of luteinising hormone and follicle stimulating hormone to their releasing hormone.

In any case the endocrinological abnormalities which Dr Young and others describe are not specific and could not be used to form the basis of "a more precise and objective" diagnosis of idiopathic oedema.

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¹ Al-Khader AA, Aber GM. The relationship between the "idiopathic oedema syndrome" and sub-clinical hypothyroidism. *Clin Endocrinol* 1979;10:271-9.

² Lewallen CG, Rall JE, Berman M. Studies of iodalbumin metabolism II. The effects of thyroid hormone. *J Clin Invest* 1959;38:88-101.

Artificial ventilation for neurological disease

SIR,—I agree with Dr J G Douglas and others (18 June, p 1943) that in patients with respiratory insufficiency due to neurological disease arterial blood gas studies are of limited value in assessing the need for ventilation. Their confidence in clinical assessment alone can hardly be justified, however, when in 10 out of 46 cases a respiratory arrest had occurred before mechanical ventilation was instituted. Three of these patients suffered irreversible cerebral damage.

Regular vitalograph measurements together with regular clinical assessment give a clear indication of the need for mechanical ventilation in patients in whom the neurological cause of respiratory insufficiency is not intracranial. Once the forced vital capacity has fallen to 15 ml/kg body weight mechanical ventilation is essential.

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SIR,—In the retrospective study on artificial ventilation for neurological disease by Dr J G Douglas and others (18 June, p 1943) it is disturbing that nearly 25% of the patients suffered cardiorespiratory arrest before ventilation was initiated, indicating inadequate respiratory monitoring. In this unit over the last 10 years, 18 patients with neurological disease have been ventilated (13 with Guillain-Barré syndrome, 4 with myasthenia gravis, and 1 with muscular dystrophy), none of whom progressed to respiratory arrest before ventilation. While monitoring of cough power and deglutition are obviously mandatory it is vital to supplement these observations with two simple objective tests—that is, twice daily measurement of forced vital capacity and daily chest x ray examination. Monitoring of the forced vital capacity will allow downward trends to be noted, and the chest radiograph will show evidence of basal absorption collapse, indicating inadequate sputum clearance and hypoventilation.

It is our practice to initiate ventilation if cough power is inadequate to clear bronchial secretions, if either exhaustion or confusion becomes apparent, or if the forced vital capacity has fallen to 25%¹ of the predicted value or less than 1.0 l in an adult.² Following these principles has led to the results obtained above, and we believe that these criteria should be emphasised to medical house officers as this will prevent this type of patient from

languishing on the general medical ward and progressing to respiratory arrest. Dr Douglas and others thought it paradoxical that nine patients had normal blood gas tensions up to the point of ventilation; this is not surprising as these parameters are preserved until late in ventilatory failure, becoming abnormal just before respiratory arrest. In properly monitored patients examination of blood gases plays only a minor role since intermittent positive pressure ventilation should be started before the development of abnormal arterial gas tensions.²

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¹ Jones ES. *Essential intensive care*. Philadelphia: Lippincott, 1978:46.

² Jones ES. *Intensive care*. Baltimore: University Park Press, 1982:358.

Exercise, health, and medicine

SIR,—In their cautionary letter concerning the dangers of recommending exercise in asymptomatic men Dr J E Cotes and Dr J W Reed (11 June, p 1895) imply that the occurrence of ischaemic changes during exercise in their subjects is synonymous with their having ischaemic heart disease and thus an increased risk of sudden death. This is not the case, and their figures give an unduly pessimistic view of the consequences of exercise.

Not all patients with ischaemic heart disease develop signs of ischaemic change during exercise electrocardiography. The precise proportion depends on the criteria used to categorise an exercise test as positive or negative. Using the generally accepted figures of ST segment depression of more than 1 mm 0.08 seconds after the J point, Bartel¹ suggests true positive rates ranging from 38% for patients with angiographically determined single vessel disease to 78% for triple vessel disease. A good average for unstratified though symptomatic patients is 65%. Stress electrocardiography also produces a number of false positive results, which my own and other series suggest may be of the order of 10%.

As the annual mortality for 40-44 year old men in the United Kingdom is one per 1000, a prevalence rate for ischaemic heart disease in that group at 3% or 30 per 1000 is not unreasonable. The proportion of positive responders who actually have ischaemic heart disease depends on the prevalence of ischaemic heart disease in the population from which they are drawn (table).

