In Reply—Dr. Hellyer and colleagues contend that we were not acting in accordance with National Institutes of Health (NIH) guidelines, which clearly state that analgesics should be administered as required as part of postsurgical care. In fact, we use analgesics postoperatively in all of our dogs. All protocols are approved by the Animal Care Committee of the Medical College of Wisconsin (a veterinarian is a voting member), and all protocols conform to the Guide for the Care and Use of Laboratory Animals as published by the NIH. Before and after surgery, all animals are visited daily by a veterinarian to ensure that a high level of health care is received by all animals.

Unfortunately, when methods are described, important information occasionally is omitted. Use of postoperative analgesics will be stated in all future manuscripts from this laboratory, since this is one aspect of postsurgical care that should be clearly mentioned. This is especially true in the current climate of rather vocal antivivisectionists. I encourage all other authors to follow this advice, since the letter of Dr. Hellyer and colleagues is applicable to many other investigations as well.

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A Modified Y-type Set for Efficient Blood Transfusion

To the Editor—Rapid transfusion of red blood cells is vital in the management of any patient with massive hemorrhage. A large-bore cannula, preferably inserted into a central vein, will allow a unit of reconstituted red blood cells to be completely infused, under pressure, within several minutes. The commonly used Y-type transfusion sets greatly facilitate the dilution of red blood cells with normal saline.

The limiting factor with such devices is the time it takes to disconnect an empty red cell bag from the blood pump and transfusion set and replace it with a new unit, and then perform reconstitution and pump activation. The interruption to red cell transfusion is, at best, about 90 s in experienced hands. This observation is similar to that of another group of investigators, who found that it took an average of 65.71 s for anesthesiologists to change blood bags in a pressurized pump as fast as possible. The time did not include red cell reconstitution. The delay is even longer if an inexperienced person is asked to change the blood bags when the practitioner is engaged in other resuscitative maneuvers (e.g., vascular cannulation).

We herein present a modification of the existing Y-type set to virtually eliminate the described delay (fig. 1). When one unit of blood is being infused under pressure, another unit of red blood cells is being reconstituted, inserted into a pump, and pressurized. As soon as one bag of red cells is emptied, the infusion of the contents of the other pressurized bag is begun by closing and opening the appropriate clamps. The interruption to transfusion is only a couple of seconds. The blood filter should have at least twice the filtering capacity to prevent early clogging, and the tubing should be widened to decrease flow resistance.

Currently, this transfusion technique can be improvised with a pair of standard Y-type sets piggy-bagged to one another with a 14-G needle or a Y-connector. This technique does not appear to be widely used or known. It has the disadvantage of having an excessive number of tubings in a situation in which overcrowding of tubings may already be a problem. We believe that our proposed transfusion set is less cumbersome and more elegant and would be preferred by most practitioners.

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Fig. 1. A modified Y-type transfusion set.