



Original Contribution

A survey of anesthesiologist and anesthetist attitudes toward single-use vials in an academic medical center



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Abstract

Study Objective: To evaluate whether proper implementation of safety measures was uniform at 5 hospitals, and to elucidate motivating factors that lead to nonadherence.

Design: Electronic anonymous survey instrument.

Setting: Academic medical center.

Measurements: Of the 319 surveys sent to anesthesia providers across 5 hospitals, 89 responses were obtained. Questions addressed compliance with Centers of Disease Control (CDC) safety standards and the rationale for anesthesia providers' decisions to comply or not comply with these standards.

Main Results: 59.6% of respondents reported that they had reused vials between cases, while 40.4% had never done so. Of the 89 respondents, 63 (44%) felt that cost was the primary factor that prevented them from using entirely new medications on each case. Thirty-two (23%) reported convenience/efficiency as the reason; 11 (8%) responded that time prevented them from using entirely new medications on each case; 14 (10%) reported that the environment was a driving factor; and 3 individuals (2%) responded apathy. Eighteen (13%) responded "other" and, when asked to amplify a response, most of these individuals reported that they do use entirely new medications on each case.

Conclusions: Safe anesthetic practices were not uniform among respondents, and one of the main reasons given for noncompliance with safe standards was cost.

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1. Introduction

In 1990, the Centers for Disease Control (CDC) was notified of a surge of simultaneous and sudden infections that were investigated and linked to the appearance of a new anesthetic hypnotic known as propofol. Previously, outbreaks of postoperative infections were attributed largely to

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surgeons' habits or to the surgical procedure itself. However, this contamination was later identified as extrinsic and a direct result of improper technique by the anesthesia provider [1]. Since that time, the controversy surrounding proper aseptic techniques including multiple use of single-use vials has been widely debated and a topic of intense scrutiny by the medical field. The CDC initially stated that "intravenous medication vials labeled for single use, including erythropoietin, should not be punctured more than once" [2]. Subsequently, multiple statements have been released by the CDC reinforcing infection control and proper use of single-use vials. We aimed to answer whether this recommendation has been followed and to evaluate reasons for compliance versus noncompliance in our anesthetic community.

2. Materials and methods

After a waiver from the Emory University Institutional Review Board was obtained, an electronic survey was sent to all anesthesia providers at 5 Atlanta area hospitals (n=319). Each email address was issued a unique login, which prevented multiple responses by any individual. We obtained 89 survey responses from a variety of anesthesia providers including attending anesthesiologists (n=39), residents (n=18), fellows (n=7), anesthesiologists [certified registered nurse-anesthetists (CRNAs) and anesthesia assistants (AAs); n=21], and physician's assistants (PAs; n=4).

The survey consisted of 9 items dealing with the respondent's beliefs and reported practices as they relate to single-use vials, with a focus on propofol [Appendix 1]. The survey, designed to take less than 5 minutes to complete, was pre-tested on a group of anesthesiologists and anesthesia residents prior to distribution. Initial invitations to participate in the survey were sent via email; a repeat request was sent to nonresponders approximately one week later.

3. Results

Of the 319 anesthesia providers polled, 89 responded to the survey. Data were collected and analyzed using simple statistical methods. Of the 89 respondents, most (43.8%) were anesthesia attendings. Eighteen (20.2%) respondents were residents, 15 (16.9%) were CRNAs, 7 (7.9%) were fellows, and 6 (6.7%) were AAs. Four PAs made up the smallest group of respondents (4.5%) (Table 1). There were no significant differences in the response rate across groups ($P > 0.05$ for all groups surveyed).

3.1. Expired propofol

When asked, "What infectious organism are you most likely to transmit by using expired propofol?" the majority of respondents (64%) replied correctly that staphylococcus was

Table 1 Response rate

Job Title	Polled	Responded	Response rate	P-value
Attending anesthesiologist	114	39	34.2%	0.72
Fellow	15	7	46.7%	0.70
Resident	47	18	38.3%	0.71
Anesthetist	137	21	15.3%	0.44
PA	6	4	66.7%	0.79
Total	319	89	27.9%	

PA=physician's assistant.

the organism most likely to be transmitted when using expired propofol. Fifteen (17%) responded that candida was most likely to be transmitted, 14 (16%) said enterobacter, 3 (3%) responded serratia, and no anesthesia providers believed that moraxella was the organism most likely to be transmitted by using expired propofol.

3.2. Alcohol-wiping

When asked, "Do you wipe the top with alcohol before piercing the vial?" most anesthesia providers (70.8%) responded that they do not wipe the vial with alcohol and 29.2% do wipe the vial with alcohol prior to piercing it.

3.3. Perspectives on safety

When asked to rank on a scale of 1–5 whether a certain practice was safe or unsafe, most (51.2%) felt that using syringes premade or predrawn from the pharmacy would be very safe. Most respondents seemed to think that using one vial on multiple patients and piercing a propofol vial multiple times with different syringes would be a less safe behavior. However, transferring unused syringes from one patient to be used on another patient and connecting a sterile intravenous (IV) line directly to the central line of a patient who had their line placed in the intensive care unit (ICU) two days earlier, both appeared to be considered moderately safe behaviors (Table 2).

3.4. Incidence of re-use

When asked whether they had ever re-used vials between cases, 59.6% of anesthesia providers responded that they had done so, and 40.4% had never done this in their practice. (Fig. 1).

3.5. Reasons for re-using materials

Of the 89 respondents, 63 (44%) felt that cost was the primary factor that prevented them from using entirely new materials on each case; 32 (23%) reported convenience/efficiency as the reason for re-using materials; 11 (8%)

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