In Reply—The title of the letter by Lawson et al., All That Quakes Does Not Necessarily Shiver, expresses the basic contention of our article. Many clinical oscillations have been named but not quantified. Consequently, the literature concerning this topic is confusing and includes terms such as “coarse tremor,” “fine shake,” and “wet dog shakes.” In contrast, tremors of unclear etiology have frequently been considered normal thermoregulatory shivering without adequate justification. The purpose of our study was to determine whether postanesthetic tremors resemble normal shivering.

The EMG recording and analysis techniques we used were outlined in our paper. The details were described in 1973 by Stiles, in an article that was referenced in the Methods section of our paper. To prevent signal aliasing, electromyographic data were digitized at 1024 Hz, which is a rate approximately fourfold higher than the fastest shivering component. The signals were then amplitude demodulated, because Fox and Randall demonstrated in 1970 that the resulting bursting pattern correlated well with limb acceleration. Demodulation is a two-step process in which signals are rectified and low-pass filtered. Digital full-wave rectification is easily accomplished by taking the absolute value of each digital amplitude. Many different analog and digital filters have been described: we used a simple (but adequate) “boxcar” filter in which 16 non-overlapping values were averaged. The purpose of this filtration is to separate high frequency signals from the motion-related, low-frequency bursting pattern.

The autocorrelation functions for each signal were then derived to evaluate the dependency of the process at one point in time with values of the same process at other points in time. To determine the intensity at each frequency, the power spectra were computed from the square of the real portion of the last Fourier transform. All Fourier transforms assume that the process is stationary. To provide adequate frequency resolution, 16-s segments were used to analyze the bursting pattern, whereas 1-min segments were needed for the 4-8-cycle/min “waxing-and-waning” pattern.

Lawson et al. find it difficult to believe that the sharp 4–8-Hz spectrum seen in figure 3 of our study could be derived from the EMG signal seen in figure 1D of that study. Power spectral analysis is used commonly because it is frequently impossible to determine component frequencies of complex signals without mathematical assistance. This is particularly true when a complex signal has only a limited frequency range that is of physiological interest (e.g., 1–15 Hz for many tremors). Certainly, many unprocessed signals appearing to be random (e.g., “white noise”) have “tight” power spectra within a particular frequency range. For example, traces A and C in figure 1 (of this communication) appear to be random signals. In fact, 33% of the total signal intensity in trace A is between 5 and 7 Hz. The power spectra in trace B make it obvious that, within the frequency range of physiological interest, virtually all power is between 5 and 7 Hz.

We used the term “spontaneous EMG clonus” to describe an electromyographic pattern identical to that produced by pathological clonus. Because flexion-induced plantar clonus occurred simultaneously, we hypothesized that spinal disinhibition is the most likely etiology for this tremor. Other possibilities obviously exist, but were not specifically tested in our study. (In any case, such tests will be difficult in humans.) However, we do know that neither flexion-induced, nor

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**Fig. 1.** It is not possible to determine the component frequencies of a complex signal by visual inspection. Traces A and C are computer-generated sums of ~200 waves which both appear to be random (“white noise”). In fact, 33% of the total signal in trace A is between 5 and 7 Hz. The power spectra in trace B make it obvious that, within the frequency range of physiological interest (for many tremors), virtually all power is between 5 and 7 Hz.
The Use of a Vinyl Glove Does Not Affect Pulse Oximeter Monitoring

To the Editor—Recently Sloan1 reported three cases of finger injury following use of an oxygen saturation monitor probe. To further minimize injury with an oxygen saturation monitor probe, we recommend placing a vinyl glove on the hand to which the probe is to be applied (fig. 1). This would at least decrease the chance of injury occurring from chemical or bacterial contamination. We have not found the use of a vinyl glove to have an effect on the pulse oximeter reading.

After obtaining institutional approval, we studied ten healthy female patients who had regional anesthesia for either caesarean section or postpartum tubal ligation to determine what effect a vinyl glove would have on hemoglobin and oxygen saturation readings determined by pulse oximetry (SpO2). A Nellcor® oximeter probe was placed on the right index finger of each patient, and an SpO2 reading was made after 2 min. A Travenol Triflex® vinyl examination glove was then placed on the patient’s right hand, the pulse oximeter probe was again placed on the right index finger, and an SpO2 reading was made after 2 min. There was no significant difference between the SpO2 readings of the two groups.

**Table 1. Oximetry Readings (SpO2) With and Without Glove**

<table>
<thead>
<tr>
<th></th>
<th>SpO2%</th>
</tr>
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<tbody>
<tr>
<td>Ungloved finger</td>
<td>98.0 ± 0.81</td>
</tr>
<tr>
<td>Gloved finger</td>
<td>98.2 ± 0.79</td>
</tr>
</tbody>
</table>

There were no significant differences between the two groups.

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