K13 The Second Seven Years of the FAA's Postmortem Forensic Toxicology Proficiency- Testing Program

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After attending this presentation, attendees will have an awareness of the FAA postmortem forensic toxicology proficiency testing program its impact to the PT participants during its second seven years of existence.

This presentation will impact the forensic community by informing attendees of the positive benefits of accreditation and quality control/quality assurance for those who participate in the program.

Attendees will be acquainted with the analytical findings of survey samples of the Federal Aviation Administration's (FAA's) postmortem forensic toxicology proficiency-testing (PT) program.

For aircraft accident investigations, samples from pilot fatalities are analyzed at the FAA's Civil Aerospace Medical Institute (CAMI) for the presence of combustion gases, alcohols/volatiles, and drugs. Throughout this forensic toxicological process, a high degree of quality control/quality assurance (QC/QA) is maintained, and quality improvement is continuously pursued. Under this philosophy, CAMI started a quarterly forensic toxicology PT program in July 1991 for the analysis of postmortem specimens. In continuation of the first seven years of the CAMI PT findings reported earlier, PT findings of the next seven years (July 1998–April 2005) are summarized herein. During this period, 28 PT challenge survey samples (12 urine, 9 blood, and 7 tissue homogenate) with/without alcohols/volatiles, drugs, drug metabolites, and/or putrefactive amine(s) were submitted to an average of 31 participating laboratories, of which an average of 25 participants returned their result sheets—that is, 53–96% (mean = 82%). The number of respondents was dependent upon the complexity of the sample matrix, the number and types of analytes in the sample, and the associated analytical chemistry/toxicology. For example, ethanol/methanol/volatiles in urine were correctly quantitated by a higher number of participants than those for amphetamine/methamphetamine and cannabinoid levels in blood and tissues. Methods employed ranged from immunoassays to gas chromatography-mass spectrometry/high performance liquid chromatography. Analytes in survey samples were correctly identified and quantitated by a large number of participants, but some false positives of concern were reported as some of them were abused drugs. Some of the false positives would have been avoided by not reporting those drugs solely based upon qualitative analyses. Their presence should have been confirmed, authenticated, and, if possible, quantitated by other analytical methods, which should have been based upon different analytical principles than those used during qualitative analyses. It is anticipated that the FAA's PT program would continue to serve as a tool to effectively allow its own toxicology laboratory and other participating laboratories for professional and technical maintenance and advancement on a voluntary, interlaboratory, and self- evaluative basis. Furthermore, this PT program will continue to provide service to the forensic toxicology scientific community through this important part of the QC/QA for the laboratory accreditation to withstand professional and judicial scrutiny of analytical results.

This presentation will summarize the PT results of the participating laboratories in the field of forensic toxicology. By understanding those survey results and applying related necessary procedures, the overall performance of a laboratory should improve. Participation of laboratories in external PT programs is a realistic approach for continuous quality improvement.

Toxicology, Proficiency-Testing, Quality Improvement

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