

8. Editorial. *Can Anaesth Soc J* 22:123, 1975  
 9. O'Carroll TM, Greenbaum R, Thornton PGN: Agent-specific filling devices. *Anaesthesia* 35:807-810, 1980

10. Richardson W, Carter KB: Evaluation of keyed fillers on TEC vaporizers. *Br J Anaesth* 58:353-356, 1986  
 (Accepted for publication June 25, 1987.)

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### Midazolam-induced Ventricular Irritability

*To the Editor:*—Recently, three young adult patients, ASA Class I, scheduled for elective surgery at this facility demonstrated ventricular irritability (bigeminy and trigeminy) and tachycardia after premedication with intramuscular midazolam (Versed®). No anticholinergic or analgesic premedication was given. In each case, preoperative ECG revealed normal sinus rhythm without ventricular extrasystole. These dysrhythmias were noted during the pre-induction period, approximately 45 min after intramuscular injection of midazolam (Versed®). This correlates well with the reported peak effect of im midazolam of 45-60 min.<sup>1</sup>

All our patients appeared well sedated, and demonstrated anterograde amnesia for the immediate preoperative period. Insertion of intravenous cannula may cause pain leading to sympathetic nervous system stimulation and dysrhythmias. In our patients, local infiltration of 1% lidocaine via 25-gauge needle preceded cannula insertion, and all patients denied pain. Each of our three patients denied excessive consumption of caffeine, alcohol, tobacco, or drug use. In no case was a history of mitral valve prolapse or dysrhythmia obtained. In addition, postoperative echocardiography was normal in two of three patients tested. In every case, cardiac disturbances resolved over 2-4 h, corresponding with the reported elimination half-life of midazolam of 1-4 h in healthy humans.<sup>2-4</sup>

Two of our three patients subsequently underwent general anesthesia (without midazolam) and did not demonstrate ventricular irritability. Except for the deletion of midazolam, the anesthetic protocol was unchanged.

The package insert provided with midazolam lists "tachycardia, bigeminy, and premature ventricular contractions" occurring at less than 1.0%. These effects were noted during clinical trials of midazolam.

While a direct drug effect of midazolam resulting in ventricular irritability is possible, serious questions remain unanswered. Why can much higher doses of midazolam be given for induction of anesthesia without ventricular irritability? Why has this effect not been seen previously, considering the widespread use of midazolam?

It is the opinion of the author that ventricular dysrhythmias can be rarely associated with midazolam. While that is not a frequent occurrence, midazolam should be considered in the differential diagnosis of such events.

GEORGE J. ARCOS, CAPTAIN, USAF MC  
 Department of Anesthesiology  
 USAF Regional Hospital  
 Maxwell AFB  
 Montgomery, Alabama 36112-5304

#### REFERENCES

1. Fragen RJ: Parenteral premedication with midazolam. *Anesthesiol Rev* 12(35):37-39, 1985
2. Greenblatt DJ, Abernethy DR, Lowniskar A, Harmatz JS, Limjoco RA, Shader RI: Effect of age, gender, and obesity on midazolam kinetics. *ANESTHESIOLOGY* 61:27-55, 1984
3. Heizmann P, Eckert M, Ziegler WH: Pharmacokinetics and bioavailability of midazolam in man. *Br J Clin Pharmacol* 16:435-495, 1983
4. Allonen H, Ziegler G, Klotz U: Midazolam kinetics. *Clin Pharmacol Ther* 30:653-661, 1981

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### It's Tuohy, Not Touhy

*To the Editor:*—I read with interest the letter by Harvey in the May, 1987, issue of the Journal.<sup>1</sup> However, I was startled by the misspelling of the word "Tuohy" which appeared six times throughout the letter. I could

understand how an anesthesiologist in clinical practice could make that error, as I have myself.<sup>2</sup> That it slipped by editorial review, however, is surprising. Edward B. Tuohy (1908-1959) described his needle in 1944 and

used it primarily for continuous spinal anesthesia.<sup>3</sup> Incidentally, "Schliff" in German means "bevel."

RICHARD B. CLARK, M.D.

*Professor*

*Departments of Anesthesiology and Obstetrics/Gynecology*

*Director*

*Obstetric Anesthesia*

*University of Arkansas for Medical Sciences, Slot 515*

*4301 West Markham*

*Little Rock, Arkansas 72205*

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*In Reply*—Dr. Tuohy does indeed deserve an apology. My thanks to Dr. Clark for pointing out our error.

LAWRENCE J. SAIDMAN, M.D.

*Editor in Chief*

REFERENCES

1. Harvey RC: A new epidural needle modification. ANESTHESIOLOGY 66:704-705, 1987
2. Romine JC, Clark RB, Brown WE: Lumbar epidural anesthesia in labour and delivery: One year's experience. J Obstet Gynaecol Br Commonwealth 77:722-727, 1970
3. Clark RB: The origination of common eponyms used in anesthesia. ANESTHESIOLOGY 63:338-339, 1985

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*Department of Anesthesiology  
University of California, San Diego, T-015  
San Diego, California 92093*

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