characterisation, by use of tryptamine and benzamide derivatives, of the putative 5-HT₁ receptor mediating tachycardia in the pig. *Br J Pharmacol* 1991;102:107-12.

- 6 Kaumann AJ, Sanders L, Brown AM, Murray KK, Brown MJ. A 5-HT₁-like receptor in human right atrium. *Nature* *Schmidhebers Arch Pharmacol* 1991;344:150-9.

Thoracoscopic pericardiectomy

EDITOR,—In their editorial on the management of malignant pericardial effusions David Keane and Graham Jackson quote a 30 day mortality of up to 60% for open surgery in cases of malignant pericardial disease.¹ They then present the case for percutaneous balloon pericardiectomy as a non-surgical alternative. There is, however, an important alternative surgical option—namely, thoracoscopic pericardial window. Minimal access thoracic surgery done with videothoracoscopy and endoscopic instruments allows thoracic surgical procedures to be performed without the morbidity and mortality associated with thoracotomy.²

The patient is positioned as for a standard thoracotomy in the lateral position. Under general anaesthesia one 1 cm and two 0.5 cm incisions are made in the left sixth intercostal space. A thoracoscope with attached video camera is introduced through one of these, and endoshears and forceps are passed through the others. Under one lung anaesthesia the lung collapses and falls posteriorly to give an excellent view of the mediastinum. To relieve tamponade a pericardial window of suitable size and shape is cut, avoiding the phrenic nerve. Pericardial fluid is aspirated from the thorax, and an intercostal drain is inserted through the larger incision.

RICHARD G BERRISFORD
RAYMUND J DONNELLY

Cardiothoracic Centre,
Liverpool L14 3PE

- 1 Keane D, Jackson G. Managing recurrent malignant pericardial effusion. *BMJ* 1992;305:729-30. (26 September.)
2 Donnelly RJ, Page RJ, Cowen ME. Endoscopy assisted microthoracotomy: initial experience. *Thorax* 1993;47:490-3.

Measuring glycated haemoglobin

EDITOR,—Douglas A Robertson and colleagues report three cases in which haemoglobin F resulted in certain assays giving falsely high haemoglobin A₁ concentrations.¹ We recently changed from using affinity chromatography to using an in house high pressure liquid chromatography method, with an ion exchange packing material, because results from the affinity chromatography method had become unreliable. With high pressure liquid chromatography various types of haemoglobin are seen as separate peaks in a chromatogram; this technique allows haemoglobin F and other variants to be identified and measured easily.

We have analysed more than 5000 samples in nine months and have found 16 patients with haemoglobin variants. All have been heterozygous and none had been suspected to be. Two had haemoglobin F, both in much higher concentrations (26% and 22%) than those reported by Robertson and colleagues. One had haemoglobin E. Seven had haemoglobin D, a common Punjabi variant, which reflects Coventry's large Punjabi population. We believe that the five with sickle cell trait were of West Indian origin. Intriguingly, haemoglobin J was found in an Irishman; this is a rare Spanish variant.

Conventional charge dependent methods of measuring haemoglobin A₁, in which haemoglobin fractions are eluted from a column and measured colorimetrically, do not separate haemoglobin F from haemoglobin A₁ and thus overestimate it.² Conversely, falsely low values for haemoglobin A₁

are obtained when abnormal haemoglobins such as S, C, D, G, and E are present.¹ These variants are not separated from haemoglobin A by these methods, which therefore underestimate the haemoglobin A₁:haemoglobin A ratio, although Torke *et al* suggested that a correction can be made if the percentage of the variant haemoglobin is known.¹

Having changed to high pressure liquid chromatography we can now detect haemoglobin variants easily and report the haemoglobin A₁ concentration without the previous errors. We are now finding cases of sickle cell trait during routine management of diabetic patients, which could necessitate genetic counselling.

We note, incidentally, that in case 2 Robertson and colleagues do not mention the haemoglobin F concentration. We wonder whether it was measured in this case and, if so, whether the value was comparable with that in the other cases.

ANDREW WILLIS
COLIN TOBITT
SHIRLEY JONES
HUW GRIFFITHS

Biochemistry Department,
Coventry and Warwickshire Hospital,
Coventry CV1 4FH

- 1 Robertson DA, Tunbridge FKE, John WG, Home PD, Alberti KGMM. Diagnostic confusion in diabetes with persistence of fetal haemoglobin. *BMJ* 1992;305:635-7. (12 September.)
2 Paisey RB, Read R, Palmer R, Hartog M. Persistent fetal haemoglobin and falsely high glycosylated haemoglobin levels. *BMJ* 1984;289:279-80.
3 Eberentz-Lhomme C, Ducrocq R, Intrator S, Elion J, Nunez E, Assan R. Haemoglobinopathies: a pitfall in the assessment of glycosylated haemoglobin by ion-exchange chromatography. *Diabetologia* 1984;27:596-8.
4 Torke NS, Mehta PS, Vohra RM, Patel AR, Shah PC. Comparative analysis of glycosylated hemoglobins by ion-exchange column chromatography in patients with hemoglobinopathies. *Am J Clin Pathol* 1988;90:697-701.