Thus with a prevalence of ischaemic heart disease of 3%, only 16.7% (195/(195+970)) of possible tests were correct; with a prevalence of 75%, 95.1% (4875/(4875+250)) of positive tests were correct. In other words in populations with a low prevalence of ischaemic heart disease, such as asymptomatic men, the

A population of 10 000 undergoing a test with a sensitivity (true positive rate) of 65% and a specificity (true negative rate) of 90%

	No subjects	Positive test	Negative test
3% prevalence of ischaemic heart disease:			
Ischaemic heart disease	300	195	105
No ischaemic heart disease	9700	970	8730
75% prevalence of ischaemic heart disease:			
Ischaemic heart disease	7500	4875	2625
No ischaemic heart disease	2500	250	2250

proportion of positive responders with ischaemic heart disease is only one in six. The exercise electrocardiogram is therefore an inefficient and misleading way of detecting hidden ischaemic heart disease in asymptomatic men; this view is accepted by such diverse bodies as the Royal College of Physicians and the Civil Aviation Authority.² The table also shows how successful stress electrocardiography can be in hospital populations selected by symptoms.

I would suggest that a more logical way to approach the fears of the large scale prescription of exercise in asymptomatic men would be by using a simple, possibly self administered questionnaire covering known risk factors for ischaemic heart disease such as smoking, obesity, and family history, combined with a blood pressure recording. Though by no means foolproof in the detection of asymptomatic ischaemic heart disease, it would grade people according to risk and allow a more logical assessment of the risks of exercise. It would, I believe, be more efficient than relying on misleading and expensive tests.

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¹ Bartel AG. Exercise stress testing—current status. *Cardiology* 1979;64:170-89.

² Report of a working party of the cardiology committee of the Royal College of Physicians of London. The cardiovascular fitness of airline pilots. *Br Heart J* 1978;40:335-6.

Increasing prevalence of diabetes mellitus in children

SIR,—Dr Sarah Stewart-Brown and others report an increasing prevalence of childhood diabetes based on data from British birth cohort studies (11 June, p 1855). We have recently reviewed data from Scotland and also find evidence of a substantial rise in the incidence of this disease.¹

A computer file of all admissions to Scottish hospitals in 1968-76 was searched to identify the 2505 children aged less than 19 years with diabetes. A procedure was devised to estimate the incidence of first admissions, enabling us to examine changes in the incidence of the disease over the period of the study. The table shows these rates. In the nine years the incidence of juvenile onset diabetes may have increased by as much as 80%.

Incidence of diabetes mellitus in children in 1968-76

Year	Estimated annual incidence (per 100 000 children aged 0-18 years)		
	Boys	Girls	Total
1968	10.2	9.8	10.0
1969	12.0	10.3	11.2
1970	11.3	13.3	12.3
1971	13.8	11.4	12.7
1972	14.2	13.4	13.8
1973	16.0	14.3	15.2
1974	15.0	13.9	14.5
1975	17.5	14.4	15.9
1976	19.4	17.1	18.3

*Age standardised.

Considerable variation was found in the incidence in the different counties of Scotland. The central lowlands was an area of low incidence, and the rates in the northernmost mainland counties were twice as high as in the cities of Edinburgh and Glasgow. Our data also provided some indirect support for the suggestion that the disease is more likely to arise in socially advantaged groups. Within

Glasgow, there was an inverse association between the incidence in each city ward and the average number of persons per room. There was no evidence of space time clustering of the disease in different years within the parishes of each county.

Our epidemiological observations are compatible with the disease having a viral aetiology, but it is difficult to explain the striking rise in incidence over the study period on this basis.

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¹ Patterson CC, Thorogood M, Smith PG, Heasman MA, Clarke JA, Mann JI. Epidemiology of type I (insulin dependent) diabetes in Scotland 1968-76: evidence of an increasing incidence. *Diabetologia* 1983;24:238-43.

Perioperative antibiotics

SIR,—While we agree with most of Mr M R B Keighley's comments (11 June, p 1844) we disagree about the role of carefully chosen single dose prophylaxis in elective biliary surgery. In an ideal world, of course, only those patients who can be shown to be at risk should receive prophylaxis.

But, although several high risk factors—for example, obesity, jaundice, old age, and diabetes—can be identified preoperatively, others, and particularly the decision whether or not to explore the common bile ducts, can be determined only at the time of operation as a result of findings on cholangiography or laparotomy. It is then too late to give true prophylaxis as the tissues at risk should have been "loaded" with antibiotic before that period of risk began. This principle was clearly established after the studies of Burke.¹

In prospective randomised double blind studies in over 700 patients carried out in the Wessex region since 1975,² we have shown that wound sepsis developing in hospital in elective biliary surgery has been virtually eliminated (occurring in less than 0.5% of cases), while later infection developing after discharge from hospital occurs in less than 1.5% of cases. By excluding patients with suspected antibiotic hypersensitivity we have not seen toxic reactions, nor has the emergence of resistant organisms been encouraged by this single dose policy. We now believe that withholding this simple, safe, and highly effective form of treatment from virtually any case of elective biliary surgery is unethical. The only exclusion should be hypersensitive patients who are thought to be low risk, but this assessment can be only a probability and not a certainty. High risk hypersensitive patients justify single dose gentamicin pro-

phylaxis, and this we believe is one of the rare occasions when aminoglycosides are warranted for prophylaxis.

