



### **K22 Flight Activity and Drug Use: Legislation and Toxicological Statistics From 2006 – 2012 at the Rome Medical Legal Institute of the Italian Air Force**

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After attending this presentation, attendees will understand the medical assessment of commercial pilots and cabin crews, which has two main purposes: (1) to assess their functional ability; and, (2) to ascertain whether they are physically able to safely exercise the privileges of their licenses and to verify the risk of incapacitation during the period of validity of the medical certificate.

This presentation will impact the forensic science community by demonstrating the importance of continuous surveillance of commercial pilots and cabin crews. As this study confirms, the percentage of drug users in this category of workers is very low.

The goal of this presentation is to describe the experience of the Italian Air Force Medicolegal Institute of Rome and the Forensic Laboratory of the Catholic University regarding the medical assessment of commercial pilots and cabin crews.

**Materials and Methods:** The total number of Class 1 and 2 medical examinations undertaken during a six-year period from January 2006 to the first semester of 2012 was taken from the Italian Air Force Medicolegal Institute of Rome medical records database.

The normative references in the relevant period regarding personal fitness to fly are: Italian Presidential Decree n. 566 November 18, 1988; JAA JAR-FCL 3 Flight Crew Licensing (medical) Amendment 5, December 1, 2006.

Urinary screening for the qualitative detection of drugs was carried out using the immunochemical technique Kinetic Interaction of Microparticles in a Solution (KIMS). The following substances were tested for: amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, and opiates. All samples were processed to guarantee chain of custody, obliging operators to document the different stages of the sample. Samples were separated into two aliquots (sample and counter-sample) and closed in front of the patient with a tamper-proof seal signed by the healthcare operator and the patient. The counter sample of urine that tested positive in a preliminary analysis was kept in the freezer at -20°C for 60 days, to be used in case any medical-legal disputes arose.

**Results:** The results of preliminary analysis of the urinary specimens were then examined and elaborated. Data review allowed the evaluation of the sample distribution by gender, age, drug substance type, with subsequent confirmation by Gas Chromatography/Mass Spectrometry (GC/MS). Within the positive samples, analyzed using the KIMS, the gender distribution is almost equal (five male subjects, compared to four female subjects) with an age range of 19 – 50 years.

In the relevant period, of 7,530 subjects tested for drug use (only extraordinary medical examination), nine were positive to KIMS screening. Among the positive subjects, none were polydrug users. Distribution of positive results for drugs indicated a clear prevalence of cannabinoids (eight subjects, or 89%). Only one positive case was detected for cocaine (11%) and no samples were positive for barbiturates, benzodiazepines, amphetamines, or opiates.

The cases that were positive after urinary screening, and their samples, were then subjected to confirmation by GC/MS. Of the nine positive cases, five cases (equal to 56% of all positive) haven't been confirmed. In the four confirmed cases, one was detected for cocaine and three for cannabinoids.

**Discussion and Conclusion:** Thanks to the continuous surveillance of commercial pilots and cabin crews, the study shows that the percentage of drug users is very low; therefore, this result indicates that it is appropriate to continue this strict type of monitoring. This phenomenon should not be underestimated since it can influence the ability of individuals who are responsible for the safety of others.

**Substances of Abuse, Italian Air Force, Toxicological Investigation**