According to the *Data Sheet Compendium 1983-84* salbutamol sulphate in the form of Ventolin Respirator Solution can be given by nebuliser in a single dose of 10 mg. This can be repeated four times daily giving a total 24 hour dose of 40 mg. The amount of salbutamol in one metered dose from the inhaler is 100 µg and the recommended total 24 hour dose is only 600-800 µg. Thus we are allowed to give 100 times more salbutamol by nebuliser in a single dose than we can by the inhaler. Also in any 24 hour period we can give 50 times more salbutamol by nebuliser than by pressurised aerosol. The differences between these official recommendations are inexplicable and are certainly not reflections of any differences in efficiency of nebulisers compared with the metered dose inhaler.

The restriction on the use of salbutamol and other β_2 agonist inhalers is an anachronistic remnant of the 1960s experience and regrettably perpetuates the myth that the bronchodilator inhalers are dangerous. These warnings should be removed from inhalers since they are not dangerous and what is more there is no generally accepted recommended dose. If this is not done unnecessary patient anxiety, confusion, and respiratory distress will continue to be created by these illogical warnings.

G K CROMPTON

Northern General Hospital,
Edinburgh EH5 2DQ

¹ Inman WH, Adelstein AM. Rise and fall of asthma mortality in England and Wales in relation to the use of pressurised aerosols. *Lancet* 1969;ii:279-85.

² Anonymous. The proper use of aerosol bronchodilators. *Lancet* 1981;i:23-4.

³ Crompton GK, Grant IWB, Bloomfield P. Edinburgh Emergency Admission Service: report on 10 years' experience. *Br Med J* 1979;iii:1199-201.

Effects of mild exercise on serum lipoproteins and metabolites of arachidonic acid

SIR,—The paper by Dr R Rauramaa and others (25 February, p 603) puts forward a potentially important hypothesis that relates exercise induced changes in high density lipoproteins with parallel changes in PGI_2 synthesis. I think that the supporting data must be interpreted with great caution.

The plasma concentrations of 6-keto-prostaglandin $\text{F}_{1\alpha}$ ($\text{PGF}_{1\alpha}$) are expressed in pmol/l in table II. Underneath is a conversion formula relating pmol/l of 6-keto- $\text{PGF}_{1\alpha}$ to pg/100 ml. Unfortunately, there is a 1000fold discrepancy in the conversion factor. In fact, 1 pmol/l of 6-keto- $\text{PGF}_{1\alpha}$ is equivalent to 37 pg/100 ml of 6-keto- $\text{PGF}_{1\alpha}$. Though this is not in itself particularly important, it may lead readers to erroneous interpretation of the data. The initial value of 6-keto- $\text{PGF}_{1\alpha}$ in the control group is 422.4 pmol/l or 156 pg/ml. In 1981 the *BMJ* published an article on PGI_2 in diabetes in which plasma concentrations of 6-keto- $\text{PGF}_{1\alpha}$ were of the same order of magnitude as in the present paper.¹ Two subsequent letters provided cogent criticism of these concentrations, pointing out that they were extremely high.^{2,3} The plasma concentration of 6-keto- $\text{PGF}_{1\alpha}$ in normal subjects has been reported to be less than 5 pg/ml in most circumstances, using assay systems based on gas chromatography and electron capture detection, radioimmunoassay and negative ion chemical ionisation mass spectrometry.⁴⁻⁶ An entirely independent method based on measuring urinary excretion

of donor 6-keto- $\text{PGF}_{1\alpha}$ (another metabolite of PGI_2) also predicted similar plasma concentrations of 6-keto- $\text{PGF}_{1\alpha}$.⁷ These concentrations are an order of magnitude lower than those reported in the paper by Rauramaa.

Radioimmunoassay of plasma prostaglandins is notoriously difficult, but results that differ so noticeably from those obtained by others with state of the art methods must be interpreted with caution. The very small changes in 6-keto- $\text{PGF}_{1\alpha}$ after exercise that were reported become meaningless when viewed in this context. Moreover, the significant correlation with the increase in serum high density lipoprotein subfraction 2 cholesterol in the group taking regular exercise must be treated with the greatest reservation.

M L WATSON

Department of Medicine,
Royal Infirmary,
Edinburgh EH3 9YW

¹ Ylikorkala O, Kaila J, Viinikka L. Prostacyclin in diabetes. *Br Med J* 1981;283:1148-50.

² Carey F, Forder RA. Prostacyclin and thromboxane A. *Br Med J* 1982;284:419.

