common in the younger patients and that the distribution of the various virus infections corresponded to expectations with respect to age. Our range of testing was limited, and many common virus infections—for instance, ECHO virus, parainfluenza virus, and so on—would have gone undetected. Our incidence of 30·4% is, therefore, almost certainly an underestimate.

Both the incidence and the density of *S aureus* carriage in the nasopharynx increase dramatically during viral upper respiratory tract infections.[4] We believe that this, taken with the temporary suppression of host defence mechanisms during acute virus infections,[3] may explain many cases of *S aureus* septicaemia and endocarditis of apparently spontaneous onset. Confirmation of these findings would suggest vaccination, where feasible, against common virus infections for patients with valvular heart disease, especially when young or after heart surgery.

We thank Dr A A Codd and his staff at the Newcastle Regional Public Health Laboratory for the results of some of the virological tests.

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Respiratory depression after alfentanil infusion

SIR,—The report by Dr P S Sebel and colleagues (8 December, p 1581) on two cases of sudden and unexpected respiratory arrest advises that when alfentanil infusions are used as with other opioids respiration should be monitored very closely in the postoperative period. The authors also suggest that decreasing levels of stimulation after operation and the age of one of the patients may have been contributing factors. We write to support the authors' recommendation and to add further information and advice on the use of this new analgesic by infusion.

Alfentanil infusion rates of more than 1 μg/kg min during maintenance of anaesthesia have been associated with prolonged recovery and, in one other reported incident, with respiratory arrest 40 minutes after admission to the recovery room.[2] Providing an adequate loading dose of alfentanil is given at induction,[3] we would suggest that maintenance infusion rates of over 1 μg/kg/min are rarely needed even for major (other than cardiac) surgery, and that anaesthetists using alfentanil by infusion should titrate a rate below this value to individual patient response. Continual reduction of the maintenance infusion rate will reduce the possibility of overdosing, which often happens in clinical trials, when a rigid protocol does not allow for changing infusion rates. When signs of lightening of analgesia are seen additional boluses of alfentanil or use of inhalational supplementation is preferred to increasing the maintenance infusion rate.

Both the loading dose and infusion rate should be reduced by up to one third in elderly patients owing to a prolonged elimination half life and reduced clearance of alfentanil in this age group.[4] As Dr Sebel and his colleagues point out, one of their patients (who received a bolus of 100 μg/kg and an infusion of 1 μg/kg/min) was aged 72 years, and a reduced clearance in this patient may have contributed to his poor respiratory performance postoperatively.

Finally, we want to draw the attention of anaesthetists to the "precautions" section of the alfentanil data sheet, which warns of the possibility of respiratory depression persisting into or recurring in the early postoperative period and notes that other factors such as preoperative hyperventilation and the use of opioid premedication may enhance or prolong the respiratory depressant effects of alfentanil.

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SIR,—Dr P S Sebel and his colleagues have described two cases of respiratory arrest occurring in the postoperative recovery period in patients in whom an alfentanil infusion had been administered. Although we are told that respiratory depression occurred at 15 and 13 minutes after extubation, it is not possible from the reports to determine how long after each patient had been left in the recovery ward the event occurred. Many anaesthetists feel that a degree of analgesia is desirable at the end of surgery and are familiar with the problem of the occasional postoperative patient under the influence of narcotics who breathes inadequately if not stimulated. One of the functions of the recovery ward is to enable optimisation of analgesia during recovery; consequently the staff are trained to be aware of and to treat narcotic respiratory depression.

The authors have not attempted to explain why uncomplicated respiratory depression in case 1 led to cardiac arrest.

Alfentanil is an opioid analgesic with minimal anaesthetic properties. Respiratory depression is a dose related side effect of the drug. It would have been interesting to know on what criteria the authors adjusted the infusion rates for the two patients, as it would appear that the respiratory depression observed could have been explained by simple drug overdosage.

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Morbidity and mortality of car occupants: uses of the injury severity score

SIR,—In a recent paper (1 December, p 1525) Miss M S Christian described a substantial and interesting survey of the effects of the seat belt law on the severity of injury suffered by car occupants. During every month of the first year after the law came into force injuries were less severe than during the same month of the preceding year. While there is no reason to quarrel with this general conclusion, there are certain features of the statistical analysis that are open to criticism.

The overall severity of injury within each group was measured by the group mean value of the injury severity score.[1] This is an inappropriate use of the injury severity scale and can be misleading. An alternative procedure could have used the score to provide an acceptable statistical treatment.

