quire an explanation. The fact that these patients had primarily visual disturbances may indicate that the "blood-retina barrier"[3] does not prevent the entry of intravascular glycine into the interstitial spaces of the retina. If glycine does cause these disturbances, perhaps some visual test could be devised that would alert the anesthesiologist of significant intravascular absorption of irrigating fluid.

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Controversies Regarding the Prophylactic Use of Dantrolene for Malignant Hyperthermia

To the Editor:—In a recent letter, Dr. Dolan questioned the prophylactic use of dantrolene for malignant hyperthermia (MH).[1] I agree with him that there is confusion about the proper dose and the recommended ways to medicate the patient. When I first pretreated MH susceptible (MHS) patients with dantrolene in 1976, I used large doses (4–8 $mg \cdot kg^{-1} \cdot day^{-1}$) because of experience with the pig.[2] However, it was obvious at that time that this dose created numerous undesirable side effects such as slurred speech, ataxia, muscle weakness, blurred vision, nausea, and vomiting. This caused us to reevaluate our medication schedule with the drug. We found that a single oral dose four hours prior to anesthesia was more effective in blocking porcine MH than were much larger doses given for a period of two days. The dantrolene was administered four hours before anesthesia because the expected peak blood level from the oral route occurs at approximately that time.[3] The gastrointestinal problems, particularly in children who would frequently vomit, caused us to further modify our technique of administration. Since 1977 our protocol for administration of dantrolene in MHS patients is to give a total oral dose of 2.2 mg/kg body weight (1 mg/lb), one-half the dose eight hours preoperatively, and one-half the dose four hours preoperatively. This means that the first dose should have a blood level equal to the drug's half-life and the second dose should be at its peak[3] at the time of operation.

In the case reported by Fitzgibbons,[4] there was no mention that the patient had received dantrolene prophylacticly within eight hours of operation. The incomplete protection which she reported was similar to that which we found in the pig given relatively large doses of dantrolene for several days.[2] In order to get protection of the pig with multiple doses for several days, we had to administer 24 $mg \cdot kg^{-1} \cdot day^{-1}$. Lower doses gave incomplete protection. I think the failure of the dantrolene in the case described by Fitzgibbons may have been more a problem of when it was given rather than how it was given.

I agree with Dr. Dolan that excessive pretreatment of the patient for several days with dantrolene increases the cost of hospitalization and probably offers little benefit for the patient. Using our regimen, one does not significantly increase the cost of hospitalization. In our institution, a 100-mg capsule of dantrolene costs $0.17 with a dispensing charge of $4.87. This is an inexpensive medication. The cost for 100 mg of intravenous dantrolene is $138 for the drug and $19.87 for administration. Intravenous dantrolene is an expensive medication, but less expensive than two additional days of hospitalization. Thus, the cost, using our oral regimen is not a major consideration in the prophylactic use of dantrolene.

Whether or not prophylactic dantrolene is necessary is a more important question which cannot be answered at the present time; I have asked the same question myself. With the present state of confusion concerning the etiology of and the proper anesthetic management protocol for MH, it seems prudent to protect the patient with dantrolene.

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Another Method of Mixing Air and Oxygen

To the Editor:—We have read with interest the recent letter of Priano, Solanki, and Gloyna, concerning a simple method of mixing air and oxygen utilizing an Alligation Alternate.[1] Nomograms do exist,[2] but as correctly pointed out, usually are absent when needed. Calculation of flows to achieve the desired inspired oxygen concentration ($F_{I_{O_2}}$) when mixing oxygen with one other gas, *e.g.*, nitrous oxide or nitrogen, is simple.

We presume most persons delivering anesthesia have access to a simple hand-held calculator, and assume, for ease of calculation that room air is composed of 20% oxygen and 80% nitrogen. To mix air and oxygen we convert the air flow to the equivalent flow of pure nitrogen. This allows us to set the flow of air ($\dot{V}_{air}$), and by simple subtraction from the total flow ($\dot{V}_{total}$) set the flow of oxygen ($\dot{V}_{O_2}$) as follows:

$$\dot{V}_{total} = \dot{V}_{air} + \dot{V}_{O_2} \quad (1)$$

$$\dot{V}_{air} = \frac{\dot{V}_{total} \times (1 - F_{I_{O_2}})}{0.8} \quad (2)$$

thus,

$$\dot{V}_{O_2} = \dot{V}_{total} - \dot{V}_{air} \quad (3)$$

For example, assume one wishes a total flow of 10 l/min and a $F_{I_{O_2}}$ of 0.4:

$$\dot{V}_{air} = \frac{10 \times (1 - 0.4)}{0.8} = \frac{10 \times 0.6}{0.8} = 7.5 \text{ l/min}$$

and

$$\dot{V}_{O_2} = 10 - 7.5 = 2.5 \text{ l/min}$$

Equation 2 may be rewritten as:

$$\dot{V}_{air} = \dot{V}_{total} \times (1 - F_{I_{O_2}}) \times 1.25 \quad (4)$$

which allows one to obtain the answer without needing a calculator.

An inline, properly calibrated, oxygen analyzer gives a double check of one's calculations and its use is recommended.

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