postural hypotension. The exact nature of the neurogenic defect is still a matter of debate, and the effects are often complex and are not necessarily clinically apparent. In the gastrointestinal tract, for example,^{1,2} symptomless gastric atony can result in a radiological appearance similar to that produced by vagotomy,³ whereas diarrhoea in some patients may be associated with steatorrhoea or with changes in bowel flora.⁴

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