

Despite the general agreement that depressed EEG activity correlates with unconsciousness, Levinson<sup>5</sup> 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,<sup>6-9</sup> 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.<sup>3,8</sup>

JACOB MAINZER, JR., M.D.  
*Clinical Associate, University of New Mexico  
School of Medicine  
2605 Wyoming Boulevard NE  
Albuquerque, New Mexico 87112*

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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.*,<sup>1</sup> 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Furthermore, the author's method of intermittent bolus injections of insulin is obsolete and may have contributed to the hypoglycemia experienced by Group 3 patients.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,<sup>2-4</sup> and obstetrics<sup>5</sup> (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,<sup>2-4,6</sup> control of the blood glucose can best be maintained by a constant insulin infusion with rapid glucose monitoring.

RICHARD B. CLARK, M.D.  
*Professor  
Departments of Anesthesiology and Obstetrics-  
Gynecology*

ASTRIDE B. SEIFEN, M.D.  
*Associate Professor  
Department of Anesthesiology*

RICHARD M. JORDAN, M.D.  
*Assistant Professor  
Department of Medicine, Division of Endocrinology  
University of Arkansas for Medical Sciences  
Little Rock, Arkansas 72205*

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Anesthesiology  
56:333, 1982

*In reply:*—We are sorry for the confusion in describing our methods. To clarify, we studied insulin-taking diabetic patients in three groups. Groups 1 and 2 were followed without insulin intervention until the plasma glucose level reached 400 mg/dl. Seven patients in these two groups reached that level and were subsequently given 20 units of regular insulin intravenously. Group 3 (the titration group) was given insulin, 10 units, when the plasma glucose rose above 200 mg/dl. No patient in Group 3 reached a plasma level requiring the larger dose of insulin.

As to the method of management, both Clark *et al.* and we recommended 1) the dose of glucose be limited, 2) the level of blood glucose be monitored, and 3) rigid adherence to protocol be abandoned. Clark *et al.* may have had excellent results with iv infusion (data not given) where others have failed<sup>1</sup> because of their "other adjustments . . . as the blood sugar varied." We recommended single intravenous injections of 10 units at high plasma glucose levels as a compromise to the anesthesiologist who may have multiple distractions making the continuous infusion less desirable. If sufficient anesthesia help is at hand insulin infusions could possibly

Anesthesiology  
56:333, 1982

## An Unusual Cause of Leakage in an Anesthesia System is More Usual Than It Should Be

*To the Editor:*—It is with interest that I read the letter about an unusual cause of leakage in an anesthesia system by Wolf *et al.*<sup>1</sup> This problem was reported by myself four years ago,<sup>2</sup> and has since been detected six times in our operating rooms. Perhaps it is not so unusual after all.

I am in agreement with Wolf and co-workers that there is a major fault in design when the gas delivered by the ventilator passes through the structure used to support the ventilator. Also of concern is the fact that this problem was first reported four years ago and we are not aware of any steps the manufacturer (Narco Medical Services) may have taken to inform anesthetists

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be the better technique. The reference cited by Clark *et al.* concerning an artificial beta cell to control diabetes during surgery<sup>2</sup> will probably be the method of management in the future when such technology becomes available to all anesthesiologists.

LEONARD F. WALTERS, M.D.  
*Professor*

JORDAN MILLER, M.D.  
*Associate Professor*

*Department of Anesthesiology  
UCLA School of Medicine  
Center for the Health Sciences  
Los Angeles, California 90024*

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of this potential problem or to change the design of the support structure.

STEPHEN H. ROLBIN, M.D.C.M., F.R.C.P.(C)  
*Assistant Professor of Anaesthesia  
University of Toronto  
Toronto, Ontario  
Canada*

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