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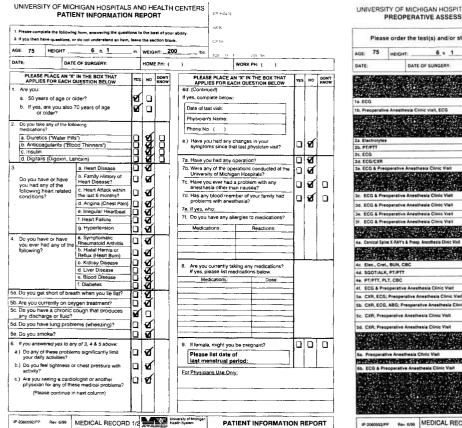
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Paper "Preoperative Computer"

To the Editor:—During the past decade, two aspects of the preoperative evaluation process have changed dramatically: the routine panel of preoperative laboratory studies and the in-house preoperative workup the night before surgery. The work by Roizen et al.^{1,2} initiated a reassessment of the routine battery of preoperative tests. Various protocols that determine the most appropriate preoperative laboratory tests, depending on the patient's age and medical history, have been recommended. Attempts have been made to automate this process by allowing the patient to answer questions via an electronic preoperative computer.³ This method required the availability of multiple electronic devices and was therefore not broadly adopted. More recently, the Internet has allowed the use of this same idea of automated processing via personal computers (available at http://www.

healthquiz.com). Electronic devices have been used because the testordering protocols, although easy to develop, are difficult to implement broadly in the environment of a medical center.

Because patients are no longer admitted to the hospital the night before surgery, preoperative-assessment clinics have been developed. Initially, many thought that it was important that all patients be seen in these clinics to avoid cancellations. At the University of Michigan, we thought it was unnecessary to see healthy patients (*i.e.*, American Society of Anesthesiologists physical status I and II patients) before the day of surgery unless the patient requested to see an anesthesiologist. Again, difficulty arises with respect to implementing a protocol to determine which patients would benefit from a preoperative clinic evaluation.



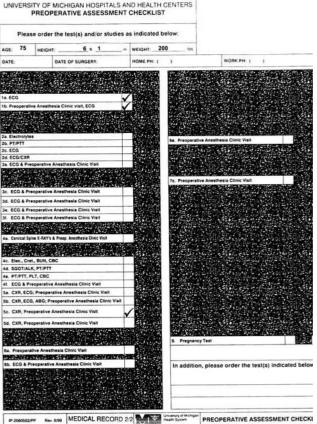


Fig. 1. The preoperative evaluation form. A question answered by the patient is copied to the form that instructs which laboratory tests should be ordered and if the patient requires an evaluation in the anesthesiology clinic. For example, this 75-yr-old patient answered "yes" to questions 1A and B; therefore, the order form indicated the need for electrocardiography and a preoperative evaluation. This patient also answered "yes" to question 5C, which requests a chest roentgenogram and a preoperative clinic visit.

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In 1993, we decided to use patients to help us make this decision. We had patients fill out a brief questionnaire (fig. 1)—not unlike the electronic method described—while they were in the surgeon's office. This questionnaire assessed which laboratory tests should be obtained and which patients should go to the preoperative clinic. The questionnaire is copied through four layers. The original and the first copy provide a chart copy and a shadow copy of the patient's answers, respectively. The bottom two layers indicate which tests are necessary and which patients should receive a preoperative anesthesia consultation. For example, if the patient marks "yes" to the question "Heart attack within the last 6 months," the back-up copies will be marked "yes" in the column that states "ECG and go to Anesthesia Preoperative Clinic."

Advantages of this technique are its simplicity and cost (\$0.05/copy). Because there is only one "decision layer," this paper "computer" has only one layer of "logic." Nevertheless, this system has been effective during the past 6 yr. We have reduced our preoperative clinic visits from 60% of same-day surgery patients in 1991 to 25% from 1994 to 1998. During this period, our cancellation because of medical problems undetected preoperatively has remained less than 0.05%.

The advent of a fully integrated electronic medical record will undoubtedly replace our system. Until that time, we recommend this simple paper computer as a cost-effective solution.

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