

A Weekly FAX from the Center for Substance Abuse Research

University of Maryland, College Park

## *Anesthesiologists' High Rate of Opiate Abuse and Dependence May Be Related to Passive Exposure in the Operating Room*

Occupational exposure to harmful substances is very common but rarely studied among health professionals. In the operating room, second-hand exposure to nitrous oxide was identified in the 1950s and monitors were ultimately installed to reduce exposure. Intravenously administered agents, which were presumed to not enter the operating room environment, were subsequently introduced. However, recent research by Mark Gold, M.D., and colleagues at the McKnight Brain Institute at the University of Florida suggests that the aerosolization of intravenously administered anesthetics (such as propofol) and analgesics (such as fentanyl) may be an unintended source of passive opiate exposure in the operating room.<sup>1,2</sup>

According to Dr. Gold and colleagues, anesthesiologists are significantly overrepresented among Florida physicians with substance use disorders (SUDs). In 2003, 5.6% of licensed Florida physicians were anesthesiologists, yet they represented 23% of physicians who were followed for SUDs.<sup>1,2</sup> Opiate abuse, in particular, is a significant problem among anesthesiologists. For example, 94% of the physicians who abused or were dependent on the synthetic narcotic fentanyl were anesthesiologists or surgeons.<sup>3</sup> While increased access to opiates is one possible explanation for increased opiate abuse among anesthesiologists, other medical specialists with similar access to opiates do not show the rates of abuse and dependence seen in anesthesiologists.<sup>2</sup> An alternative explanation, proposed by Dr. Gold, is that anesthesiologists become sensitized to opiates through repeated second-hand exposure in the operating room.<sup>2,4</sup> Sensitization makes brain pathways become more responsive to a drug of abuse and thus makes opiate experimentation more likely, compelling, and lethal.<sup>1,4</sup> Dr. Gold notes that "sensitization through exposure has explained other clusters of environmental addiction findings; alcoholism among house painters and smoking in offspring of smokers."<sup>5</sup>

To test his hypothesis and to identify potential for exposure, Dr. Gold collaborated with the University of Florida's nanotechnology group to develop mass spectrometry assays to detect the presence of low levels of fentanyl and propofol in the air.<sup>2</sup> Despite the fact that they are administered intravenously, these potent drugs were present not only above the patient's mouth, but throughout the operating room.<sup>1,3,4</sup> Thus, anesthesiologists and other operating room personnel may be at risk for passive opiate exposure, especially during long procedures where high doses are used, such as open heart surgery.<sup>3</sup> Further studies of the air in the intensive care units, emergency rooms, and operating rooms are needed to determine the extent of potential exposure. Whether airborne fentanyl can be measured in the blood of anesthesiologists and change the anesthesiologist's brain during surgery is currently under study.<sup>1,3</sup> The researchers caution that while these data are preliminary, anesthesiologists are wise to limit the potential for second-hand exposure to fentanyl. They should take breaks, change masks frequently, and open and discard fentanyl vials under a hood.<sup>1,3</sup> In addition, a new look is warranted at operating room air handling systems, which do not appear to have kept pace with the evolution of analgesics.

SOURCE: A complete list of sources is available online [<http://www.cesar.umd.edu/cesar/cesarfax/vol14/14-27.pdf>]. For more information, contact Dr. Gold at [msgold@psychiatry.ufl.edu](mailto:msgold@psychiatry.ufl.edu).

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## Source List

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### *Anesthesiologists' High Rate of Opiate Abuse and Dependence May Be Related to Passive Exposure in the Operating Room*

- <sup>1</sup>Gold MS, Melker RJ, Dennis DM, Morey TE, Bajpai LK, Pomm R, Frost-Pineda K, "Fentanyl Abuse and Dependence: Further Evidence for Second Hand Exposure Hypothesis," *Journal of Addictive Diseases* 2005. In Press.
- <sup>2</sup>Gold MS, Fuehrlein B, Frost-Pineda K, Pomm R, Melker RJ. "Is Addiction and Occupational Hazard for Anesthesiologists?" College on the Problems of Drug Dependence (CPDD) Annual Meeting, San Juan, PR, June 15, 2004. Available online [<http://www.psychiatry.ufl.edu/research/Addiction/addictpubindex.htm>].
- <sup>3</sup>Frost-Pineda K, Melker RJ, Pomm R, Morey T, Dennis D, Gold MS. "Sensitization in the Operating Room: Fentanyl Exposure, Abuse and Dependence," CPDD Annual Meeting, Orlando, FL. June 21, 2005. Available online [<http://www.psychiatry.ufl.edu/research/Addiction/addictpubindex.htm>].
- <sup>4</sup>Gold MS, Byars JA, Frost-Pineda K. "Occupational Exposure and Addictions," *Psychiatric Clinics of North America* 27(4):745-53, 2004.
- <sup>5</sup>Gold MS, Dennis DM, Morey TE, Frost-Pineda K, Melker RJ. "Addiction Is an Occupational Hazard for Anesthesiologists: How and Why?" American Society of Anesthesiologists Annual Meeting, New Orleans, LA, October 25, 2004. Available online [<http://www.psychiatry.ufl.edu/research/Addiction/addictpubindex.htm>].