³ Greaves M, Preston FE. Prostacyclin and thromboxane A. *Br Med J* 1982;284:419.

⁴ Christ-Hazellhof E, Nugteren DH. Prostacyclin is not a circulating hormone. *Prostaglandins* 1981;22:739-46.

⁵ Siess W, Dray F. Very low levels of 6 keto prostaglandin $\text{F}_{1\alpha}$ in human plasma. *J Lab Clin Med* 1982;99:388-98.

⁶ Blair IA, Barrow SE, Waddell KA, Lewis PJ, Dollery CT. Prostacyclin is not a circulating hormone in man. *Prostaglandins* 1982;23:579-89.

⁷ Fitzgerald GA, Brash AR, Falardeau P, Oates JA. Estimated rate of prostacyclin secretion into the circulation of normal man. *J Clin Invest* 1981;68:1272-6.

* *The authors reply below.—ED, *BMJ*.

SIR,—As Dr Watson correctly points out in his letter, the conversion factor in table II in our paper should be 37 pg/100 ml instead of 0.037 pg/100 ml, 35 pg/100 ml instead of 0.035 pg/100 ml, and 37 ng/100 ml instead of 0.037 ng/100 ml, when converting the concentration units to mass units in the arachidonic acid metabolites. We greatly appreciate that Dr Watson considers our hypotheses about the connection between changes in high density lipoprotein 2 (HDL_2) cholesterol and 6-keto- $\text{PGF}_{1\alpha}$ potentially important. He emphasises that our data must be interpreted with great caution.

We agree with his opinion on difficulties in radioimmunoassay of 6-keto- $\text{PGF}_{1\alpha}$ and its interpretation. Especially high absolute concentrations in plasma have been criticised. Unfortunately, no "very highly specific" antisera to 6-keto- $\text{PGF}_{1\alpha}$ exist. We have used that from the Pasteur Institute, which has been shown to be "highly specific" when the common arachidonic acid metabolites are considered. Some kind of cross reactivity must exist, however, because our values clearly exceed those reported by other methods. Therefore, probably the term "6-keto- $\text{PGF}_{1\alpha}$ like immunoreactivity in plasma" would have been more adequate than 6-keto- $\text{PGF}_{1\alpha}$. We have used principally the same technique as Ylikorkala *et al*, who have thoroughly tested the method and shown that plasma concentrations of 6-keto- $\text{PGF}_{1\alpha}$ will respond to both increasing and decreasing factors.¹ This is also our experience.

We found a statistically significant association (partial regression) between the change in serum HDL_2 cholesterol and the change in plasma 6-keto- $\text{PGF}_{1\alpha}$ concentration in the group taking regular exercise. On the other

hand, we did not observe any significant difference in the mean changes in plasma 6-keto- $\text{PGF}_{1\alpha}$ between the groups, although there was a trend towards a greater increase in the exercise group. Another interesting finding was the reduction in serum thromboxane B_2 produced by platelets ($\text{T} \times \text{B}_2$) in the exercise group.

Owing to obvious difficulties with methodology, the power of even controlled randomised trials such as ours to detect effects of exercise interventions remains relatively weak. Although we fully agree that caution in the interpretation is warranted, we think that our data suggest that " HDL_2 cholesterol contributes to the metabolism of prostacyclin."

RAINER RAURAMAA
KARI SEPPÄNEN

Kuopio Research Institute of
Exercise Medicine,
Puistokatu 20 SF-70100
Kuopio 10, Finland

JUKKA T SALONEN

Research Institute of Public
Health,
University of Kuopio, Kuopio,
Finland

KATRIINA KUKKONEN-HARJULA

Kuopio Regional Institute of
Occupational Health,
Kuopio, Finland

ERKKI SEPPÄLÄ
HEIKKI VAPAATALO

Department of Biomedical
Sciences,
University of Tampere,
Tampere, Finland

JUSSI K HUTTUNEN

National Public Health Institute,
Helsinki, Finland

¹ Ylikorkala O, Kaila J, Viinikka L. Prostacyclin in diabetes. *Br Med J* 1981;283:1148-50.

Hypertension in general practice

SIR,—I support Dr John Coope's comments on the lamentable state of management of patients with hypertension (24 March, p 880), and the Royal College of General Practitioners' initiative in anticipatory care, but I cannot agree with his solution to the logistics of the identification and management of hypertension.

