some diabetes centres are available for patients with special problems and complications.

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1 Howitt AJ, Cheales NA. Diabetes registers: a grassroots approach. *BMJ* 1993;307:1046-8. (23 October.)

Deregulating emergency contraception

The alternative may be unwanted pregnancies

EDITOR,—Lawrence Mascarenhas's response¹ to James Owen Drife's editorial repeats some of the many oft quoted fallacies about emergency contraception.

Firstly, there is no evidence that the "Yuzpe" regimen carries a risk of ectopic pregnancy. Only one case has been reported in the world literature; this was in a woman who had established tubal disease.² The story probably derives from people's concern when the old method of giving 5 mg ethinylloestradiol for five days was used, but it has no place with current practice in Britain.

Secondly, there is not even a theoretical risk of teratogenesis as at the very early stages of development cells are totipotent; if a few die they are replaced by others, which are still totipotent. If many are affected pregnancy cannot be established.³ The Faculty of Family Planning and Reproductive Health Care is collecting details of pregnancies that go to term despite the Yuzpe regimen being used and confirms that the rate of congenital abnormalities is not increased above the background rate. Anyone who knows of such a case should inform the faculty, care of the Royal College of Obstetricians and Gynaecologists.

Thirdly, there is no evidence of changes in clotting factors after use of the Yuzpe regimen,⁴ which, after all, is only six days' worth of low dose pills. In a woman in whom there is a strong suspicion of an inherited clotting abnormality I suggest, however, that an intrauterine device should be used as the first choice of emergency contraception.

Fourthly, I wish to correct a common mistake made by Drife. Although 2-3% of women are expected to become pregnant after they take oral emergency contraception this does not mean that such contraception is 98% effective as many of the women would not have become pregnant anyway. It is difficult to calculate how many pregnancies are avoided, but the best estimate is that the Yuzpe regimen is 75% effective.⁵

The most recent guidelines on emergency contraception were published in the *British Journal of Family Planning* in 1992 and are obtainable from the faculty.

Availability of emergency contraception over the counter should be in addition to, not instead of, availability from medical services. There is also a need to train pharmacists, make sure they can provide privacy for questions, and make the package inserts clear.

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Family planning nurses have useful skills

EDITOR,—One factor that seems to have been overlooked in the discussion on deregulating emergency contraception is the skill of well trained and experienced family planning nurses.^{1,2} Such nurses can not only provide an emergency contraceptive service but take on issues relating to continuing contraceptive and sexual health needs of clients. They are experienced counsellors with excellent communication skills and are often under-used in their role as assistants in medical sessions.

In the family planning service in Liverpool recent reorganisation has resulted in nurses being used to improve access to contraceptive services. A city centre clinic has been established, which provides open access throughout the day (9 am to 7 pm). During this time a family planning nurse is available for advice, to perform pregnancy tests, and to provide emergency contraception. As medical sessions take place all day Monday and on weekday evenings and Saturday afternoon the family planning nurse can supply emergency contraception outside these sessions. She is supported by an agreed service protocol and telephone contact with a senior in the service.

Similar centralisation of family planning services was recommended recently by the chairman of the education and training committee of the Faculty of Family Planning to address training needs in the specialty.³ Surely this can be coupled with meeting the users' needs as well. This is possible only with greater flexibility in existing family planning services, which must learn to recognise and use their nurses' skills.

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Non-redemption of prescriptions

Linked to poor consultations

EDITOR,—P H G Beardon and colleagues assessed non-redemption of prescriptions written by general practitioners.¹ Unfortunately, as the authors note, many factors are associated with non-redemption. The associations described and the authors' vignette of the patient least likely to redeem a prescription are unlikely to help general practitioners attempting to minimise non-compliance. Research is needed that attempts to explain why patients fail to redeem prescriptions.

This question was perhaps partly answered by an observational study in which a large number of general practice consultations were observed and interviews conducted with the patients soon afterwards.² The study suggested that a patient is least likely to accept a general practitioner's treatment plan if in the consultation the general practitioner neglected to explore the patient's concepts of the causation and correct treatment of his or her illness. Open conflict was not required for a patient

to reject a general practitioner's treatment plan but merely a failure on the general practitioner's part to explain himself or herself in terms relevant to the patient's health beliefs. This link between non-compliance and dysfunctional consultations has also been noted by American writers.³

Given the complexity of both consultations and human behaviour, it is not surprising that Beardon and colleagues showed almost meaningless associations between patients' characteristics and primary non-compliance. In ignoring what occurred in the consultation before each prescription was issued they failed to examine the point at which non-compliance was probably determined.

