CORRESPONDENCE

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An Effect of Temperature on Anesthetic Solubility and Partial Pressure: Clinical Importance

To the Editor.—Ori, Ford-Rice, and London suggest that opioid receptors represent a possible target influenced by general anesthetics, although they add that this influence might not produce the anesthetic state.

They find that 100% nitrous oxide and 2% halothane (the latter more than the former) decrease the density of binding sites for opioid receptors from guinea-pig brain, and that halothane also decreases binding affinity. Both nitrous oxide and halothane decrease μ binding affinity.

It is not clear to me that these findings are relevant to anesthetizing concentrations of anesthetics. Although Ori, Ford-Rice, and London used what appear to be reasonable concentrations of anesthetic for equilibration of their homogenates, equilibration was accomplished at 37° C. Because an increase in temperature decreases the solubility of gases, including anesthetics, the subsequent increase in temperature applied by Ori, Ford-Rice, and London would increase the anesthetic partial pressure. The partial pressure of halothane that would result at 37° C would be about 8.9% of an atmosphere. Such a partial pressure is eight times that required for anesthesia. Indeed, this interpretation would apply at any temperature because a decrease in temperature decreases anesthetic requirement. Perhaps we should reserve judgment on the effect of general anesthetics on opioid receptors until these elegant studies can be repeated at anesthetizing partial pressures.

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