tional human evidence that, in normal patients deeply anesthetized with halothane, succinylcholine routinely increases jaw muscle tone.[4]

With this information in mind, I believe that the clinician should now regard trismus in a different light. In the situation described in these two retrospective studies, *i.e.*, pediatric use of halothane and succinylcholine, trismus obviously does not herald the onset of malignant hyperthermia 50% of the time. Thus, our philosophy in regard to management of such patients should change. It seems warranted that, when trismus occurs after such an induction, the case need not be stopped immediately. There should be judicious monitoring of end-expired CO_2, venous and perhaps arterial blood gases, blood pressure, pulse, temperature, urine color, and muscle tone. Should these be stable, the procedure may be continued. Should any changes occur suggesting an abnormal metabolic response, then the case should be halted if at all possible and treatment instituted for malignant hyperthermia. However, to properly evaluate these cases of trismus, it is desirable that these patients undergo muscle biopsy and contracture responses. This will enable us to eventually determine the true relevance of this response. In addition, values for creatine phosphokinase should be determined to examine whether a greater-than-normal increase occurred.

This proposed management of trismus is a radical departure from prior philosophy, and may be controversial in regard to medical-legal questions. If the clinician wishes to be more conservative, then he or she should follow Dr. Rosenberg's advice, and not attempt to change his or her approach. The ability to answer this question concerning trismus may be progressively evaporating as the use of succinylcholine is replaced by newer non-depolarizing muscle relaxants. In fact, this is the course that Dr. Rosenberg and others[5] suggest, as they recommend that the use of succinylcholine should now be reserved for specific indications.

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In Reply:—Dr. Gronert proposes that patients who experience trismus after succinylcholine need not have anesthesia stopped and surgery rescheduled. Instead, anesthesia may be continued with non-triggering agents and sufficient monitoring to ensure that, should malignant hyperthermia develop, it would be detected and treated early. Indeed, others also espouse this recommendation.[1] I do not. My reasons are as follows:

End expired CO_2 monitoring, the most sensitive means of detecting malignant hyperthermia, is not available in all operating rooms, and, if it is, the monitor requres time for calibration (during which time the patient would be anesthetized). Insertion of arterial (and venous?) catheters is time consuming and detracts from close patient observation.

However, my major objection is that malignant hyperthermia may not occur immediately after trismus, but may occur sometime during the operative procedure. Now the surgeon would have to be told to abort the operative procedure, perhaps at an inconvenient time, or rush through the surgery. Dantrolene would then have to be secured and administered. By these actions, we have unneccesarily increased the risks for the patient.

Finally, patients who have experienced trismus without any other sign of malignant hyperthermia may experience significant muscle destruction, myoglobinemia, and myoglobinuria. If myoglobinuria is not recognized and treated, then it is possible that myoglobinuric renal failure may ensue. There is no information to indicate if continuing the anesthetic with a non-triggering technique would worsen such muscle destruction; I think it might.

Certainly, for an elective procedure, I believe that the additional problems that might be engendered by continuing the anesthetic are simply not justified. Therefore, I advise practitioners that, following trismus in a patient having an elective procedure, surgery should be

rescheduled, and the patient evaluated by muscle biopsy. If the surgery is life-saving or emergent, then I recommend intravenous dantrolene along with switching to non-triggering anesthetics and appropriate invasive monitoring.

The problem of the coincidence of trismus with malignant hyperthermia is discussed further in my editorial, and I certainly agree with Dr. Gronert's recommendation that, after trismus, patients should undergo muscle biopsy.

Although many agree that succinylcholine is a drug whose complications are so numerous that it should be used on indication only, nevertheless, succinylcholine is still used extensively in anesthesia practice. It will take many years for the new non-depolarizing relaxants to supplant succinylcholine. Therefore, I think we are going to be faced with trismus after succinylcholine for many years to come.

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Another Use for Swivel Adaptors

To the Editor:—Heart and breath sounds are monitored with a stethoscope either placed externally on the precordium or internally in the mid-esophagus through the oro/nasopharynx. The heart beat and the breath sounds heard with the internally placed esophageal stethoscope are loud and clear because it is placed closer and separated by less dense tissue from the heart and the lung than with the precordial stethoscope. Placing the esophageal stethoscope in the oropharynx is possible only when anesthesia is administered *via* an endotracheal tube to the patient. When a face mask is used, any probe in the oropharynx coming out between the mask and the patient's face will prevent a tight fit of the mask on the patient's face, and will interfere with adequate ventilation because of leaks.

We have designed a modification of the standard mask adaptor (fig. 1) that permits insertion of an esophageal stethoscope or any other probe (temperature, fiberoptic bronchoscope, suction catheter, or N-G tube) into the oropharynx when a face mask is being used without loss of the airtight fit of the anesthetic system. The modification consists of a swivel adaptor (Portex®)

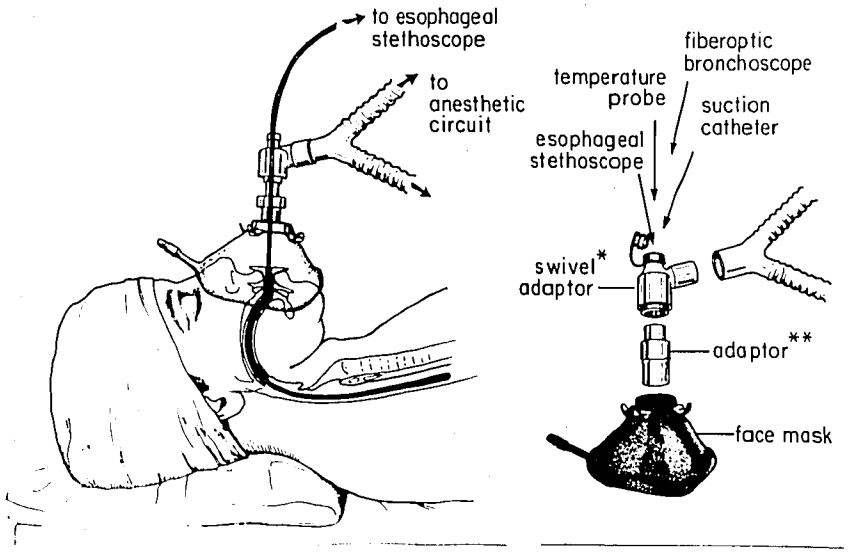

FIG. 1. *Left.* The fully assembled system with the esophageal stethoscope passing through the swivel adaptor in an anesthetized patient. *Right.* The exploded view. *Portex® swivel adaptor Fiberoptic H 625109. **Modified Jackson Rees' circuit (Vital Signs®) H 5102.