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1 Beardon PHG, McGilchrist MM, McKendrick AD, McDevitt DG, MacDonald TM. Primary non-compliance with prescribed medication in primary care. *BMJ* 1993;307:846-8. (2 October.)

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Homeless people miss out on prescribed treatment

EDITOR,—In early 1993 I studied 49 consecutive prescriptions (of which I had written 45) issued from the King Square medical project six months previously. This project provides part time general practitioner care for homeless people in Bristol. Data were returned to me by the Prescription Pricing Authority.

Twenty eight forms had not been redeemed. I identified the notes relating to 21. These 21 contained 26 items and had been issued to 20 patients (all men). In eight cases the patient had specifically requested the item prescribed—for example, two patients had requested inhalers for asthma to replace an inhaler that had run out or been lost and one had requested an antiparkinsonian drug to counteract side effects of depot phenothiazines. Three patients had requested a psychoactive drug (temazepam, nitrazepam); these requests had been declined because of the potential for misuse, and a prescription had been given for a drug for a different medical problem presented. In these cases the patient's chief interest in the consultation had probably been to gain a prescription for a drug that could be misused.

As P H G Beardon and colleagues reported recently,¹ and as others have done previously,^{2,3} most of the prescriptions that were not redeemed were for drugs for symptomatic conditions or repeat items. In three identified cases the non-compliance could have had important consequences: one patient had been prescribed prednisone and chloramphenicol eye ointment for newly diagnosed Bell's palsy, and two had been prescribed ulcer healing drugs.

Does the high rate of non-redemption reflect lack of confidence in the health service? Did patients encounter problems in the pharmacy over exemption from charges (some people at the margins of society do not claim any social security benefit and therefore may not fall into any exemption category)? Is non-redemption an expression of chaotic living? Because many homeless people are mobile I could not interview the patients in this study to ask why they had not cashed their prescription. Anyway, they might not have been able to remember why six months after the event. A survey will be conducted among present patients to answer some of these questions.

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Lp(a) lipoprotein and impaired glucose tolerance

Association poorly investigated

EDITOR,—M Farrer and colleagues recently investigated the association between impaired glucose tolerance and Lp(a) lipoprotein concentration in relation to coronary artery disease.¹ Although the subject was reasonable to investigate, we were disturbed by the statistical methods they used and by the conclusions they drew. In particular, the study design did not directly address the specific objective of assessing the relation between glucose tolerance and raised Lp(a) lipoprotein concentrations in subjects with coronary artery disease. We wonder why they included a group of 517 apparently healthy subjects. We are concerned that the majority of subjects were lost because of the matching of cases and controls, resulting in a primary analysis of some 39 asymptomatic subjects and 102 patients whose representation of the target population was questionable when selection bias is taken into account. Furthermore, the use of *t* tests and analyses of variance to analyse the data assumes a causal relation between the factors, which is not the same as the hypothesis of an association. We suggest that it would have been more appropriate to compute and test Pearson's correlation coefficient for all subjects to assess the association of interest without matching subjects or assuming a specific relation.

Further issues include the use of a geometric mean rather than a more common statistic to summarise the transformed variables. Farrer and colleagues state that the study had 95% power to detect an effect in subjects with coronary artery disease (without specifying the size of the effect), implying that an effect rather than an association was the objective. In addition, since 23% of asymptomatic subjects with normal glucose tolerance had high concentrations of Lp(a) lipoprotein the power to detect a fivefold higher prevalence was not meaningful. Finally, even with the appropriate statistics and more confident data, retrospective case-control studies such as this should at best generate hypotheses: they should not be the basis on which to draw definitive conclusions.

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- 1 Farrer M, Game FL, Albers CJ, Neil HAW, Winocour PH, Laker MF, et al. Association between impaired glucose tolerance and circulating concentration of Lp(a) lipoprotein in relation to coronary heart disease. *BMJ* 1993;307:832-6. (2 October.)

Authors' reply

EDITOR,—Andrew C G Uprichard and Linda Shurzinske are correct to point out potential limitations in epidemiological studies of performing analyses that were not prospectively identified when subjects were recruited. The information from such analyses in the Framingham study and others shows, however, that their argument should not deter epidemiologists when the population(s) studied can provide useful insights into testing as well as generating hypotheses.

