the computer is a tool. When used appropriately it will enhance the anesthesiologist's awareness and capabilities.

The computer can acquire data from compatible sources and display them, on demand, in many different forms. This aids, rather than obscures, the recognition of any important trends. Despite this flexibility, the final printed record can be quite traditional in appearance.

Of course, the accumulation and reporting of data is only the first step in the evolution of an expert system, one which can perform calculations and time events, display a centralized warning system, and suggest differential diagnoses and courses of therapy. It can also keep track of personal or institutional protocols, e.g., treatment guidelines for malignant hyperpyrexia.

It should be noted that the computer-derived data are not more authoritative or infallible than any other laboratory data. Any results obtained must be tempered by clinical judgement as to its believability and relevance. If there are doubts about accuracy, the values need to be repeated. Ultimately it is still the physician who must determine the diagnosis and course of action to be taken.

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Do Not Fear Computerized Anesthesia Records

To the Editor:—I wish to comment on issues raised by Dr. Noel's recent letter[1] concerning the automated anesthesia record (AAR). First, justification for the "expenditure of energy toward production of . . . automated anesthesia records" should not require a well-defined end result. The AAR is not a technologic menace being foisted on unwilling anesthesiologists. Although medicolegal concerns may be one driving force, the designs are largely based on clinical needs expressed by many anesthesia practitioners, who perceive important deficiencies in the way records are currently kept. Technical problems facing the designers include methods by which data are entered, validated, recorded, displayed, printed, graphed, made secure, and (perhaps) edited. The forms that AARs eventually take will be determined by the marketplace after commercial implementation. It is likely that the systems with the greatest user acceptance will be those that most closely mimic the familiar manual record.

I agree with Dr. Noel that the anesthetic record is the "best tool for conceptually organizing the course of an anesthetic," but that should encourage rather than preclude automation. The manual record, with vital signs dutifully recorded at 5-min intervals, does not guarantee the anesthesiologist's attentiveness any more than the automated presentation of data is guaranteed to go unnoticed. The periodic scrutiny of the record for developing trends is a task more in character with monitoring than recordkeeping, and this distinction is important.[2] The AAR performs but a humble and mundane task of recording and presentation. It is the anesthesiologist, still very much "in the loop," who continues to bear the responsibility for awareness and interpretation of data to guide the anesthetic, a job fully worthy of human cognition. It should at least be based on data that are accurate, complete, up-to-the-minute, and legible.

I would compare the advent of the AAR with the disappearance of finger-on-pulse determinations of heart rate once the electrocardiograph and cardiotachometer appeared in every operating room. One could argue both a loss and a gain to the standard of care, but electronically measured heart rate is now considered indispensible.

More reliable records are expected to enhance care.* Anesthesiologists will not forsake their mission if the clipboard is replaced by an electronic display and they are freed from the tyranny of recording already-acquired data by hand.

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* Gravenstein JS: Essential monitoring examined through different lenses. J Clin Monit 2:22–29, 1986.

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