Radiologists, who every year scan hundreds of livers of all shapes, positions, and sizes, are better placed than anyone else to comment on the inappropriateness of performing blind right intercostal punctures with large calibre needles. They are also, by training and experience, the most expert in placing biopsy needles of all kinds under imaging guidance and are probably just waiting to be asked.

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1 Vautier G, Scott B, Jenkins D. Liver biopsy: blind or guided?
BMJ 1994;309:1455-6. (3 December.)

Most are performed by radiologists

EDITOR,—Guy Vautier and colleagues' editorial finishes with the totally unsubstantiated assertion that the "ideal liver biopsy is one that is performed on the ward by the gastroenterologist using ultrasound guidance." In Britain most biopsies of the liver (and other organs) for focal disease are successfully performed by radiologists in the radiology department. The radiologist selects the most appropriate imaging technique for the patient and lesion, usually either ultrasonography or computed tomography. Radiologists have the advantage of familiarity with the imaging equipment and the cross sectional display of anatomy. The patient is accompanied by a nurse, who escorts him or her back to the ward; therefore patients are not left "without being observed during the time when at least 60% of complications occur."

The editorial does not state who performed the liver biopsies in the studies quoted or the type of biopsy needle used. We routinely use a Biopty gun (or equivalent), a spring loaded automated device that produces clean, relatively atraumatic tissue samples. We consider it to be a definite advance on the technique that uses a Menghini needle. Further radiological refinements involve the application of angiographic skills either to embolise the track of the percutaneous liver biopsy needle or to obtain a transjugular liver biopsy specimen to minimise the risk of haemorrhage in those in whom biopsy is imperative but coagulation appreciably impaired.

Although the liver is large, its position varies considerably among patients and can alter by 5 cm or more with deep respiration. If the liver is not localised ultrasonographically before biopsy it may be missed completely; this is in addition to the problem of inadvertent puncture of gall bladder or portal vein. Therefore imaging guidance is of value in diffuse as well as focal disease.

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Day case procedure is safe

EDITOR,—Guy Vautier and colleagues discuss the cost and convenience of guided liver biopsy.¹ When these two aspects are considered an additional important question is whether percutaneous liver biopsy should be performed as an inpatient or a day case procedure. The national audit of liver biopsies in 1991 indicated that fewer than 5% were performed as day case procedures.² Why are British gastroenterologists and general physicians reluctant to perform day case biopsies when studies from the United States indicate that

they are safe?³ The most likely reason remains fear of complications after discharge.

Since 1989 we have undertaken 182 liver biopsies as a day case procedure in selected patients, according to criteria based on the American guidelines.⁴ Five patients developed complications, but these were directly attributable to the procedure in only three. Four patients required admission (two with delirium tremens and two with abdominal pain), and all were discharged the next day with no serious complications. One patient returned to hospital three days after biopsy with pleuritic pain due to a pneumothorax. Twenty four consecutive patients who had been treated as day cases completed a questionnaire. Twenty two indicated a preference for the day case procedure while two would have preferred to be treated as inpatients because they were anxious about possible complications.

Our experience suggests that day case liver biopsy in selected patients is safe and associated with a high degree of satisfaction among patients. This is similar to the findings of previous American studies⁵ and indicates that the criteria used to select patients are good predictors of a low complication rate. Investigators have previously observed that complications, particularly haemorrhage, after liver biopsy most often occur within the first four hours.³ Complications rarely occur after this, though case reports exist of haemorrhage occurring 14 days after biopsy.⁵

Increasing the use of day case procedures is an important aspect of improving convenience for patients and the cost effectiveness of health care. The disparity between the current low national rate of day case liver biopsy and our own and American practice suggests that the use of day case liver biopsy could be considerably increased in Britain, with the potential for large cost savings.

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- 1 Vautier G, Scott B, Jenkins D. Liver biopsy: blind or guided? *BMJ* 1994;309:1455-6. (3 December.)
- 2 Gilmore IT, Burroughs A, Murray-Lyon IM, Williams R, Jenkins D. Indications, methods, and outcome of percutaneous liver biopsy in England and Wales. An audit by the British Society of Gastroenterology and Royal College of Physicians (London). *Gut* (in press).
- 3 Garcia-Tsao G, Boyer JL. Outpatient liver biopsy: how safe is it? *Ann Intern Med* 1993;118:150-3.
- 4 Jacobs WH, Goldberg SB. Statement on outpatient percutaneous liver biopsy. *Dig Dis Sci* 1989;34:322-3.
- 5 Reichert CM, Weisenthal LM, Klein HG. Delayed haemorrhage after percutaneous liver biopsy. *J Clin Gastroenterol* 1983;5:263-6.