The Medical Research Council's study of the treatment of mild to moderate hypertension relies on teams of nurses to identify and screen patients for high blood pressure—a system which is expensive and which could not be universally and permanently introduced into the National Health Service should the results of the trial show that benefits can be achieved from treatment. The practical answer surely lies in case finding. In a study reported in 1979 we clearly showed that in a three year period 77% of men aged between 35 and 69 in four Scottish general practices routinely attended their general practitioners and had blood pressure recordings documented.¹

A further study, supported by the Scottish Home and Health Department and involving 40 general practitioners and a population in excess of 65 000 in west central Scotland, is underway and is attempting to answer important questions. What proportion of patients aged between 35 and 64 years are routinely seen over a two year period? If routine blood pressures are then taken what proportion of patients have mild to moderate hyperten-

sion? If treated with an up to date drug regimen what success is achieved in blood pressure reduction?

We hope to publish results within the next year, and should the MRC trial show benefits from the treatment of mild to moderate hypertension, we will be able to comment on case finding and general practitioner follow up as a practical alternative to an expensive screening technique. This will have important consequences for general practice, for the National Health Service, and, most importantly, for the patient.

J H BARBER

Department of General Practice,
Woodside Health Centre,
Glasgow G20 7LR

¹ Barber JH, Beevers DG, Stewart GM, *et al.* Blood pressure screening and supervision in general practice. *Br Med J* 1979;i:843-6.

SIR,—I am a singlehanded general practitioner in north west London and I have been a trainer since 1975. I have been interested in hypertension for many years and for the past three have been compiling an alphabetical register of hypertensive patients in my practice. The blood pressure of every patient aged 30 or over who comes to the surgery for any reason is measured. If it is raised two further readings are taken on subsequent occasions. If it is consistently above 140/90 mm Hg at age 40 or below, or over 160/90 mm Hg in a patient aged 60 or above, the patient is classified as hypertensive and his name is entered in the register.

In addition, women on the oral contraceptive pill have their blood pressure measured at least twice a year, more often if raised, and antenatal and postnatal patients have it measured at each attendance at the surgery.

Investigations for all patients under 40 are carried out, and treatment is started after one reading if the blood pressure is very high—over 170/115 mm Hg—especially if there are symptoms. Patients under 40 with a very high blood pressure are in addition usually referred for hospital assessment. Patients are encouraged to reduce weight and stop smoking.

I have now collected 191 patients in my hypertensive register. In addition, seven patients who have died in the past three years while on the register are also recorded. Since my list size is about 2550, the prevalence of detected hypertension is 7.5%. It is therefore likely that there are still many patients who have not been detected. Probably, most of these are young men, who do not have cause to come to the surgery very often.

Of the seven patients who have died three have died from cerebrovascular disease, one from renal failure, one from left ventricular failure and fibrosing alveolitis, one from aortic incompetence, and one from toxæmia as a result of arteriosclerotic gangrene. This last patient and one of the three patients who died from cerebrovascular disease were also diabetic.

J WOOLICH

London NW10 8TA

Where's the block?

SIR,—Dr A F Rickards (10 March, p 737) is right when he says "... the British patient with cardiovascular disease is not well served by the medical profession." He is referring to

cardiac pacing, but the problem with coronary bypass surgery is even more depressing. In terms of quality and duration of life cardiac pacing and bypass surgery must be among the most rewarding of medical procedures, and yet 15 000 patients a year in the United Kingdom are turned away.¹

The cruel rationing of these procedures weighs heavily on the regional cardiac centres, and every cardiologist must, as I do, have to turn away patients he could and should be helping. One of the ways in which the service is restricted is by the unwillingness of district and regional management teams to appoint additional consultant cardiologists and cardiac surgeons. How tragic that patients should be dying for the want of these doctors while there is an excess of able and well trained senior registrars who cannot get consultant posts.

M K TOWERS

Thoracic and Cardiac Surgical Unit,
Harefield Hospital,
Middlesex UB9 6JH

¹ Joy M. Who cares about cardiology? *Br Med J* 1984; 288:339-40.

Kielland's forceps delivery

SIR,—Dr C J C Siggers (7 April, p 1092) suggests rotating the persistent occipito-posterior head with "ordinary" forceps in order to avoid "the well known injuries which can result from the use of Kielland's forceps." "Ordinary" forceps, however, have a pelvic curve and if rotated within the pelvis will cause damage far more severe than the injuries which may follow Kielland's rotation. Although the technique may have been successful years ago in the hands of Dr Siggers and the late Mr Mitchell, I think it would nowadays not be regarded as a justifiable practice.

