Together with colleagues in the University of Dundee I am completing an analysis of views of a one-in-eight sample of Scottish general practitioners concerning the consultation. From this it is clear that GPs (and a sizable proportion in the survey were not college members) do not share Dr Raine Roberts's view (p 508) on the consultation. There is very strong support for helping new entrants to general practice to readjust their approach to clinical medicine to suit the different circumstances of general practice.

May I take this opportunity to thank the 350 general practitioners who have assisted in the survey?

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Metabolic effects of salbutamol

SIR,—Intravenous salbutamol may produce significant metabolic effects^{1,2} and the recent report by Mr A Neville and others (12 February, p 413) comparing the metabolic effects of aerosol and intravenous salbutamol draws attention to these. In particular, marked hypokalaemia and rises in free fatty acid levels have been observed following intravenous salbutamol. This is worrying since these changes have been implicated in the genesis of cardiac dysrhythmias and it is considered advisable to monitor the electrocardiogram when administering intravenous infusions of salbutamol in the acute asthmatic state. Indeed, Leitch *et al*² have shown that the cardiovascular effects of intravenous salbutamol are pronounced when hypoxia is combined with hypercapnia.

The metabolic changes following oral, intravenous, and aerosol salbutamol differ only in magnitude rather than effect and are a consequence of the differing metabolism of the drug when administered by these routes. Evans³ has studied the absorption, metabolism, and excretion of salbutamol in detail. Salbutamol absorbed from the gut is conjugated in the liver to a metabolite with negligible adrenoreceptor activity, and this is excreted in the urine. Intravenous salbutamol tends to remain in the free form and only 27% of the drug excreted in the urine over 24 h has been metabolised. Most of the aerosol-administered salbutamol is swallowed, but if salbutamol is introduced directly into the lungs through a bronchoscope most of the dose in the plasma and urine is present as free salbutamol, suggesting that it is not metabolised in the lung. There is also a slower excretion rate for aerosol salbutamol which probably indicates its slow removal from the lungs.

Hence administering salbutamol intravenously produces higher plasma levels of the active drug with higher magnitudes of change in the metabolic and systemic effects of beta-2 agonism. However, oral salbutamol may produce changes in insulin, glucose, glycerol, and free fatty acid levels,⁴ although hypokalaemia does not seem to occur,⁵ and aerosol salbutamol can lower plasma potassium in certain hyperkalaemic conditions such as familial hyperkalaemic paralysis.⁶

Aerosol salbutamol has many advantages over oral and intravenous salbutamol. It produces negligible metabolic changes with a lower incidence of cardiovascular and other systemic side effects. More important, Hetzel and Clark⁷ have shown that aerosol salbutamol

produces a prolonged bronchodilator effect and is more potent than an equal intravenous dose.

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¹ Goldberg, R, *et al*, *Postgraduate Medical Journal*, 1975, **54**, 53.

² Leitch, A G, *et al*, *British Medical Journal*, 1976, **1**, 365.

³ Evans, M E, *et al*, *Xenobiotica*, 1973, **3**, 113.

⁴ Taylor, M W, *et al*, *British Medical Journal*, 1976, **1**, 22.

⁵ Deacon, S P, *Lancet*, 1976, **1**, 1302.

⁶ Wang, P, and Clausen, T, *Lancet*, 1976, **1**, 221.

⁷ Hetzel, M R, and Clark, T J H, *British Medical Journal*, 1976, **2**, 919.

Respiratory distress syndrome

SIR,—Further to your leading article (11 December, p 1403) I notice in your references you omit Geoffrey Dawes of Oxford,¹ who has made the single most important contribution to the prevention of respiratory distress syndrome this century. Surfactant and betamethasone are interesting research points, but simple physiology is more important.

When a child is born only 60-70% of its total vascular capacity is patent. Its blood volume at birth will also be 60-70% of what it should be, the remainder being in the placenta. If the cord is clamped before the lungs have expanded and before sufficient time has been allowed for the transfusion from the placenta to the baby to occur (limited by physical principles, diameter of blood vessels, length of cord, and negative pressure produced by inspiratory effort) this 60-70% of the total blood volume will suddenly be redistributed into the potential 100% vascular capacity. The "late arrivals" and most sensitive organs, the lungs, will suffer most and other vascular organs such as the liver to some extent. This will limit access, and possibly production, of the normal corrective enzymes to the pulmonary tissue. Respiratory distress syndrome will gradually develop.

In 1975 and 1976 we delivered 1754 babies in this unit (prematurity rate 3%, caesarean section rate 5%, forceps and ventouse rate 10%, induction rate 21%, and 6.5 of the mothers were aged 40 years or more). Our perinatal mortality rate was 8/1000 and our neonatal death rate 4/1000. The rule for all newborn babies here is, delayed clamping of the cord (if the cord is placed across the palm and four fingers gently applied to it its decompression with each vigorous inspiratory effort by the baby can be felt), thereafter immediate oxygenation, warmth, glucose via the intragastric route (to help the liver to do its work), and no handling or drips. We have one advantage over most units: the neonatal paediatrician is the obstetrician. The above approach was adopted on the basis of Dawes's teaching and I think he is right. Can you quote better results?

