Are Insurance Premiums Related to Use of Technology?

To the Editor:—Zeitlin and associates report that a reduction in premium was offered by the Joint Underwriting Association (JUA) in Massachusetts in rate year 1987, and that this beneficence came about through an incentive discount of 20% predicated on the use of monitors.1 Much credit is due the Massachusetts Society of Anesthesiologists and their able counsel, Mr. Edward Brennan. The meaning and magnitude of this putative coup may be more apparent than real, however.

The discounted premium for 1987 was, indeed, less (by about 16%) than the total premium finally levied for 1986.* The offer of an incentive discount, however, was accompanied (in rate year 1987) by a wallop ing 140% retroactive increase in the 1986 premium. While the proffered incentive discount may be a genuine expression of faith in the protective power of technology, the timing of the exercise is painfully reminiscent of the automobile salesman who offers a "generous" incentive rebate immediately after kiting the sticker price into the stratosphere.

To the best of my knowledge, no commercial or captive insurance company has—so far—offered a significant absolute reduction in premium based on the use of monitors. Although early enamored of monitoring and technology, I observe that outcome in medicine has not been favorably affected by electronic monitoring save for dysrhythmia mortality following myocardial infarction (where the phenomenon monitored was directly and uniquely related to the cause of mortality). In the practice of anesthesia, as monitoring has increased, so have liability costs. (Employing the same "self-evident" reasoning practiced today, the risk management gurus of the 1970s trumpeted the need for oxygen analyzers. Analyzers came to be employed almost universally—and liability costs skyrocketed.) It may be that (1) monitoring by technology, (2) outcome, and (3) liability costs are really independent variables.

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REFERENCE

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In Reply.—Dr. Bruner seems to have two objections to our letter. First, that the discount offered by the Joint Underwriters Association of Massachusetts is just a commercial maneuver, that it is a "bait and switch" trick; and, second, that the outcome of anesthesia care is not necessarily improved by the routine use of oximetry and capnometry.

Our letter was intended to be archival and also to suggest to the readers of Anesthesiology that perhaps they, too, could save money and, at the same time, do their patients some good. What has happened in Massachusetts since 1985 is the result of the coincidence of three events: the writing of standards of practice, the appearance of new and apparently valuable monitoring technology, and the desires of both anesthesiologists and executives of the insurance industry to control liability insurance rates.

Dr. Bruner's calculations mislead the reader. He has lumped together the basic coverage premiums, which indeed have been discounted, with retroactive payments. The latter are the unhappy result of the inability of the Insurance Commissioner to set final rates contemporaneously for the years 1983 to 1987. Our basic premiums have, in fact, decreased by 15% for claims made, and 20% for occurrence policies. For the coming year, we have been moved into a lower risk category on the basis of actuarial calculations. The net effect will be to reduce our basic premiums by a further 16.7%.* This result cannot fairly be compared to the activities of an unscrupulous automobile salesman.

Dr. Bruner has also ignored the other main requirement of the "Stipulation Regarding Discounts" that we observe the Standards for Basic Intraoperative Monitoring of the American Society of Anesthesiologists.† These standards emphasize the behavioral at least as much as the technological aspects of taking care of patients in the operating room. It should be noted that the adoption of the ASA Standards followed publication of the Standards for Patient Monitoring during Anesthesia at Harvard Medical School. This was the result of much thought by his own colleagues.2

In our letter, we stated that the effect of the now widespread use of these monitoring devices on outcome of anesthesia care remains to