Although a very sophisticated one, the injury severity score is only a ranking scale, and not integral values, such as the averages in this survey have no precise meaning. In comparing large groups, like the annual intakes of over 1000, mean values can give a qualitative indication of trend; but they may give very distorted impressions of smaller groups, owing to the skewness of the distribution of the injury severity score. Skewness arises because there are usually more patients with minor (score < 5) than with moderate injuries (5-12), and many more than with severe injuries (> 12). Thus in the year after the Act only 3·4% were severely injured. These few patients, however, were enough to raise the mean score from 1·4 to 2·17. In the corresponding monthly intakes of about 100 the number of severely injured could well have ranged from 0 to about 9, and the values of the group means would have been largely controlled by the chance incidence of a few major accidents. This, of course, is only another example of the general rule that the mean value is not a useful index of a highly skewed population.

For a different reason the median is also unlikely to be useful. Because minor and moderate injuries tend to be confined to a single body region as defined for the purposes of scoring, the most common values are 1, 4, and 9, and typically at least 75% of patients with scores of less than 13 will have one of these values. Consequently there is a tendency for groups that are dissimilar to have the same median, with 4 a particularly likely value.

The injury severity score can, however, be used to characterise cells for the χ^2 test either by single values or by ranges according to the numbers in the groups to be compared. For the monthly intakes in this survey suitable cells might have been those with scores of 1 and 2, 3 and 4, 5-10, and 11-10. It would be interesting to see how the comparisons made qualitatively before stood up to this more rigorous test.

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1 American Association for Automotive Medicine. *The abbreviated injuries scale, 1980 revision*. Illinois: AAAM, 1980.

Admission to medical school

SIR,—Your correspondents have raised several issues concerning our audit of medical students' admission on which we would like to comment.

Dr Robin Murray (1 December, p 1535) suggests that we do not pay enough attention to the social class of applicants and that the apparent fairness of selection is itself paradoxical, since the group of applicants is so atypical of the population at large. That the social class origins of doctors are very different from those of patients is beyond doubt, and one of us has argued that not all of this difference can be explained in terms of class differences in intelligence, although most can be.[1] However, the logic that doctors must be as similar as possible to patients in their personal characteristics is dubious; a moment's consideration of this in relation to mental handicap, geriatrics, paediatrics, or terminal care will show the fallacy of the argument.

o our knowledge no study has shown that the attitudes, practice, or behaviour of doctors is correlated with their social origins; indeed, Dr Murray's own study, which he cites, could find no evidence for such an effect either.[2] While there are excellent reasons why adequately qualified applicants from all sections of society should be encouraged to apply to medical schools, there is at present no compelling case for positive discrimination in favour of applicants from certain classes.

Dr Sunil Shaunak (p 1535) asks whether there was evidence in our data for racial discrimination. The UCCA application form includes nationality but does not give details of race, creed, or colour, circumstances which we do not take into account in our selection procedure and about which our questionnaire did not ask. It is difficult to phrase such questions in an acceptable way. In addition we were not entirely satisfied with assessment based on surnames, since this can produce false negatives; in particular, those of West Indian descent often have typically British surnames. Nevertheless, in view of a recent report on the unpublished work of Collier and Burke, who examined Afro-Asian and Arabic surnames among London medical graduates,[3] one of us (ICM) has classified the surnames in our study in a similar way.

Of 1361 applicants to St Mary's, 1043 (77%) had typical British surnames, 56 (4%) had other European surnames, 24 (2%) had African surnames, 41 (3%) had Arabic surnames, 99 (7%) had surnames from the Indian subcontinent, 56 (4%) had names typical of the Far East, and 42 (3%) had otherwise unidentifiable non-European names. Thus 81% of applicants had European surnames and 19% had non-European surnames. Fifty per cent of those with non-European surnames did not hold British nationality, as opposed to 4·4% of these with European surnames ($p < 0·001$). Of 348 applicants for whom photographs were available, 71% of the 31 with non-European surnames were non-white compared with 2% of the 317 with European surnames ($p < 0·001$). Of those admitted to London medical schools 12·7% had non-European surnames, a figure similar to the reported findings of Collier and Burke.

Among UK nationals who had included St Mary's among their choices 42% of the 1051 with European surnames were admitted to a British medical school, compared with 31% of the 132 with non-European surnames ($\chi^2 = 6·22$, $p < 0·025$; relative likelihood for non-European surnames compared with European surnames = 0·608; 95% confidence limits = 0·415-0·903). Among non-UK nationals the converse was found: 20% of 130 applicants with non-European surnames were accepted compared with 6·3% of 48 applicants with European surnames ($\chi^2 = 5·27$, $p < 0·05$).

Among the UK nationals those with non-European surnames differed from those with European surnames in that they had fewer O levels ($p < 0·01$), lower O level grades ($p < 0·05$), had applied later to UCCA ($p < 0·10$), were more likely to have taken A level maths ($p < 0·10$) and less likely to have taken A level biology ($p < 0·10$), were less likely to have attended private sector schools ($p < 0·01$), came from schools sending fewer students to university ($p < 0·005$), were less likely to be women ($p < 0·01$), were of lower social class ($p < 0·10$), and had used more bracketing on the UCCA form ($p < 0·10$).

