

when the drug is run through polyvinylchloride (PVC) infusion sets⁶ and that we used non-PVC-type, polyethylene–polypropylene administration sets.

The results of our two investigations should be appreciated with respect to the age of the patients studied, the severity of their coronary artery disease, their incidence of previous myocardial infarction, and to the presence of a peripheral vascular disease. Most of the patients studied were unfit for coronary arteriography or for cardiac surgery because of their age or their peripheral vascular disease. In such patients, left ventricular function is often depressed,⁷ which probably permits the full exertion of the beneficial hemodynamic and antianginal effects of iv NTG.⁶

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Anesthesiology
64:410, 1986

A Potential Hazard: Interchanging Fentanyl and Sufentanil

To the Editor:—A recent probable drug administration error prompts us to share details of the episode and express a note of concern.

During a lengthy upper-extremity operation performed under axillary block, a Physical Status I, 38-yr-old man received 5 ml of fentanyl over 2.5 h initially for sedation and then, subsequently, for tourniquet pain. A second 5-ml ampul of fentanyl was ordered and 1 ml administered. Approximately 2–3 min later, the patient was noted to be apneic, cyanotic, unresponsive, and demonstrating tonic–clonic movement of the unanesthetized arm. Following an uncomplicated resuscitation, the patient breathed with a large tidal volume and a spontaneous respiratory rate of 4 breaths/min for some time thereafter. Naloxone was not given. Initially, the cause for this event was not known, but a recheck of the operating room narcotic log revealed a one-ampul surplus of fentanyl and a one-ampul shortage of sufentanil. Unfortunately, because it had been recently emptied, the glass disposal container could not provide a missing ampul of either possible drug. Consequently, we classified this as a probable, rather than certain, error.

Anesthesiology
64:410–411, 1986

In Reply:—Janssen Pharmaceutica recognizes the concern that Ward and Sanford have expressed. We have been in the process, over the past several months, of ac-

fentanyl–pancuronium anesthesia. (Letter). ANESTHESIOLOGY 63:122–123, 1985

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(Accepted for publication October 10, 1985.)

Although the ultimate responsibility for the incident described above rests with the individual who administered the drug, we believe that the manufacturer should seriously reconsider the advisability of marketing a narcotic at a concentration such that 1 ml administered by the only route suggested constitutes *the* dose, rather than an increment. Yes, numerous other drugs (*e.g.*, epinephrine, phenylephrine) are available in similarly concentrated forms, and we have seen all of these drugs involved in errors of administration, occasionally with significant morbidity. Anesthetized patients do not need an additional source for such error, convenience to the practitioner notwithstanding.

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(Accepted for publication October 17, 1985.)

quiring specially designed equipment and obtaining the necessary Food and Drug Administration (FDA) approval to market our intravenous anesthesia products in paper-

labeled ampuls. Although due diligence was used in color-coding Sublimaze® (fentanyl) Injection CII and Sufenta® (sufentanil citrate) Injection CII ampuls to make them easily distinguishable, the use of paper labels will accentuate this difference. These new ampuls will be phased in during late 1985 and early 1986.

The issue of concentration has been closely researched within the anesthesia community. Recent marketing research has shown that approximately 50% of all anesthesia practitioners dilute Sufenta®, and the rest prefer to use it in its current form (50 µg/ml). A substantial majority

of those surveyed feel that only one concentration should be available, since multiple concentrations may lead to a greater possibility of dosing errors.

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(Accepted for publication October 17, 1985.)

Anesthesiology
64:411, 1986

Subclavian Vein Catheter as a Source of Air Emboli in the Sitting Position

To the Editor:—We would like to alert readers to a complication that occurred as a result of a subclavian catheter placed *via* the “through-the-needle” technique. A very thin, 47-yr-old woman was scheduled for a posterior fossa exploration in the sitting position. Preoperatively, a 16-gauge Deseret Intracath® had been inserted without incident through a 14-gauge introducer needle *via* the right subclavian vein. Routine monitoring for a sitting craniotomy was placed, and anesthesia was uneventfully induced. There were no problems until 30 min after the dura was opened, when there was evidence of significant air emboli by typical precordial doppler sounds, a sudden decrease in end-tidal CO₂, and a drop in blood pressure. Further air emboli occurred despite packing of the wound, and so the venous catheter connections were inspected. The connections were tight but the subclavian catheter appeared to be on traction perpendicular to the axis of insertion. This had the effect of enlarging the opening around the puncture site. The traction was relieved and manual pressure applied over the puncture site with resolution of signs of air emboli. Emboli recurred after pressure over the site was discontinued; therefore, the catheter was removed, and a pressure dressing was applied. Further

emboli did not occur. The catheter was closely examined, and no cracks or leaks were found.

The air emboli appeared to result from air entrainment through the puncture site around the catheter. We speculate that use of the Seldinger technique (a catheter placed over a wire) may have avoided a tissue tunnel larger than the catheter. In addition, the short distance from skin to vein in this extremely thin patient may have made the opening of the tract more likely when lateral tension developed on the catheter. We add this to the large list of potential sources of significant air emboli.

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(Accepted for publication October 22, 1985.)

Anesthesiology
64:411-413, 1986

Multiorificed Catheter Placement with an Intravascular Electrocardiographic Technique

To the Editor:—The intraatrial position of a multiorificed catheter has been shown to be crucial for maximal air aspiration during surgical procedures that lie above the level of the heart.¹ Although chest roentgenogram confirmation of the catheter tip is classically used, the intravascular electrocardiographic (IVECG) technique²

offers safety, economy, and versatility that merit its employment. For multiorificed catheter placement, however, I found the catheter tip to be deeper radiographically in the right atrium than this technique reflected. To investigate this clinical finding, the IVECG of a multiorificed catheter was compared with that of a single-orificed cath-