* Massachusetts Medical Society letter to members; JUA professional liability rates and related issues: Attachment B. 10 June 1988.
be proven. There are a number of studies, however, which suggest that improved outcome might well occur. For example, McKay and Noble studied critical incidents and found that the oximeter gives the earliest warning of events that increase risk during anesthesia and that arterial desaturation was the commonest critical incident. Coit et al. concluded that pulse oximetry, in contrast to changes in vital signs, provided an early warning of developing hypoxemia in anesthetized children. When Caplan et al. analyzed the ASA Professional Liability Committee's Closed Claims Study, they found that difficulties in the management of the respiratory system were the single most common cause of injury. Furthermore, the reviewers of the files of closed malpractice claims judged that 40% of these mishaps might have been prevented by the combined use of oximetry and capnometry. Oximeters and capnometers should not be dismissed as just "electronic devices." They measure and continuously display the oxygen saturation and end-tidal carbon dioxide of humans with acceptable accuracy. In view of all this, I cannot accept Dr. Bruner's implication that hypoxemia and underventilation are never uniquely and directly related to the cause of anesthetic mortality.

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The pH Adjustment of 2-Chloroprocaine Hastens the Onset of Epidural Analgesia

To the Editor:—Recently, Glosen et al. concluded that there was no effect on the onset of epidural anesthesia when using 3% 2CP buffered with sodium bicarbonate. We have pursued this question with the following study.

After approval from the Institutional Review Board and informed consent from 30 ASA I or 2 patients in labor, we randomly divided the patients into one of three groups of ten patients. Group I received 2% 2CP, group II received 2CP buffered to a pH of 7.1 with sodium bicarbonate, and group III received 2CP buffered to a pH of 7.7. The solutions were prepared as follows: 2% 2CP: 3.0 mL saline/30 mL 2CP; pH 7.1 2CP: (1.0 mL 8.4% NaHCO3/2.0 mL saline)/30 mL 2CP; and pH 7.7 2CP: (2.5 mL 8.4% NaHCO3/0.5 mL saline)/30 mL 2CP. The pH measurements were made with an ABL-30 blood gas analyzer. All of the 2CP solutions were bisulfite free. All epidural needles were inserted at the L3–4 or L2–3 interspaces using the loss-of-resistance technique with air. All epidural catheters were inserted 2–2.5 cm into the epidural space with the patient in a sitting position. Thirty milliliters of study solution were administered to each labor patient through the epidural catheter followed by a waiting period of 2 min. At the end of the 2-min period, if the patient had not exhibited signs of an intravascular or subarachnoid injection and if attempts to aspirate blood or cerebrospinal fluid were negative, 5 ml of study solution were administered for a total volume of 8 ml. In order to standardize the time of onset of analgesia, the posterior bilateral S2–3 dermatomes were tested for analgesia to pinprick by a blinded observer at time 0, which was time immediately after the initial 3 ml was administered, and every 30 s thereafter until each patient reported loss of pain sensation to pinprick bilaterally. Statistical analysis was done using the one-way analysis of variance and the Tukey and Duncan’s multiple range tests. The group receiving 2CP buffered to a pH of 7.7 had a statistically significant faster onset (table 1). At a pH of 4.3, the nonionized fraction of 2CP is 0.001%; at 7.1, it is 1.6%; and at a pH of 7.7, it is 5.9%. The faster onset in the 7.7 pH-adjusted group was probably a result of the increased nonionized portion of 2CP. Dr. Glosen et al. may have noticed a quicker onset of the 3% 2CP had they buffered the 2CP from a mean pH of 7.08 to a pH of 7.7. Although the onset of analgesia in the patients receiving the pH-adjusted 2CP was decreased by just slightly more than 60 s, this decreased time of onset may be clinically important in emergent situations where one needs to hasten the onset of analgesia (i.e., imminent delivery, emergency forceps extraction, etc.). In these instances, increasing the pH to 7.7 may benefit both mother and fetus.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>4.351 ± 0.13</td>
<td>7.194 ± 0.03</td>
<td>7.72 ± 0.04</td>
</tr>
<tr>
<td>Onset (min)</td>
<td>4.00 ± 1.16</td>
<td>4.45 ± 0.77</td>
<td>2.65 ± 0.85*</td>
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</tbody>
</table>

Values are means ± SD.
* P < 0.05.