Handedness among surgeons

EDITOR,—Like John P Aggleton and colleagues,¹ we are interested in handedness, but in the context of its possible importance in influencing a doctor's choice of career. To investigate this we assessed the prevalence of left handedness in cohorts of physicians and surgeons.

Two hundred and nine clinicians of register grade and above were sent questionnaires asking whether they were left or right handed. Responses were received from 103: 67 physicians (47 men) and 36 surgeons (27 men). This represented a response rate of 51% by physicians and of 50% by surgeons. When the responses were analysed by grade the response rate was 47% (24/51) for registrars compared with 77% (30/39) and 42% (48/114) for senior registrars and consultants respectively (questionnaires sent to five staff grade doctors or clinical assistants were excluded because we were unsure how to classify them). None of the surgeons was left handed, compared with eight (12%) of the physicians. This difference in the

frequency of left handedness between the groups (χ^2 test, $P < 0.05$; 95% confidence interval 2.0% to 21.8%) could not be accounted for by the unequal ratios of men to women in the groups.

To our knowledge, this is the first report of a difference in the frequency of left handedness between surgeons and physicians. The absence of left handed surgeons might suggest that left handers are less capable than right handers at manual skills pertinent to surgery. In a study of surgical residents, however, Schueneman *et al* reported that left handers were more proficient than right handers in a neuropsychological test of tactile-spatial abilities; high scores in this test correlated positively with rated operative skill in the left handed group.² Nevertheless, in terms of surgery right handers were still judged to outperform their left handed colleagues.² These authors suggested that such assessment, usually made by right handed senior surgeons assisting residents, may reflect the difficulties encountered when the handedness of the surgeon and assistant differs. The absence of left handed surgeons in our study may partly be due to surgical training that usually requires trainees to assist right handed surgeons. This may be relevant in the selection and training of surgeons.

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1 Aggleton JP, Bland JM, Kentridge RW, Neave NJ. Handedness and longevity: archival study of cricketers. *BMJ* 1994;309:1681-4. (24-31 December.)

2 Schueneman AL, Pickleman J, Freeark RJ. Age, gender, lateral dominance and prediction of operative skill amongst general surgical residents. *Surgery* 1985;98:506-15.

Word of warning to junior ophthalmologists

EDITOR,—B Hopkinson highlights the bottleneck that has developed at entry to the ophthalmic registrar grade.¹ There are now 81 senior house officers with settled status who have the FRCOphth; fewer than 20 registrar appointments were made last year. It is no surprise that Hopkinson had nine applicants (30%) with two or more higher qualifications. Three years ago a fifth of higher surgical trainees in ophthalmology had both the MRCP and an ophthalmic fellowship (R J Aggarwal *et al*, annual congress of the Royal College of Ophthalmologists, 1992), but increasing competition has directed many more senior house officers towards research and the acquisition of higher degrees. The unpredictability of the number of specialist registrars in the future coupled with the eligibility of doctors in the European Union to apply for training posts could increase both the quantity and quality of curricula vitae when Hopkinson next shortlists people for a registrar appointment.

It is important to address the problems facing both the current and the future cohorts of senior house officers. The present bulge in the number of career senior house officers should be absorbed in such a way that neither group carries the full burden. It is inappropriate to terminate all senior house officer posts at the conclusion of existing contracts as this simply draws new recruits into an ever expanding system. Senior house officers facing the expiry of their contracts with no career opening ahead may be forced to opt for futile research as a temporising measure or may give up in exasperation. The highly specialised nature of work as an ophthalmic senior house officer is such that those with three years of experience and an ophthalmic fellowship are ill equipped to switch careers. It is unreasonable, however, to place a moratorium on the advertisement of new posts as

this unfairly penalises the next generation of potential ophthalmologists. Until a true unified training grade is established the number of career senior house officers in ophthalmology must be brought into line with the predicted number of specialist registrars. Only this will prevent capable juniors wasting immense effort and several crucial years.

