Journal of Addictive Diseases, 29:282–283, 2010
ISSN: 1055-0887 print / 1545-0848 online
DOI: 10.1080/10550887.2010.490467

Routledge
Taylor & Francis Group

Reservations Concerning Second-Hand Fentanyl Exposure in the Operating Room

We are aware of the controversy that Dr. Gold's report of trace levels of fentanyl and propofol in the air of surgical rooms has evoked.[1–4] Drug dependence among surgical and anesthesiology staff is a serious and complex issue, and we acknowledge the potential for generation of bioaerosol containing narcotics during surgery. Our study was an examination of room air during cardiovascular surgeries in a local hospital to quantify the level of "second hand" fentanyl,[5] a similar setting to that previously reported.[6]

Our findings are relevant to fentanyl only; we did not study or attempt to measure propofol. Our manuscript carefully detailed our sampling and analytical methodologies. We sampled an approximate 780-fold greater air volume and used instrumentation of equal sensitivity and better specificity to that reported by Dr. Gold. We are confident that if fentanyl-containing bioaerosol were present in the vicinity of the anesthesiology station at levels previously reported,[5] we would have been able to quantify it.

During the cardiovascular surgical procedures in our study, exhaled patient breath was filtered and scavenged, undoubtedly eliminating a large portion of any available fentanyl from this source.[5] From our experience and those reported by others, non-specific binding of fentanyl to materials would decrease, if not eliminate, available fentanyl.[5,7] In the settings we sampled, available fentanyl that would be produced in mechanically generated bioaerosols would be concentrated at the point of generation, putting surgeons and surgical technicians at greatest risk for exposure, not anesthesiologists. Furthermore, the minimum room ventilation rates for surgical suites would quickly dilute and remove aerosols, along with available fentanyl. Even though different facilities were sampled, operating room ventilation systems are universally designed based on standards, such as ANSI/ASHRAE/ASHE Standard 170-2008, to optimize the removal of contaminants around the surgical site. We believe it to be highly unlikely that similar fentanyl levels would be found from such diverse sources as exhaled breath, general room air, and the headspace above a sharps container. Fentanyl is not a volatile chemical and should not off-gas from blood-contaminated surfaces.

Based on our pharmacokinetic and room air dilution calculations and our empirical observations,[5] we feel the potential for quantifiable, significant, wide spread "second-hand" fentanyl aerosol exposure in surgery rooms to be unlikely.

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