ses to be tested *before* the experiment is carried out. If this is done, there will be no doubt as to which hypotheses may be tested individually and which require use of multiple comparison procedures.

There is a further error in making analytic comparisons that commonly is seen in medical literature. This is the failure to recognize when pairwise comparison of means is inappropriate. Often, the treatments represent steps along some ordered scale, *e.g.*, different doses of a drug. The ordered nature of the treatments often is ignored in the analysis, and comparisons of pairs of means are made using *t* tests or other procedures.[5] Usually the hypotheses to be tested will relate to the existence or form of the dose–response relationship, rather than which particular dose level is different from which other dose level or from placebo. Response curve analysis is the appropriate technique in this case.[5]

In recent years, the cost and ethical implications of improper statistical analysis of medical research data have been a problem of growing concern. The editors of ANESTHESIOLOGY are to be commended for their efforts to improve the quality of data analysis and reporting in the journal.

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A Simple Nomogram for Determining Drug Infusion Rates

To the Editor:—The infusion of many vasoactive drugs has become commonplace in the practice of anesthesia during the last decade. Some methods for simplifying the calculation of doses for infusion were reported in the Journal recently.[1,2] However, it would be preferable if you could tell the rate of infusion just by

TABLE 1. Dilution Nomogram: Dilute 100 mg of a Drug to X ml, and the Set Pump Rate (ml/h) Is Equal to Drug Infusion Rate in $\mu g \cdot kg^{-1} \cdot min^{-1}$

BW (kg)	X (ml)	BW (kg)	X (ml)	BW (kg)	X (ml)	BW (kg)	X (ml)
1	1666.7	21	79.4	41	40.7	61	27.3
2	833.3	22	75.8	42	39.7	62	26.9
3	555.6	23	72.5	43	38.8	63	26.5
4	416.7	24	69.4	44	37.9	64	26.0
5	333.3	25	66.7	45	37.0	65	25.6
6	277.8	26	64.1	46	36.2	66	25.3
7	238.1	27	61.7	47	35.5	67	24.9
8	208.3	28	59.5	48	34.7	68	24.5
9	185.2	29	57.5	49	34.0	69	24.2
10	166.7	30	55.6	50	33.3	70	23.8
11	151.5	31	53.8	51	32.7	71	23.5
12	138.9	32	52.1	52	32.1	72	23.1
13	128.2	33	50.5	53	31.4	73	22.8
14	119.0	34	49.0	54	30.9	74	22.5
15	111.1	35	47.6	55	30.3	75	22.2
16	104.2	36	46.3	56	29.8	76	21.9
17	98.0	37	45.0	57	29.2	77	21.6
18	92.6	38	43.9	58	28.7	78	21.4
19	87.7	39	42.7	59	28.2	79	21.1
20	83.3	40	41.7	60	27.8	80	20.8

looking at the numbers displayed on the infusion pump. I have been using a nomogram (table 1) for a long time to make a dilution of any drug, which converts the pump setting directly to the drug infusion rate numerically. For example, if you have a 70-kg patient and dilute 100 mg of any drug to 23.8 ml, the pump set number in ml/h will be equal to the rate of drug infusion in $\mu g \cdot kg^{-1} \cdot min^{-1}$. If you are dealing with 10 mg of a drug and dilute it to the same volume, you can simply move the decimal point one place to the left in order to think in terms of $\mu g \cdot kg^{-1} \cdot min^{-1}$.

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Medical Protocol by Habit—The Avoidance of Amide Local Anesthetics in Malignant Hyperthermia Susceptible Patients

To the Editor:—Those of us who have a special interest in caring for malignant hyperthermia susceptible (MHS) patients often are questioned by other physicians asking if a certain procedure could be done safely under local or regional anesthesia. Many of us have responded that, among many other things, the amide type local anesthetics are contraindicated,[1] whereas the ester type are acceptable.[2]

Where did we get this idea? In my case, I learned it from my mentors and from many articles that cautioned me to avoid the amides, since the amides might cause an MH reaction by releasing calcium from the sarcoplasmic reticulum, and use only the ester anesthetics in my MHS patients. Questioning other physicians involved in MHS patient care yielded the same caveat but no specific case reports or references. After an extensive search of the literature, I have been unable to find any reports of any malignant hyperthermic crisis caused solely by the use of amide local anesthetics without epinephrine. On the contrary, there is a report[3] of a spinal anesthetic with tetracaine followed by procaine infiltration resulting in an acute febrile reaction in an MH survivor. There is also a report that high blood levels of two different amide local anesthetics given experimentally to MHS pigs did not induce malignant hyperthermia[4] and another study showing that lidocaine administered to MHS pigs beyond the level of systemic toxicity did not stimulate any signs of MH.[5] Since these pigs have been inbred to be highly susceptible to MH and are probably more susceptible than almost every affected human, their failure to demonstrate signs of MH would lend credence to the thought that amide local anesthetics may be safe in human MHS patients. Furthermore, lidocaine has been used successfully to treat the arrhythmias of a severe MH reaction[6] and, in fact, lidocaine has been used routinely as a local anesthetic without problems on MHS patients in at least one institution.*

The amide local anesthetics often are desirable, since they are able to provide better penetration of tissue and, except for tetracaine, greater duration of action[7] than the esters. These characteristics, along with decreased allergenicity,[8,9] combine to help protect our MHS patients from several other potential stresses during a procedure, and stress itself has been implicated in causing episodes of MH.[10]

The question I am posing is clear. Is there any evidence that amide local anesthetics are contraindicated in MHS patients, or is our habit of avoiding them just a habit?

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