Maintaining the current service commitment after such rationalisation requires a rethinking of the working practice of senior house officers, with skill mix and the employment of paramedical staff to reduce the non-medical workload and amalgamation of inpatient units where appropriate. An expansion in the number of visiting senior house officers and general practice trainees (with clearly defined objectives and appraisal) seems timely.

We have no wish to discourage potential ophthalmologists from a rewarding choice of career, but competition at the most junior level is fierce and some will be disappointed after several years of highly specialised training and examination. The Ophthalmic Trainees' Group is preparing a career information pamphlet, available on request to all those intending to become ophthalmologists.

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1 Hopkisson B. Word of warning to junior ophthalmologists. *BMJ* 1995;310:62. (7 January.)

More urologists are needed

EDITOR,—The classified advertisements supplement of 14 January contains advertisements for seven consultant posts in urology. Throughout Britain about 40 specialist urology posts are unfilled. This year 10 accredited trainees will become eligible to apply for consultant posts. The new deal for junior doctors demands a substantial increase in the number of consultants. In my segment of south east London (Greenwich, Bexley, and Bromley) 3.5 consultant urologists struggle to serve 750 000 people. When we recently advertised for a new consultant none of the applicants was accredited. Even if the number of training posts was doubled tomorrow those in them would take five years to be ready to practise.

Who then is to provide the service to the increasing number of patients with urological problems? At present only two courses of action exist: the creation of a substantial number of staff grade posts to fill the urgent shortfall in services and a recruitment drive on the Continent, led and financed by the government, for suitably trained people. The need is acute; action is necessary now.

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Assessing blood glucose control in diabetes mellitus

Use precise analytical methods

EDITOR,—In their study of the use of glycated haemoglobin concentrations to indicate glycaemic control Eric S Kilpatrick and colleagues used targets, related to the methods used, which were based on multiples of the SD of a reference range derived from non-diabetic subjects.¹ They found considerable differences in the classification of diabetic patients, which depended on the method, despite the methods giving similar absolute values for haemoglobin A₁ (HbA₁).² This, however, does

not necessarily show different measurements of glycated haemoglobin to be inherently non-comparable indicators of glycaemic control. The electrophoretic method used is much more imprecise than the high performance liquid chromatography with which it was compared.² This is relevant because the estimate of a population reference range has components of both analytical and biological variation and will be broader for a method with high variability. Therefore, a given HbA₁ measurement will be fewer multiples of the SD from the non-diabetic reference mean when the imprecise method is used. Indeed, the authors have shown exactly this point, with the results of electrophoresis indicating apparently better glycaemic control.

This effect can be minimised by using multiples of the biological SD to define target concentrations. This can be illustrated by using the authors' quoted reference ranges and estimates of the analytical variation for the two methods of measuring HbA₁.² If coefficients of variation for the analytical component are assumed to be 2.0% for high performance liquid chromatography and 8.3% for the electrophoretic method, the biological coefficients can be estimated as 7.54% and 8.53% respectively.³ These are similar, and if a mean of 8.0% is taken the biological SDs at the midpoint of the reference interval are 0.45% for high performance liquid chromatography and 0.50% for electrophoresis. If these are used to set clinical targets an HbA₁ concentration of 12.3% is 13.7 biological SD above the mean for high performance liquid chromatography and 12.0 biological SD above the mean for electrophoresis, compared with 14.0 total SD for high performance liquid chromatography but only 8.0 for electrophoresis. Therefore, targets derived from biological variation would have given a much better consensus in the classification of patients by the two methods. In practice the total SD is close to the biological SD when the analytical variation is small, as is the case with high performance liquid chromatography.^{3,4}

It is important that precise analytical methods are adopted and that bias between methods is minimised. Until this is more universally achieved, however, we suggest that target concentrations should always be defined on the basis of biological variation when the analytical imprecision is large.

