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In Reply:—We appreciate very much the comments offered by Drs. Kao and Zavisca and Drs. Courtney and Bujor, who correctly emphasize the importance of temperature in the process of crystallization. While performing the studies described in our paper,[1] we also began studies dealing with the influence of temperature. Indeed, it appears that solutions that are kept in the refrigerator at 4° C have less visible precipitation. The complete studies comparing different *p*H changes at ambient (16–20° C) and low (4° C) temperature—by using count of particles and measurements of concentrations of bupivacaine, as previously described[1]—are still in progress. We believe that small differences of temperature that can be found between different operating rooms, as suggested by Drs. Kao and Zavisca, are not of major importance in the conditions of the already published paper[1] in which the minute amount of bicarbonate produced clinically insignificant differences of precipitation. On the other hand, when one studies solutions of bupivacaine for which large amounts of sodium bicarbonate produce significant changes of *p*H and precipitation,[2] the situation might be different. In these particular conditions, our preliminary results agree with the theoretical considerations of Drs. Kao and Zavisca, that the effect of temperature on crystallization will be more pronounced. This is shown in the results of studies dealing with solutions of 0.25% bupivacaine in which *p*H had been adjusted with 4.2% sodium bicarbonate (table 1). Finally, we also agree with the remarks of Drs. Courtney and Bujor who suggest that raising the temperature above ambient potentiates the crystallization. Moreover, we believe that epidural injection of alkalinized bupivacaine will allow equilibration of the injectate with tissue temperature, *i.e.*, 37° C, and will promote precipitation. We are currently testing the hypothesis that "hot" alkalinized bupivacaine might result in a "slow release effect" which might explain the increased duration of the sensory block that we observed in a previous clinical study.[2]

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TABLE 1. Bupivacaine Concentrations (Gas Chromatography) (Mean ± SD of Ten Measurements) and Count of Particles of Ten and Twenty-five Microns (Mean ± SD of Five Measurements) and *p*H-adjustment

	0.25% Bupivacaine* 20° C	0.25% Bupivacaine* + 0.8 ml of 4.2% Sodium Bicarbonate 4° C†	0.25% Bupivacaine* + 0.8 ml of 4.2% Sodium Bicarbonate 20° C
*p*H	5.42 ± 0.03	7.47 ± 0.02‡	7.45 ± 0.02‡
Bupivacaine Concentration (μg/ml)	2.47 ± 0.01	2.46 ± 0.10	2.49 ± 0.03
Number of particles			
10μ	9.6 ± 1.4	7.5 ± 1.7	110.8 ± 27.7‡
25μ	0.3 ± 0.1	1.3 ± 0.5‡	27.3 ± 16.9‡

* Bottles of 20 ml.

† Bottles of bupivacaine and bicarbonate were stored 48 h at 4° C before the study and were kept at the same controlled temperature during 6 h after alkalinization and before the measurements.

‡ Indicates $P < 0.05$ *versus* before alkalinization.

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Axillary Block Utilizing the Pulse Oximeter

To the Editor:—We enjoyed reading the review article by Tremper and Barker describing the basic physics and technological evolution of pulse oximetry.[1] As mentioned in their paper, several clinical studies have used the pulse oximeter for nonoximetric purposes such as might be fulfilled by any similar plethysmographic device. Recently, we found yet another example of this role for the pulse oximeter as demonstrated by the following brief case example.

A 40-yr-old male patient, 3 weeks status post burns to the right arm and hand, was brought to the operating room for release of the median nerve at the right wrist under axillary block. A catheter was inserted into a vein in the left arm and fentanyl and midazolam were given for sedation. The patient was placed supine with right arm at 90° abduction, and the axillary area was prepped. However, due to the patient's bulky stature and the degree of scarring and induration secondary to burn