The lower admission rate of UK applicants with non-European surnames could not adequately be explained in terms of differences in A level achievement and date of UCCA application (relative likelihood adjusted by multiple logistic regression = 0·584; 95% confidence limits = 0·340-1·003), and the addition of O level achievement did not substantially alter the size of the effect (relative likelihood = 0·616, 95% limits = 0·348-1·090).

Examination of the three Varimax factors derived from the judgments made during shortlisting[1] showed that applicants with non-European names did not differ from those with European names in the assessment of academic ability ($p = 0·891$) but were rated significantly lower on interests ($p < < 0·001$) and on contribution to the community ($p = 0·011$). In consequence a smaller proportion of those with non-European names was interviewed (11·2% *v* 30%). Interviewees with non-European names were assessed as of equivalent academic suitability ($p = 0·066$) and health ($p = 0·44$) to those with European names but were rated significantly lower on non-academic suitability ($p = 0·033$). They were also reported as being less anxious on a measure of state anxiety[5] ($p = 0·028$) and had higher scores on the social acquiescence or "lie" scale of the Eysenck personality questionnaire[6] ($p = 0·023$) but not on the extraversion, neuroticism, or psychoticism scales. Analysis of social, ethical, and political attitudes suggested that interviewees with non-European names had higher scores on measures of social tough mindedness ($p = 0·016$) and on economic conservatism ($p = 0·011$).

Inclusion of the shortlisting ratings of interests and contribution to community as well as O and A level achievement and date of UCCA application produced a substantial reduction in the effect of surnames on overall likelihood of acceptance (adjusted relative likelihood = 0·829, 95% confidence limits = 0·459-1·497).

In summary, in 1981 British applicants with non-European surnames had a lower probability of acceptance at UK medical schools, which cannot be explained in terms of academic achievement or delay in application but is a consequence of having a greater chance of being assessed, both from UCCA forms and at interview, as being less suitable on non-academic grounds.

Medical schools select their entrants on both academic and non-academic characteristics of applicants. There is a strong demand both from the applicants in our survey[7] and from other surveys[8 9] for selection to be based on broader criteria than just academic success. A consequence of such demands is that applicants from particular backgrounds may, on aggregate, be found to be less suitable than those from other backgrounds. Such differences might be regarded as acceptable if they are based on judgments of the particular personal qualities of each applicant considered as an individual and therefore reflecting the demands of society to select the most broadly suitable applicants from those who apply. They would not be acceptable if the judgments were a global response to the applicant's background, rather than to the candidate as an individual. On the basis of the present survey it is not possible to distinguish these two possibilities, and further research is required.

If, however, society feels that the diminished likelihood of entry of some groups is of sufficient concern to mean that selection should be based entirely on academic achievement, then it must also accept the consequences of that decision, which are that candidates currently regarded in open competition as less suitable for admission would be admitted, and that candidates in general would feel that selection was not based on the wider principles of natural justice, which include selection based on assessments of personal qualities as well as of academic ability.

Details of the full analysis are available from the authors.

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Fine bore enteral feeding and pulmonary aspiration

SIR,—The paper by Dr Michael J Boscoe a Mr Michael D Rosin (24 November, p 142 draws attention to a complication of fine bo tube feeding that should be more wide known. I can cite two further cases that illu trate an even greater danger than they e countered, when not only the feed but also t tube itself entered the trachea. The position both fine bore tubes was confirmed by auscu tation and radiography. In both cases after period of uneventful feeding signs and sym toms of massive pulmonary contaminati preceded discovery that the tube had pass through the larynx. Both patients must ha coughed or retched the fine bore tube up in the pharynx and from there inhaled it. T debility of both the patients prevented insta recognition of the mishap. Before using a wid bore tube the advantages—the practicabili of removing fluid from the stomach and t lower chance of food entering the lungs—mu be set against the disadvantages—compromi ing the cardiac sphincter mechanism, stimul tion of gastric reflux, and poorer toleration b the patient. A knowledge of and more rea suspicion of the possibility of this complic tion and the testing before each feed by auscu tation of the injection of several millilitres water and air down the tube will help to pr vent this serious mishap occurring to the mo seriously debilitated patients.

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General practice audit of asthma in childhood

SIR,—We read with interest the letter fro Drs T P Usherwood and J H Barber (December, p 1623) commenting on our aud of asthma in general practice. In their stud Drs Usherwood and Barber found that out 1079 children aged 18 months to 15 years 4 had asthma. This gives a prevalence of 4·4% as opposed to 11% in our study. Recent wor has suggested that a figure of 10-12% probably a more accurate reflection of th prevalence of the disease.[1] This raises the que tion whether there were some undiagnose asthmatics in the Glasgow study.

Drs Usherwood and Barber found no sign ficant difference in consulting rates, or trea ment given, between a group of asthmat children before diagnosis and matched co