7. Rand CS, Kuldau JM, Yost RL: Obesity and post-operative pain. J Psychosom Res 29:43–48, 1985
8. Bennett R, Batenhorst R, Graves DA, Foster TS, Griffen WO, Wright BD: Variation in postoperative analgesic requirements

in the morbidly obese following gastric bypass surgery. Pharmacotherapy 2:50–53, 1982

In Reply:—I agree with most of the points made by Levin and colleagues. They point out that our patient may not have experienced near-fatal respiratory distress if we had 1) not used a basal infusion or if we had used much less than 2 mg/h; 2) programmed a 1- or 4-h limit on the amount of opiate delivered; and 3) monitored the patient more closely. All of these points were made in the last paragraph of our article and are worth repeating.

The authors state that a 1- or 4-h limit should be set at 20–30% of the "calculated dose." Although this would certainly provide a greater margin of safety, I am not sure that it would meet the needs of most patients. During periods of stimulation, *e.g.,* dressing changes and transport to and from procedures, patients often will deliver boluses as often as possible in order to control their pain. A 20–30% limit could easily leave these patients without analgesia for prolonged periods. This may cause the patient's primary physician either to order supplemental injections or to reject patient-controlled analgesia (PCA) altogether.

Our intent in publishing our case report was not to discourage the use of PCA but rather to suggest caution when dealing with obese patients, particularly those who may have obstructive sleep apnea syndrome.

PCA pumps capable of being programmed in a sophisticated interactive fashion are on the horizon. These pumps will have the potential to modify dose and frequency based on time of day and the patient's past record of drug demands and delivery. Such systems may help in optimizing the use of PCA; however, the need for vigilance and the development of sound clinical judgement will continue to be our best safeguard.

D. H. VAN DERCAR, M.D., PH.D.
Senior Resident
Department of Anesthesiology
University of Miami/Jackson Memorial Hospital
1611 N.W. 12th Avenue
Miami, Florida 33136

On the Pressure Rate Quotient

To the Editor:—It is unfortunate that both the authors of the original article[1] and the author of the letter[2] concerning the pressure rate quotient should have overlooked an important flaw intrinsic to this concept. This flaw, intrinsic to the logical structure of the formula, makes this index useless, and it could, and should, have been anticipated that its application would not have had any predictive value.

The formula "pressure/rate = quotient" can be rewritten as "pressure = rate × quotient." After substituting y and x for pressure and rate (and A for quotient), we have "Y = AX," which, on the cartesian plane, is the formula for the straight line passing through the origin, with "A" being the coefficient determining the slope of the line. Thus, one can easily appreciate how for any arbitrarily selected value assigned to the "quotient" there exists an infinite set of paired values for "pressure" and "rate" that will satisfy that value.

Intuitively, one could reject values that are clearly unacceptable (let us say a rate of less than 20 beats/min or a pressure greater than 300 mmHg). This is hardly the point, however: the purpose of the index would have been to resolve uncertainty in those instances where intuition and common sense fail.

Problems with structurally flawed formulas are not uncommon,[3] and the demise of the rate pressure product* is a further example of the misguided use of formulas.

ANTONIO BOBA, M.D.
587 Albany Post Road
Hyde Park, New York 12538

REFERENCES

1. Gordon MA, Urban MK, O'Connor T, Barash PG: Is the pressure rate quotient a predictor or indicator of myocardial ischemia as measured by ST-segment changes in patients undergoing coronary artery bypass surgery? ANESTHESIOLOGY 74:848–853, 1991
2. Buffington CW: Pressure-rate quotient in patients undergoing coronary artery bypass surgery. ANESTHESIOLOGY 75:710–711, 1991
3. Archie JP, Jr: Mathematical coupling of data (a common source of error). Ann Surg 193:296–303, 1981

* Barash PG, Seifeld F, Kay H, Condos S, Hashim S, Tinker J, Geha AS: RPP may it R.I.P. (abstract). ANESTHESIOLOGY 57:A22, 1982