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¹ Dawes, G S, *Foetal and Neonatal Physiology*, pp 161-2. Chicago, Year Book Medical Publishers, 1968.

Rising incidence of childhood diabetes

SIR,—The nation-wide interest in diabetes mellitus in childhood¹ is focused mainly on possible aetiological factors. It seems timely

to draw attention to a considerable increase in the incidence of childhood diabetes. The numbers of newly diagnosed cases of diabetes in children under the age of 13 years seen at the Royal Hospital for Sick Children, Glasgow, in the past 44 years are given below, grouped into periods of four years.

1933-6: 27	1957-60: 39
1937-40: 41	1961-4: 62
1941-4: 17	1965-8: 48
1945-8: 25	1969-72: 66
1949-52: 19	1973-6: 113
1953-6: 25	

It is known that the mortality (and possibly the morbidity) from diabetes falls in time of war.² Our figures show that the morbidity in children certainly fell in the Glasgow area during the second world war and incidence did not return to the prewar level until the late 1950s. The incidence increased in the 1960s and exploded in the middle 1970s, so that we are now seeing about five times as many new cases as were seen 20-30 years ago.

Spot checks were made at two other hospitals. Stobhill Hospital in Glasgow is a large general hospital with a children's unit. In 1953-6 10 new cases were seen. In 1960-3 there were 12 and in 1973-6 20. Glasgow Royal Infirmary is a large general hospital without a children's unit. In the period 1961-4 2 new cases in children under the age of 13 were seen and in 1973-6 there were 12.

The rise in incidence at the two latter hospitals indicates that the rise in incidence at RHSC is not due to a change in fashion diverting children to that hospital but represents a true increase of morbidity in the population. Our figures apply only to Glasgow, but conversations with colleagues suggest that they may be relevant to the country as a whole. Should that be so practitioners would be well advised to consider the possibility of childhood diabetes if there is a history of polyuria and polydipsia, a history which can always be elicited in childhood diabetes if the right questions are asked.

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¹ Bloom, A, Hayes, T M, and Gamble, D R, *British Medical Journal*, 1975, **3**, 580.

² Himsworth, H P, *Lancet*, 1949, **1**, 465.

Salbutamol-induced acidosis in pregnant diabetics

SIR,—With the increasing use of beta-sympathomimetics (in particular salbutamol) in the interruption of threatened premature labour side effects are becoming apparent. In particular the administration of intravenous salbutamol to pregnant diabetic patients can be associated with the development of significant metabolic acidosis.

I have observed two diabetic women in premature labour at 33 weeks and receiving salbutamol infusion who developed severe metabolic acidosis. Qualitative tests for serum ketones were negative in each case. Betamethasone was given in conjunction with salbutamol to these women to promote fetal lung maturity. Two similar cases were reported recently and the acidosis attributed to the betamethasone.¹

In order to elucidate further the metabolic effects of salbutamol eight normal non-diabetic patients in premature labour and receiving the

drug were studied. They all showed an increase in serum lactate, ketones, and non-esterified fatty acids and a decrease in serum bicarbonate, indicating the development of compensated metabolic acidosis. These findings in normal patients dictate increased care in the use of salbutamol, particularly in diabetic women, in whom the exaggerated changes in glycolysis and lipolysis may contribute to the development of severe acidosis.

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¹ Baillie, P, *et al*, *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 1976, **16**, 94.

Jejunoileal bypass for obesity

SIR,—Minerva (15 January, p 178) notes that the Cleveland Clinic has abandoned jejunoileal bypass as a treatment for obesity because of high mortality (11.1%) and serious morbidity in 27 patients. This decision would seem to be well justified. I feel constrained to comment, however, lest readers might conclude that such is the general opinion of others experienced in this field.

In view of this subject¹ I quoted six series, all of which contained well over 100 patients, wherein the average overall mortality was 5.4%. This included the report of Payne *et al*,² who pioneered the operation and who understandably, therefore, had a mortality (9.7%) somewhat higher than the others. It has to be realised that the massively obese patients on whom this procedure is performed only as a last resort are bad-risk material and that consequently some deaths may occur from causes other than the bypass—for example, pulmonary embolism or myocardial infarction. In my personal experience of 198 patients over the past seven years the operative mortality has been two patients (1%); there have been six late deaths attributable to the bypass (3%) and four due to other causes (2%).

I have been pleased to find that the large majority of patients have benefited considerably by the weight reduction achieved and sustained. Breathlessness and backache have been improved, varicose ulcers healed, diabetes corrected, and hyperlipidaemia reduced. Three pregnancies have occurred without complication. Social and economic rehabilitation has been particularly gratifying. It is accepted, however, that about half have experienced, to a greater or lesser degree, some undesirable side effects. These have included foul flatus, gaseous distension of the colon (pseudo-obstruction), arthralgia, fluid and electrolyte difficulties, folate deficiency, and occasionally renal calculi and persistent diarrhoea. Pilkington and Gazet³ have pointed out, and I would agree, that the last is usually due to excessive drinking or eating and can be dealt with appropriately.