J O DRIFE

Department of Obstetrics and Gynaecology,
Leicester Royal Infirmary,
Leicester LE2 7LX

Relevance of osteoporosis in women with fracture of the femoral neck

SIR,—Although Dr J M Aitken has reported some interesting findings we do not agree with some of his conclusions (25 February, p 597). He has highlighted the imperfect correlation between bone density and fracture risk. A possible confounding factor is the age distribution of the two fracture types. In a similar study of femoral neck fracture in 150 elderly women we found patients with trochanteric fractures were an older and frailer group (average age 83.7 years) than those with cervical fractures (average age 79.3 years) ($p < 0.001$).¹ This rising ratio of trochanteric to cervical fractures with increasing age has also been found in other studies.^{2,3} Dr Aitken showed that cortical thickness declines with increasing age. This could partly explain why cervical fractures occurred twice as often in those "without osteoporosis" as trochanteric fractures.

The other important factor is the "fall," which is a multifactorial event. Dr Aitken quoted a paper by Sheldon whose study included four times as many women as men but contrary to what was stated contained no measure of the relative frequency of falls.⁴

There are 2½ times as many women as men in the 75 years and over age group. There is evidence that the annual prevalence rate of falls in women is twice that of men,^{5,6} but environmental factors, particularly that women are more likely to live alone, are of considerable importance. While the fracture rate rises exponentially with increasing age, liability to falls does not and may diminish in women after the age of 85.⁵ This does not support the hypothesis that postural instability is the major determinant for femoral neck fracture.

H TAGGART

T R O BERINGER

Department of Geriatric Medicine,
Queen's University of Belfast,
Belfast BT9 7BL

¹ Beringer TRO, McSherry DMG, Taggart HMcA. A microcomputer based audit of fracture of the proximal femur in the elderly. *Age Ageing* (in press).

² Alffram P-A. An epidemiologic study of cervical and trochanteric fractures of the femur in an urban population. *Acta Orthop Scand* 1964;(suppl 65): 26-50.

³ Brocklehurst JC, Exton-Smith AN, Barber SML, Hunt LP, Palmer MK. Fracture of the femur in old age: a two-centre study of associated clinical factors and the cause of the fall. *Age Ageing* 1978; 7:7-15.

⁴ Sheldon JH. On the natural history of falls in old age. *Br Med J* 1960;iii:1685-90.

⁵ Prudham D, Evans JG. Factors associated with falls in the elderly: a community study. *Age Ageing* 1981;10:141-6.

⁶ Wild D, Nayak USL, Isaacs B. How dangerous are falls in old people at home? *Br Med J* 1981;282: 266-8.

SIR,—Dr J M Aitken's report was both timely and important, but his results and conclusions might be misinterpreted.

The shortcomings of metacarpal morphometry for assessing skeletal mass have been outlined by Doyle.¹ The use of 25 year old data as controls is however, most inappropriate, particularly as the pattern of femoral neck fractures and perhaps osteoporosis is changing.²

Dr Aitken implies that 84% of his patients could have been osteoporotic. But osteoporosis cannot necessarily be excluded in the remainder since metacarpal morphometry for assessing skeletal mass is insensitive. Certainly bone mass is appreciably reduced in postmenopausal women with hip fractures of any type when more accurate techniques such as photon absorptiometry are used for assessment.³ Case controlled studies suggest that the incidence of unspecified fractures of the proximal femur is related to lack of oestrogen.⁴⁻⁶ Future studies will tell us whether hormone replacement treatment with oestrogen/progestin can prevent all femoral neck fractures.⁷

Until then we hope that hormone replacement treatment will continue to be used for prevention of osteoporotic fractures since it is a safe and efficient treatment with no suitable alternative.^{8,9}

JOHN C STEVENSON

Endocrine Unit,
Royal Postgraduate Medical School,
London W12 0HS

MALCOLM I WHITEHEAD

Academic Department of Gynaecology,
King's College Hospital Medical School,
London SE5 8RX

¹ Doyle FH. Involutional osteoporosis. In: MacIntyre I, ed. *Clinics in endocrinology and metabolism*. London: Saunders, 1972:143-67.

² Lewis AF. Fracture of neck of the femur: changing incidence. *Br Med J* 1981;283:1217-20.

³ Jensen GF, Christiansen C, Boesen J, Hegedus V, Transbol I. Epidemiology of postmenopausal spinal and long bone fractures. *Clin Orthop* 1982; 166:75-81.