supplied by Bio-Rad Laboratories. Approximately 70-80% of the fast haemoglobin fraction measured by this technique is HbA_{1c}.² Two units of whole blood, collected in ordinary donor bags with citrate phosphate dextrose, were stored at 4°C and tested on days 1, 3, 7, 15, 21, and 28.

Storage of red cells in citrate phosphate dextrose: follow up of values of HbA_{1c}, hydrogen ion concentration, and glucose concentration

Day of storage	Mean % HbA _{1c}	Mean pH	Mean glucose concentration (mmol/l)
1	6.18	7.00	23.4
3	7.18	6.90	24.65
7	5.80	6.77	20.15
15	7.00	6.57	16.55
21	5.9	6.50	12.7
28	6.04	6.49	10.8

Conversion: SI to traditional units—Glucose: 1 mmol/l ≈ 18 mg/100 ml.

As expected, the results in the table show a drop in the mean glucose level and a gradual rise in the hydrogen ion concentration but no change in HbA_{1c} and no evidence to support instability or detectable in-vitro glycosylation, despite the elevated glucose concentration of citrate phosphate dextrose. We could also conclude that the simple mini-column technique could be used for reliable estimations of glycosylated haemoglobin in specimens stored in citrate phosphate dextrose at 4°C for up to four weeks.

G S GABRA
RUTHVEN MITCHELL

Glasgow and West of Scotland
Blood Transfusion Service,
Law Hospital,
Carlisle, Lanarkshire ML8 5ES

- ¹ Svendsen PA, Christiansen JS, Welinder B, Newp J. *Lancet* 1979;i:603.
² Trivelli LA, Ranney HM, Lai HT. *N Engl J Med* 1971;284:353.

Measuring glycosylated haemoglobin concentrations in a diabetic clinic

SIR,—Dr John Saunders and others (22 November, p 1394) make a virtue out of the provision of same-day estimation of glycosylated haemoglobin (HbA_{1c}) for their diabetic clinics. After about two years' experience of a mini-column HbA_{1c} assay service for our diabetic clinic¹ we feel that there are some snags relating to patient care that clinicians contemplating a similar approach should consider.

Firstly, a raised HbA_{1c} can be misleading if up to 3% is added on to the value by the presence of temporary glucose-HbA complexes due to short-lived hyperglycaemia.² Mini-column assays are sensitive to such temporary adducts, and we have found that the electroendosmotic technique is similarly affected and gives higher levels than the mini-column in the upper range of values (as in the figure of the present report). There is some fall in these short-lived adducts after sample storage or, better still, after washing or dialysis of the red cells.³ An assay run after suitable sample preparation is thus less likely to be misleading when the blood glucose is high at the time of sampling.

Secondly, there are no proper standards or acceptable quality control for these assays: should a run be distorted by temperature or buffer pH changes (for example, for mini-

column assays)⁴ this might not be spotted. It is to be hoped that electroendosmosis may prove more sturdy.

Thirdly, and most important, raised HbA_{1c} levels, whatever assay is used, may reflect previous poor control. Clinicians must not, therefore, give way to any temptation to increase hypoglycaemic therapy without assessing the current state of control. This is especially necessary for patients on insulin. On the other hand, falsely low levels can arise with increased red cell destruction despite poor control. Provided that these points on interpretation of HbA_{1c} values are borne in mind we feel, like Professor Sönksen and his colleagues, that access to serial monitoring of the control of diabetes by HbA_{1c} is a valuable addition to patient care whatever the system of provision that is chosen.

B J BOUCHER
S G WELCH

London Hospital and London
Hospital Medical College,
London E1 1BB

- ¹ Welch SG, Boucher BJ. *Diabetologia* 1978;14:209-11.
² Svendsen PA, Christiansen JS, Søgaard U, Welinder BS, Nerup J. *Diabetologia* 1980;19:130-6.
³ Goldstein DE, Peth SB, England JD, Hess RL, Da Costa J. *Diabetes* 1980;29:623-8.
⁴ Simon E, Eissler J. *Diabetes* 1980;29:467-79.

Treatment of axillary hyperhidrosis

SIR,—I write in reply to the claim of Mr G R Bailie and others (15 November, p 1354) that the points made in my letter to you (6 September, p 683) are imprecise. In support of this, Mr Bailie claims that aqueous dilutions of aluminium chloride hexahydrate in alcohol, and even aqueous solutions, produce at least as little irritation as the 95% alcoholic solution (Anhydrol Forte).

