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Methods of Radial Artery Cannulation and Subsequent Arterial Occlusion

To the Editor:—The article by Jones *et al.*¹ on radial artery cannulation addresses an interesting practical question. Unfortunately, the design of their study does not allow them to resolve that question. Twenty-gauge Teflon® cannulae result in about a 5 per cent incidence of thrombosis.^{2,3} To detect even a doubling of this rate (a reasonable clinical yardstick) at a 5 per cent probability level would require many hundreds more than the 40 patients studied. Thus, no objective conclusion can be drawn from their short report.

In 332 cardiac surgical patients, and using a variety of cannulae, we have reported that 30 per cent of patients had complete occlusion and 12 per cent had partial occlusion of the radial artery post-decannulation.⁴ We observed a significant increase in occlusion if the artery were punctured on more than one occasion during attempted cannulation ($P < 0.01$) but no significant difference between the single wall and the transfixion techniques.

The latter data were not published and therefore are presented in table 1. In itself, even this may be criticized as the technique used was a matter of clinical chance rather than being strictly randomized.

We conclude that the choice of technique does not influence the subsequent incidence of thrombosis provided that cannulation is performed with reasonable proficiency. This supports the clinical impressions of Dr. Jones and his colleagues. By far and away the most important factor is the cannula itself. Despite the evidence available from several studies small-gauge Teflon®

TABLE 1. Incidence of Occlusion of the Radial Artery Measured by Doppler Flow-meter and Modified Allen's Test One Day Post-decannulation in 314 Patients

	Occluded	Partly Occluded	Patent
Single Wall	57	21	125
Transfixion	38	15	68

There was no difference between the two cannulation techniques ($\chi^2 = 1.13$; $P > 0.2$).

cannulae are still not used universally for percutaneous radial artery cannulation.

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Awareness during Fentanyl Anesthesia

To the Editor:—I wish to comment on several points raised in the recently published article by Sebel *et al.*¹

Premedication with lorazepam in very adequate sedative doses in 30 of 39 patients suggests that the study was in effect one of the lorazepam-fentanyl combination, and not fentanyl alone as the title indicates. Benzodiazepines have been especially useful in the prevention of recall.²

As for the nine patients who received morphine premedication before fentanyl, the small size of this sample precludes the certain identification of any cases of aware-

ness, as the incidence of this complication is, in itself, low.³

More importantly, however, the interview technique used may not have been adequate to detect awareness episodes. Most studies of awareness during anesthesia indicate that such patients are reluctant to identify themselves early³ and often will not discuss it during hospitalization, reserving the first discussion of it for a surgical follow-up visit to the surgeon's office. Some fail to consciously accept it, and instead develop psychiatric symptoms.⁴

Despite the general agreement that depressed EEG activity correlates with unconsciousness, Levinson⁵ found that similarly depressed EEG activity in his patients did not exclude frequent and traumatic recall.

Awareness episodes with fentanyl techniques are being reported frequently,⁶⁻⁹ and I agree with the authors that this study does not allow the prediction of the effects of fentanyl on recall when it is used alone. Awareness can be expected in at least 1 per cent of such cases.^{3,8}

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Continuous Insulin Infusion is Preferred Method for Managing Diabetics

To the Editor:—We would like to comment on the article written by Dr. Walts *et al.*,¹ in the the August 1981 issue of *ANESTHESIOLOGY*. Although the study was generally well-done, we thought the details of the administration of insulin were somewhat confusing. Apparently, 10 units of regular insulin were given "not more than" every two hours if the plasma glucose concentration rose above 200 mg/dl. If the plasma glucose concentration rose above 400 mg/dl, the management was considered a "failure" (which is confusing), and 20 units of regular insulin were injected intravenously. If the plasma glucose fell below 60 mg/dl, this also was considered a "failure". Thus, the details of administration, the key to the article, were too brief.

Furthermore, the author's method of intermittent bolus injections of insulin is obsolete and may have contributed to the hypoglycemia experienced by Group 3 patients. For several years continuous infusions of insulin have been used during surgery,²⁻⁴ and obstetrics⁵ (we have been using it for six months). Our method, briefly, is to administer 5 per cent glucose 125 ml/h, with potassium chloride 4 mEq/h. Blood glucose is checked every 30 min. A bolus of regular insulin, 0.05 units/kg, is given intravenously just after induction of anesthesia. A continuous infusion of insulin is adjusted as follows: if blood glucose falls below 100 mg/dl: 1 unit/h; if blood glucose exceeds 200 mg/dl: 3 units/h; and if blood glu-

cose exceeds 300 mg/dl: 4 units/h. Other adjustments are made with glucose and insulin as the blood sugar varies.

The method advocated by Dr. Walts may be superior to subcutaneous injection; however, in our experience, and that of others,^{2-4,6} control of the blood glucose can best be maintained by a constant insulin infusion with rapid glucose monitoring.

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