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- Kilpatrick ES, Rumley AG, Dominiczak MH, Small M. Glycated haemoglobin values: problems in assessing blood glucose control in diabetes mellitus. *BMJ* 1994;309:983-6. (15 October.)
- Standing SJ, Taylor RP. Glycated haemoglobin: an assessment of high capacity liquid chromatographic and immunoassay methods. *Ann Clin Biochem* 1992;29:494-505.
- Cotlove E, Harris EK, Williams GZ. Biological and analytic components of variation in long-term studies of serum constituents in normal subjects. III. Physiological and medical implications. *Clin Chem* 1970;16:1028-32.
- Lytken Larsen M, Fraser CG, Hyltoft Petersen P. A comparison of analytical goals for haemoglobin A_{1c} assays derived using different strategies. *Ann Clin Biochem* 1991;28:272-8.

Variant haemoglobin may affect measurements

EDITOR,—We agree that Eric S Kilpatrick and colleagues' study suggests the need for greater standardisation of methods used for estimating glycated haemoglobin concentrations.¹ The estimation of glycated haemoglobin in patients with variant haemoglobins also urgently needs standardisation. An external quality assessment of the measurement of glycated haemoglobin in such patients by laboratories in the North West Thames region showed alarming discrepancies in the results obtained (C E Andrew and P Harrison,

national meeting of Association of Clinical Biochemists, 1991). For some samples the variability was so large as to alter completely the interpretation from one of very poor diabetic control to one of overcontrol likely to lead to hypoglycaemic episodes. An additional worrying finding was the varying methods used to calculate results, which partly accounted for the discrepancies. While some of the laboratories that used electrophoresis or ion exchange methods expressed haemoglobin A₁ and haemoglobin A_{1c} as a percentage of total haemoglobin—that is, haemoglobin A plus variant—others expressed their results as a percentage of the non-glycated fraction, haemoglobin A₀, or of haemoglobin A₀ plus haemoglobin A. In these circumstances comparison of results obtained with different methods from any one sample becomes meaningless.

To add to these difficulties, most ion exchange and electrophoretic methods have the problem of coelution of haemoglobin F (HbF) with glycated haemoglobin, which leads to overestimation of the latter.² Small increases in HbF are not uncommon in diabetic patients and are often unrecognised.³ Hence methods that cannot resolve HbF from glycated haemoglobin adequately are unsuitable for estimating glycated haemoglobin and should be abandoned as soon as possible.

Until we have greater standardisation and guidelines about estimating glycated haemoglobin concentrations in diabetic patients with variant haemoglobins, all patients with newly diagnosed diabetes should undergo a haemoglobinopathy screen. This should include measurement of HbF at the time of initial presentation to enable correct interpretation of results.

All laboratories should be willing to provide information about the method used to measure glycated haemoglobin, the mode of calculations of results, and interference from variant haemoglobins including HbF. Clinicians would also be well advised to ascertain necessary information about the methods used from their laboratory colleagues.

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- Kilpatrick ES, Rumley AG, Dominiczak MH, Small M. Glycated haemoglobin values: problems in assessing blood glucose control in diabetes mellitus. *BMJ* 1994;309:983-6. (15 October.)
- Yatscoff RW, Tevaarwerk JM, Clarson CL, Warnock LM. Interference of foetal haemoglobin with the measurement of glycosylated haemoglobin. *Clin Chem* 1983;29:543-5.
- Kilpatrick ES, Rumley AG, Small M, Dominiczak MH. Increased foetal haemoglobin in insulin-treated diabetes mellitus contributes to the imprecision of glycohaemoglobin measurement. *Clin Chem* 1993;39:833-5.

Like should be compared with like

EDITOR,—Eric S Kilpatrick and colleagues conclude that measurement of haemoglobin A_{1c} (HbA_{1c}) concentration is to be preferred to measurement of haemoglobin A₁ (HbA₁) concentration on the grounds that the former classified a higher proportion of diabetic patients as having poorly controlled disease.¹ But the basis of this classification—poor control being equated with a glycated haemoglobin concentration > 5 SD from the reference population mean—is flawed because the coefficient of variation of the reference population mean is not the same for the methods of measurement compared. Inevitably, if (as is the case) the SD is much smaller for HbA_{1c} than for HbA₁ measured by electrophoresis but the means differ proportionately much less, any criterion of poor control based on the same number of SDs above the mean will classify a higher proportion of the HbA_{1c} values as indicating poor control than will be the case for HbA₁ values measured by electrophoresis. In numerical terms a limit of 5 SD for HbA_{1c} (mean 4.02% (SD 0.28%)) is 5.44%, representing a 35.3% increment; whereas a limit of