I would refer Mr Bailie to the original paper of Shelley and Hurley,¹ the fountainhead from which all the subsequent work derived. Hurley and Shelley compare a 25% aqueous solution with a 25% absolute alcoholic solution which they used and state: "It is irritating to the skin of some users, and its high acidity is damaging to clothing." "When water was substituted [for the alcohol] the aluminium chloride hexahydrate retained its effectiveness but proved to be irritating." "Success in the employment of the method comes only if the formulation is applied to a dry, non-sweating axilla." "It is important that the antiperspirant should not be applied to a wet axilla since this leads to irritation." Scholes *et al.*,² who carried out a properly controlled trial on 65 patients, state: "It was important that the axilla was dry before application. . . ."

What has misled Mr Bailie and his colleagues is a failure to appreciate the difference between the pH of the various solutions in the bottle and the pH of these solutions after application to the skin. It is a matter of simple physical chemistry. When an aqueous solution of aluminium chloride hexahydrate is applied to the skin (which is at 32°C), it remains there as an aqueous solution containing all the HCl formed by hydrolysis. That is why it is so acid and therefore so irritant. When an absolute alcoholic solution is applied, the solvent evaporates almost immediately and carries with it practically all the water of crystallisation (the 6H₂O present), together with most of the HCl, leaving behind the aluminium chloride and a mere trace of water/HCl, which is far less irritant.

It can be shown from the azeotropic curves of the ternary system alcohol/water/HCl at 32°C³ that the maximum amount of water which can be tolerated in the solution, without leaving any appreciable amount on the skin after evaporation, is about 5% (in addition to the water of crystallisation originally present) and, provided that this amount of water is not exceeded, the residue left

on the skin after evaporation is practically identical with that left by absolute alcohol. It is interesting to note in this connection that Scholes *et al.*² found that the lower-proof spirit (95%) could be used instead of absolute alcohol. This corresponds to the Anhydrol Forte formulation.

It is quite certain that the 90% solution containing 10% of water used by Mr Bailie will leave most of the 5% excess water on the skin after evaporation, and that this will be strongly acid. It is therefore essential, Sir, once more to warn your readers against using any solution of aluminium chloride hexahydrate of less than 95% alcoholic strength if severe irritation is to be avoided and, in particular, against using an aqueous solution. The temptation to ease the problem of the three weeks' dissolution time by a short cut, by adding water, must therefore be resisted; and I would also suggest that Mr K Gisborne's method of shortening the dissolution time⁴ (25 October, p 1146) by refluxing the alcoholic solution for an hour not only is a hazardous procedure but also would result in the esterification of some of the alcohol to form ethyl chloride and water.⁵

H YARROW

Dermal Laboratories Limited,
Hitchin, Herts SG4 7QR

- ¹ Shelley WB, Hurley HJ. *Acta Derm Venereol (Stockh)* 1975;55:241-60.
² Scholes KT, Crow KD, Ellis JP, Harman RR, Saihan EM. *Br Med J* 1978;ii:84-5.
³ Sunnier AA, Rosenbloom C. *Ind Eng Chem (Analyst ed)* 1930;2:109-13.
⁴ Gisborne K, John S. *Pharm J* 1979;223:638.
⁵ Bernthsen A. *A textbook of organic chemistry*. Glasgow: Blackie, 1946:63.

*.*This correspondence is now closed.—Ed, BMJ.

Postanal sinus

SIR,—Your leading article (11 October, p 959) on postanal sinus discusses some of the options available in managing this condition. While we would accept that some patients may not need to undergo surgery, many will need to do so. For these the balance of long-term follow-up studies suggests that careful conservative total excision leaving the wound to heal by granulation is most likely to cure the condition.

In the past, traditional methods of dealing with open wounds had a number of disadvantages. We are at present treating in excess of 150 cases of pilonidal sinus a year at the University Hospital of Wales by total conservative excision and healing by granulation using silastic foam dressing. This dressing is comfortable and easy to manage and a majority of patients are able to care for the wound and dressing themselves, obviating the need for daily district nurse visits and thereby allowing the patient to return to work before the wound has healed. The method is equally applicable to primary cases and those recurrent after other forms of management. Attention to detail is essential for rapid healing; shaving and frequent cleansing are especially important. Rarely, persistent anaerobic infection may delay healing but will respond to appropriate medication.

This form of treatment therefore allows the patient to have the most effective type of surgery with minimal inconvenience and usage of health services while the wound is healing.

K G HARDING

University Department of Surgery,
Welsh National School of Medicine,
Cardiff CF4 4XN