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## Evidence of addiction by anesthesiologists as documented by hair analysis.

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Chemical dependency is a disease that can affect all professions. Among the health care professionals, anesthesiologists represent a specific group. Numerous factors have been proposed to explain the high incidence of drug abuse among anesthesiologists. These include: easy access to potent drugs, particularly narcotics, highly addictive potential of agents with which they are in contact, and easy diversion of these agents since only small doses will initially provide an effect desired by the abuser. Opioids are the drugs of choice for anesthesiologists, and among them fentanyl and sufentanil are the most commonly used. Alcohol is mostly abused by older anesthesiologists. Propofol, ketamine, thiopental and midazolam are also abused. In fact, all but quaternary ammonium drugs can be observed. Signs and symptoms of addiction in the hospital workplace include: unusual changes in behavior, desire to work alone, refusal of lunch relief or breaks, volunteer for extra cases, call, come in early and leave late, frequent restroom breaks, weight loss and pale skin, malpractice, behind on charts .... Toxicological investigations are difficult, as the drugs of interest are difficult to test for. In most cases, half-lives of the compounds are short, and the circulating concentrations weak. It is, therefore, necessary to develop tandem mass spectrometry procedures to satisfy the criteria of identification and quantitation. In most cases, blood and/or urine analyses are not useful to document impairment, as these specimens are collected at inadequate moments. Hair analysis appears, therefore, as the unique choice to evidence chronic exposure. Depending the length of the hair shaft, it is possible to establish an historical record, associated to the pattern of drug use, considering a growth rate of about 1cm/month. An original procedure was developed to test for fentanyl derivatives. After decontamination with methylene chloride, drugs are extracted from the hair by liquid/liquid extraction after incubation in pH 8.4 phosphate buffer. Fentanyl derivatives are analyzed by GC-MS/MS. The following cases are included in this paper: Case 1: 50-year-old anesthetist, positive for fentanyl (644 pg/mg); Case 2: 42-year-old anesthetist, positive for fentanyl (101 pg/mg) and sufentanil (2 pg/mg); Case 3: 40-year-old anesthetist, positive for codeine (210 pg/mg), alfentanil (30 pg/mg) and midazolam (160 pg/mg); Case 4: 46-year-old nurse, found dead, positive for alfentanil (2 pg/mg) and fentanyl (8 pg/mg). In these cases, the combination of an alternative specimen (hair) and hyphenated analytical techniques (tandem mass spectrometry) appears to be a pre-requisite.

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