Many surgeons argue that low risk cases do not need prophylaxis. Several of these surgeons, however, do not have accurate audit data, particularly for late infections. We believe that the onus is now on them to prove that they can produce equally good results in a large number of low risk patients by withholding single dose prophylaxis.

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¹ Burke JF. Prevention of sepsis following surgical operation: an overview. In: Karran SJ. *Controversies in surgical sepsis*. New York: Praeger Scientific, 1980:107-14.

² Karran SJ, Tasker GD, Walmsley BH, et al. Multi-centre confirmation of the value of single dose antibiotic prophylaxis in elective biliary surgery. *Eur Surg Res* 1983;66. (Proceedings of XVIII congress of European Society for Surgical Research, Athens 1983.)

SIR,—I disagree with Mr M R B Keighley's statement (11 June, p 1844) that intraoperative contamination from the vagina is inevitable if it is opened and the consequent implication regarding the role of prophylactic antibiotics in hysterectomy surgery. It is true that preoperative painting of the vagina with an antiseptic agent may be less efficacious than skin preparation elsewhere, but I find that even without antibiotics the uncomplicated total abdominal hysterectomy—and, indeed, most hysterectomies—does not suffer septic complications provided that the surgical technique is sound. Haemostasis is never 100% in the deep pelvic tissues and drainage is mandatory; I prefer to close the entire oozing area of the cut vaginal vault around a tube drain, which is left in situ until the next morning (by which time it has often dropped out). Most patients then have a fever and no tachycardia.

I find it difficult to accept that the widespread use of prophylactic antibiotics, even short term, will not ultimately induce bacterial resistance in the ward, particularly against the present day background of liberal (though necessary) use of therapeutic antibiotics for sexually transmitted infections. Again, perioperative antibiotics can never offer complete immunity from septic complications, and while their use is of unquestioned value for hysterectomies (as also other operative procedures) performed in the presence of pelvic inflammatory disease or where the large bowel has been opened, the balance of their advantage in other cases is at best doubtful.

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SIR,—Mr M R B Keighley (11 June, p 1844) emphasises the importance of septic complications in postoperative morbidity.

The use of perioperative antibiotics is now an accepted procedure in a wide range of

abdominal operations. What remains debatable, however, is the antibiotic to be given and its route of administration. To prevent septic complications developing in abdominal operations it is essential for adequate concentrations of the correct antibiotic to be present in the blood and in the wound tissues. In addition, the antibiotic must be effective throughout the operation. For these reasons, we pioneered the technique of "preincisional injection."¹ We were gratified to see this technique described in Mr Keighley's article with the comment: "This method is at least as good as systemic administration, and high concentrations of antibiotic are maintained both in the wound and in the circulation."

Three prospective randomised trials from different institutions have shown the effectiveness of preincisional antibiotics in preventing septic complications in a wide range of high risk abdominal operations.^{2,3} Furthermore, this technique was superior to administering a single dose of antibiotic by the intravenous route. We believe that preincisional administration has two advantages over standard intravenous dosage: (a) higher wound tissue concentrations are present throughout the operation, and (b) blood concentrations of antibiotic remain in the therapeutic range for a longer period.

For these reasons, we now routinely use the preincisional route for prophylactic antibiotics in abdominal surgery.

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¹ Armstrong CP, Taylor TV, Reeves DS. Preincisional intraparietal injection of cephamandole: a new approach to wound infection prophylaxis. *Br J Surg* 1982;69:459-60.

² Armstrong CP, Dixon JM, Davies GC, Duffy SR, Chetty U. A prospective randomised trial of preincisional injection of cephamandole in wound infection prophylaxis. *Surg Gynaecol Obst* (in press).

³ Taylor TV, Walker WS, Mason RC, Richmond J, Lee D. Preoperative intraparietal (intra-incisional) cefoxitin in abdominal surgery. *Br J Surg* 1982; 82:461-2.

Treatment of bacterial meningitis

SIR,—Dr C S Nanayakka (14 May, p 1578) reports a case of bacterial meningitis treated successfully with chloramphenicol. I can corroborate his findings with numerous cases in Zambia, where we used chloramphenicol successfully when initial treatment of bacterial meningitis with penicillin or ampicillin failed or relapsed. In 1973 we decided to use chloramphenicol when initial treatment with ampicillin was not satisfactory on sensitive organisms.

The β lactams are excellent bactericidal agents, but the penetration of those hydrophilic and lipid insoluble molecules into the cerebrospinal fluid is poor unless the meninges are inflamed.¹ Chloramphenicol penetrates readily into the cerebrospinal fluid, building up to high concentrations (30-35 g/ml).² It is bactericidal to three common meningeal pathogens: *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Neisseria meningitidis*.³ Intravenous administration is required only on the first day; effective concentrations can be maintained later by oral administration.

In 1975 there was an outbreak of meningococcal meningitis (type A, resistant to sulphonamides) in Lusaka. Penicillin was used routinely but three patients relapsed after