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In Reply:—We appreciate Dr. Solonuik's comments and agree that ethical standards are important and should receive the careful attention of all behavioral researchers. We did not observe the anesthesiologists' behavior but rather examined their records and, as we pointed out, took care to keep the identifiable characteristics of the data secure. There is a potential problem in detailed behavioral studies: were we to undertake a similar study today we should wish to make complete records of the anesthesiologist's behavior and we would obtain their consent in their role *qua* subjects. Our institutional review committee does not generally require informed consent for review of patient records, providing that appropriate safeguards are taken concerning confidentiality. The anesthetic record is part of the greater patient record and, thus, would be covered by such a general practice.

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Humidification of Inspired Gas

To the Editor:—We read the article by Bissonnette *et al.*[1] and are concerned that both the temperature and absolute humidity of inspired gas were not considered by the authors. When artificial methods of humidification of inspired gas are considered, it is essential to think in terms of absolute humidity (the mass of water vapor in unit volume at given temp) and temperature.[2] Relative humidity is the amount of water vapor present in a gas at any given temperature expressed as a percentage of the amount of water vapor that the gas would hold if fully saturated at that temperature. The relative humidity of inspired gas was at 90% with active airway humidification. When the heat and moisture exchangers (passive humidification) were used, relative humidity was 50% at the beginning of anesthesia and gradually increased to 80% after 90 min. Since temperature of inspired air was not mentioned, it is reasonable to assume that it was 37° C and 25° C with active and passive humidification, respectively. The mass of water vapor in inspired gas would be 39.6 (44 × 0.90) mg/l with active humidification and 18.4 (23 × 0.8) mg/l with passive humidification after 90 min of anesthesia.[2] The water content in the inspired gas with active humidification is twice that with passive humidification. This demonstrates that absolute humidity in the inspired gas with active humidification was significantly greater than that with passive humidification and it is incorrect to conclude heat and moisture exchangers "after approximately 1.5 h of anesthesia, provided nearly as much airway humidification as active systems."

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In Reply:—Drs. Sum-Ping and Mehta are mistaken in stating that "it is essential to think in terms of absolute humidity." Clinicians may humidify respiratory gases to: 1) prevent tracheopulmonary damage; and 2) minimize hypothermia. Tracheal ciliary function is well preserved when relative humidity is >50%, at a wide variety of inspired gas temperatures.[1–3] Ciliary function is minimally dependent on absolute humidity.[4] Furthermore, inspired gas temperatures sufficient to provide the highest absolute humidities actually decreases mucociliary function, functional residual capacity, and pulmonary compliance.[5,6]

Heat and moisture exchangers warm inspired gases as well as humidifying them (because the heat of condensed expired steam is absorbed and returned to inspired gas when the water evaporates).[7,8]

Furthermore, Drs. Sum-Ping and Mehta's assumptions about inspired gas temperatures,[9] expired gas humidity,[10] and the formula they use to estimate vapor mass[11] are incorrect. In any case, absolute inspired gas humidity is only important for it's ability to decrease respiratory heat loss. Because we directly measured central temperature, we can conclude (without calculations) that both passive and active airway humidification minimize hypothermia.

In summary, both active and passive airway humidification provides sufficient moisture to prevent tracheal ciliary damage. Heat and moisture exchangers are about half as effective as active systems in preventing central hypothermia in anesthetized infants and children. Passive systems are, however, considerably less expensive and much easier to use than the active ones.

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Preoperative Fasting of Children

To the Editor:—I read with concern the paper by Sandhar *et al.*[1] in which it was suggested that children may be given an unspecified amount of oral fluid 2.25 h before surgery without increasing the risk of pulmonary aspiration of gastric contents. This conclusion was largely based on the finding that a small volume of oral fluid (5 ml/kg) given to a limited number of patients 2–3 h preoperatively failed to produce a clinically significant increase in the gastric aspirate at induction of anesthesia. Moreover, 58% of patients given a drink received oral ranitidine, which reduced gastric volume, compared with 44% of patients who maintained their fast.

A further problem with Sandhar *et al.*'s paper is the reference to a study by Miller *et al.*[2] These authors claimed to have shown that giving gynecologic patients tea and toast 2–3 h preoperatively did not increase the volume of gastric contents at induction of anaesthesia. However, careful reading of the paper reveals that ten of their 23 "fed" patients had actually fasted more than 4 h and the mean fasting time for the group was 3.8 h.

In a previous study we showed that 10 ml/kg of oral fluid given 2–4 h preoperatively to unpremedicated children did produce a clinically significant increase in the residual gastric volume at induction of anesthesia.[3] Unless more substantial evidence can be produced to refute this, it would seem imprudent to abandon the established practice of withholding fluids from children for a minimum of 4 h preoperatively.

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