By far the most worrying side effect, however, has been acute fatty liver and liver failure. Of my patients, 93% had fatty infiltration of the liver at the time of the bypass operation. The latter was abandoned in two other patients because histological examination proved early cirrhosis. The fatty change was increased in 46% and 44% respectively at the routine liver biopsies performed after one and two years. Four patients have developed cirrhosis during this time, being

attributable to alcohol in two. Fourteen patients have developed symptoms which one now recognises as being due to acute fatty liver and four of these died from liver failure or Gram-negative septicaemia. The acute fatty liver can be reversed by early parenteral nutrition and a high-protein diet. Hence in future the mortality due to this cause should be reduced by awareness and prompt management.

There is no doubt that the problems associated with jejunoileal bypass can be reduced by careful patient selection. Prader-Willi syndrome, feeble-mindedness, inadequate personality, alcoholism, primary psychiatric illness, and known heart valve disease are contraindications to the operation. Furthermore, surgeons performing this type of surgery are committed to a close and long-term follow-up of their patients. They must be alert to the potential side effects, treat them early and vigorously, and be prepared to reverse the bypass without delay if they find lack of response or recurrence of symptoms despite treatment. They should also be prepared to reverse the operation if the patient feels unable to cope with such occasional difficulties as refractory arthralgia and persistent diarrhoea.

Perhaps there is something to be said for planning a reversal procedure in difficult patients when the desired benefits of weight reduction have been attained. At least this will have been a major achievement in a difficult problem for which other forms of treatment have been uniformly ineffective.

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¹ Baddeley, R M, in *Recent Advances in Surgery*, ed S Taylor, p 113. Edinburgh, Churchill, 1977

² Payne, J H, *et al*, *Archives of Surgery*, 1973, **106**, 432.

³ Pilkington, T R E, and Gazet, J C, *British Medical Journal*, 1974, **4**, 311.

Diabetic feet

SIR,—Your leading article on this subject (5 February, p 338) stresses the conservative treatment of diabetic patients with swollen ulcerated feet. May I emphasise the advice given to raise the limb?

The usual procedure is to raise the limb 20-30 cm (8-12 in) from the bed. In my experience¹ the need for resolution of oedema is so urgent that the leg should be raised to as near 90° as possible every day until healing is complete. In three patients treated by this method there was extrusion of dead bone before complete healing of the affected foot took place. The patients were allowed to sleep normally flat each night.

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¹ Bourne, I H J, *British Medical Journal*, 1974, **2**, 581.

SIR,—I read your leading article on this subject (5 February, p 338) with great interest. Chiropodists have for many years been closely associated with the management of foot lesions in diabetics; indeed, it was the need for assistance with the treatment of diabetics which resulted in chiropodists being employed in hospitals at all. Until the 1930s chiropodists were not considered to be of any importance

in treating anything except superficial lesions and worked in isolation from other disciplines as private practitioners. In the 1930s some enlightened medical men saw that their knowledge and skills would be useful in diabetic departments. Unfortunately, 40 years or so later many diabetic departments in the United Kingdom are still without chiropodists.

There is just one part of the article which slightly disturbs me. It states that "every diabetic patient should be taught the importance of foot hygiene, sensible footwear, and regular chiropody," which of course is absolutely right, but goes on to say, "for the elderly this will usually mean the services of a chiropodist." I cannot imagine that it is intended to imply that non-elderly diabetics should do their own chiropodial treatment. If that is the meaning I would hasten to urge diabetics not to follow such advice, since self-administered chiropodial treatment could be dangerous. Diabetic patients with neuropathy cutting their own corns with razor blades would surely increase the incidence of ulcers. All diabetics, irrespective of age, require the services of State registered chiropodists.

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Lumbar epidural analgesia in labour

SIR,—We have read with interest the article by Dr I J Houlst and his colleagues (1 January, p 14) and the letter from Professor B M Hibbard and others (29 January, p 286) on the relationship between instrumental delivery and lumbar epidural analgesia. At this hospital the assisted delivery rate rose between 1970 and 1975 from 14% to 30% associated with an increase of the epidural rate from 4% to 58%. Kielland's forceps rotations became as common as straight forceps deliveries. Because of this we investigated a possible method of increasing the spontaneous vaginal delivery rate. Until recently patients were made to start pushing as soon as the second stage of labour was diagnosed. The forceps rate was particularly high in the patients in whom full dilatation was diagnosed by routine vaginal examination before the presenting part was visible at the vulva. We divided 100 of these patients randomly into two groups. Group A were made to push immediately, while group B were left lying on their side until the head became visible or until progress in rotation and descent of the head ceased as judged by regular vaginal examination.

The table shows the method of delivery in the two groups. It can be seen that although there is no obvious reduction in the forceps rate there is a halving of the rotation rates in group B. This is due to a reduction of the number of occipitolateral positions. This would support the hypothesis of Professor Hibbard and his colleagues concerning the

Method of delivery of patients in whom full dilatation was diagnosed before the head became visible at the vulva

Method of delivery	Group A	Group B
Spontaneous	22	25
Instrumental:		
Occipitoanterior	10	15
Occipitolateral	12	5
Occipitoposterior	6	4