

tation is the same for every student, without omission or haste caused by demands of the surgical schedule upon the instructor's attention or time. The student is free to make the recorder go back and repeat ideas which he has not fully grasped without fear of embarrassment or reluctance over delaying a group. The dissemination of this information can be going on while the entire departmental staff is occupied with other duties. This is bound to be of considerable value for a department short-staffed. In addition to these advantages, audiotapes instruct the student in the use of this type of recording device and its availability as a teaching aid.

We have our students listen to a tape on departmental routine and course orientation before he comes on service or on the first morning of their service. Other tapes have been pro-

duced on topics which will be of value to them in general practice or in specialties other than anesthesiology. These topics include care of the unconscious patient, the pharmacologic action of narcotics, pressors, and anesthetic agents, and an introduction to data processing methods in anesthesia in particular and medical science in general.

Audio-tapes cannot and should not take the place of personal instruction and demonstration. We have found them, however, a valuable teaching adjuvant, enthusiastically accepted and actively used by our medical students.

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Halothane and Hepatic Necrosis

To the Editor.—In reference to "Halothane and Hepatic Necrosis," I read your Editorial (January–February 1963, p. 109) and feel strongly urged to offer a point of view which may be of some help in this grave problem.

It would be a great loss to the practice of anesthesiology if we would have to eliminate halogenated hydrocarbons because of the unfavorable misuse to which they are put. I don't believe that halothane offers any special advantages, and because of its great expense and relatively low boiling point one is practically forced to use this agent with low flows and rebreathing systems in order to practice economy. I believe that this agent could be used safely if adequate ventilation were provided. By adequate ventilation, I mean 30 liters per minute, the minimum which is required for a normal tidal exchange of 500 ml., 12 times per minute. Therefore, the method of use is the offender in the problem of hepatic necrosis.

Halothane may be a step more refined than chloroform. I have found, however, from a fairly large clinical experience, that methoxyflurane (Penthrane) is far better than halothane when used with our intermittent system of large flows, that is, in our respirator con-

trolled and assisted anesthesia which we demonstrated at the Post Graduate Convention. A description of this system was published in *ANESTHESIOLOGY* (March–April 1963, p. 254).

I am afraid that the view looks quite black if we continue to use halothane in poorly ventilated patients. Never before in the history of anesthetic agents has a single drug like halothane been thrust upon us with such economic pressure.

Before coming to any conclusions about halothane, let us consider inadequate ventilation as the chief offender when dealing with hepatic necrosis.

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To the Editor.—I was most interested to read your Editorial on the subject of halothane and hepatic necrosis, and the reports by Brody and Sweet of hepatic failure following halothane administration, recorded in your issue of *ANESTHESIOLOGY* of January–February, 1963.

As your Editorial states, more and more cases of hepatic necrosis following halothane anesthesia are being reported in the literature. In