Our study was in response to a previous study of subjects with no known coronary artery disease which found a fivefold increase in the proportion

of subjects with impaired glucose tolerance who had concentrations of Lp(a) lipoprotein above 300 mg/l (25% of those with impaired glucose tolerance v 5% of those with normal glucose tolerance).¹ The null hypothesis was that impaired glucose tolerance was not associated with high concentrations of Lp(a) lipoprotein (as a postulated mechanism for the association between impaired glucose tolerance and coronary artery disease in British studies).^{2,3} The size of the effect observed by Davies *et al* would be clinically important and we therefore examined this hypothesis in our study populations. In patients with established coronary artery disease, however, high Lp(a) lipoprotein concentrations could theoretically be caused by atherosclerotic disease rather than be a cause of atherosclerosis. If the high concentrations were caused by the disease the effect of impaired glucose tolerance may be overwhelmed by it. A control group free of coronary artery disease was therefore essential. It also allowed the hypothesis of Davies *et al* to be tested in a similar population to theirs.

We showed that the population samples used are representative, and far from losing data we have analysed all subjects as well as subgroups, appropriately selected to test the size of effect suggested by Davies *et al* with the stated power. We showed that subgroups of impaired glucose tolerance had the expected characteristics with respect to the metabolic syndrome (syndrome X) but no difference in Lp(a) lipoprotein concentration. The prevalence of high Lp(a) lipoprotein concentrations (>300 mg/l) in subjects with normal glucose tolerance was 23% in our study of 504 asymptomatic subjects compared with 5% of 36 subjects studied previously. This finding leads to the different conclusions from the two studies.

We used geometric means because Lp(a) lipoprotein concentration is highly positively skewed and log transformation normalised the distribution. The use of parametric statistics to examine differences between geometric mean values is therefore appropriate for the stated hypothesis testing. Two paragraphs are devoted to Pearson correlation coefficient data, but we were concerned that there might be a threshold effect (analogous to the relation between microangiopathy and diabetes mellitus but not impaired glucose tolerance), and this has also been sought. To show a lack of association with certainty is difficult, but in our study the null hypothesis stands; if a real association has been missed we suggest that it is small and unlikely to be important.

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Potassium depletion and rhabdomyolysis

EDITOR,—In his report of rhabdomyolysis complicating the diabetic hyperosmolar state G M Lord discusses the possible causes of muscle cell injury and concludes that hypophosphataemia, though relevant, is insufficient by itself to cause rhabdomyolysis.¹ Deficiency of total body potassium—a frequent complication of hyperosmolar and hyperglycaemic states—may also be implicated in the pathogenesis of rhabdomyolysis; it has been suspected in diabetic patients with rhabdomyolysis and hyperosmolality.

Further evidence for the pathogenetic relevance of potassium depletion comes from occasional reports of rhabdomyolysis complicating hypernatraemic hyperosmolar states in non-diabetic patients.^{2,5} Tuller reported inappropriate urinary loss of potassium and phosphate in patients who did not develop oliguria;² Ulvila and Nesson pointed out the similarities of myoglobinuria due to potassium depletion and that due to hypernatraemia;³ and two of the children reported on by Opas *et al* were hypokalaemic at presentation,⁴ as was the patient of Bateman *et al* with probable lithium induced nephrogenic diabetes insipidus.⁵ Concurrently, low phosphate concentrations were also found in some of these patients.^{2,5}

Hypokalaemia, like hypophosphataemia, has been shown experimentally to reduce muscle cell transmembrane voltage (as predicted by the Nernst equation) and to cause muscle cell damage. Hence a combination of hypokalaemia and hypophosphataemia, although often masked by muscle cell lysis, may be the key biochemical derangement leading to muscle cell injury in hyperosmolar states.

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Imaging methods used in aortic dissection

EDITOR,—In the second of their articles on chest radiographs in emergency radiology D W Hodgkinson and colleagues state that the diagnosis of aortic dissection depends ultimately on arteriography.¹ This traditional view has become outdated with the introduction of quicker, less invasive methods that provide more detailed images. These include transoesophageal echocardiography, computed tomography, and magnetic resonance imaging. Arteriography is slow and invasive, carries considerable risk, and may be non-diagnostic.²

The optimal imaging technique has been the subject of much interest recently.^{3,5} The plain radiographic signs are non-specific and unreliable. The most impressive of the modern imaging techniques for diagnosing either acute or chronic dissection is magnetic resonance imaging.⁴ Its accuracy in diagnosis and in defining the morphological and haemodynamic features of the aortic dissection is unsurpassed.⁵ However, its limited availability, the fact that it cannot be used at the bedside, and the time that it takes make it inappropriate for use in acute cases. Transoeso-