EDITOR,—D A Robertson and colleagues point out that some widely used methods of measuring glycated haemoglobin that are charge dependent give erroneously high values for glycated haemoglobin because they include haemoglobin F.¹ But some instruments based on charge dependent separation using high pressure liquid chromatography give haemoglobin A₁ or haemoglobin A_{1c} results with minimal interference from haemoglobin F.² Moreover, one such analyser, the Diamat (Bio-Rad Laboratories, Hemel Hempstead), is suitable for measurement of haemoglobin F.¹

The authors mention the increased prevalence of slightly raised haemoglobin F concentrations in diabetic children.¹ Our observations made with a Diamat analyser confirm that these raised concentrations also occur with increased frequency in adolescent and young adult diabetic patients. Of 561 consecutive specimens from patients aged 11-25, 210 (37.4%) had haemoglobin F concentrations above the often quoted upper limit of normal of 0.5%, and 46 of these concentrations were above 1.0%. This frequency was significantly greater (χ^2 test, $p < 0.001$) than that observed in 44 control specimens taken from the non-diabetic hospital population and blood donors in the same age range, of which four (9%) had values above 0.5%, the highest being 0.8%. The increase was seen in both sexes but occurred significantly more commonly in female than male diabetic patients (χ^2 test, $p < 0.01$). In the 280 specimens from female patients the 26 values above 1.0% were from 18 patients, in 14 of whom pregnancy was excluded as a cause.

Misinterpretation may also occur during long term monitoring of high risk groups such as patients with cystic fibrosis. Where the method includes haemoglobin F its proportion is not known and the extent to which it may change over the years cannot be predicted. These estimations are frequently performed on very young children. In a series of eight children aged 3 years or under

with cystic fibrosis five had haemoglobin F concentrations in the range 1.0-2.9%.

For these reasons and those described by Robertson and colleagues we would discourage people from using methods of measuring glycated haemoglobin that include haemoglobin F. Of the non-charge dependent methods that the authors suggest, however, thiobarbituric acid and affinity chromatography methods are not readily suited to large numbers of samples and enzyme immunoassay can grossly underestimate glycated haemoglobin in patients with structural haemoglobin variants.²

SUSAN J STANDING
RICHARD P TAYLOR

Department of Clinical Biochemistry,
John Radcliffe Hospital,
Oxford OX3 9DU

- 1 Robertson DA, Tunbridge FKE, John WG, Home PD, Alberti KGMM. Diagnostic confusion in diabetes with persistence of fetal haemoglobin. *BMJ* 1992;305:635-7. (12 September.)
2 Standing SJ, Taylor RP. Glycated haemoglobin: an assessment of high capacity liquid chromatographic and immunoassay methods. *Ann Clin Biochem* 1992;29:494-505.
3 Brenna S, Prencipe L, Granata S, Montalbetti N. Assessment of an automatic liquid chromatograph for foetal and abnormal haemoglobins. *J Clin Chem Clin Biochem* 1987;25:437-40.
4 Mullis P, Schuler J, Zupping K. Increased prevalence of fetal haemoglobin in type 1 (insulin-dependent) diabetes mellitus. *Diabetologia* 1989;32:227-30.

Early analgesia for acute abdominal pain

EDITOR,—Zachary Cope's warning of the dangers of giving morphine before making a diagnosis was justifiable in 1921, when a dose of 30 mg was not unusual, but it has been heeded for too long, and the trial of Alex R Attard and colleagues (using a maximum dose of 12.5 mg morphine) is very welcome.¹

It is interesting that no inappropriate operations were performed among the 50 patients receiving papaveretum but six were performed among the 50 who received saline. It seems that some patients when first seen by the registrar, one hour after injection, were doubtful and were observed, because 10 in the papaveretum group and six in the saline group left hospital with a diagnosis of non-specific abdominal pain and had not been subjected to operation. However, six patients in the saline group must have seemed on first examination to have disease requiring surgery because a laparotomy was needed to eliminate this possibility.

Experience with the acute abdomen in infancy may be helpful here. In a frightened, uncomfortable 2 year old it can be impossible to elicit reliable abdominal signs because of struggling and crying; it is then necessary to sedate the child, most readily with rectal diazepam.² After an hour the child is usually asleep and if a warm hand is slipped under the bedclothes a good examination of the abdomen can be made without awakening the infant. Here one is seeking the objective signs of muscle guarding, a mass, or, if the appendix is far from the anterior parietal peritoneum, deep tenderness which causes the child to stir. These signs do not rely on the subjective sensations of the patient.

Most patients with non-specific abdominal pain show tenderness in the right iliac fossa, but guarding is unusual.³ One of the hidden advantages of early analgesia may be that it enables the patient to relax; it is then easier to recognise that, though there is local tenderness, there is a significant absence of guarding. It is then logical to await developments, make recordings every half hour, and re-examine the patient in two to three hours rather than proceed immediately to operation.

PETER F JONES
Aberdeen AB1 9HR

- 1 Attard AR, Corlett MJ, Kidner NJ, Leslie AP, Fraser IA. Safety