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Drug Testing for Cockpit Crew

Although the debate continues about random drug testing of crew members, the author notes there is still a need for continued education programs for flight crews on drug use, drug abuse, drug dependence and drug addiction.

by

Stanley R. Mohler, M.D.

The regulatory authorities in the United States are moving toward requiring mandatory periodic and random drug screening tests of cockpit crew members' urine (1). These tests are to be aimed at detecting in urine the presence of five types of substances: amphetamines, opiates, cocaine, marijuana and phencyclidine (PCP). The concept underlying this push derives from regulatory authority belief that some airline pilots and flight engineers, as well as corporate and certain other commercial pilots, may be dependent on, addicted to or abusing various drugs in the above categories. Considering U.S. commercial aviation, toxicological investigation of accidents has found relatively little evidence of cockpit crew involvement with the above substances (2). In fact, with respect to accidents, the FAA could only cite suggestive preliminary data for a cocaine metabolite in the pilot of a January 19, 1988, crash at Durango, Colo., and low levels of a marijuana metabolite in the toxicological tests of the pilots of a Learjet that crashed March 30, 1983, at Newark, N.J. (3) These may be the result of false positive tests.

This discussion will explore the pros and cons of mandatory periodic and random urine drug testing in regard to cockpit crew members. It will also emphasize the need for repeated crew member education programs on the topics of drug use, drug abuse, drug dependence and drug addiction.

Concepts and Definitions

The regulatory authorities have recognized the potential threat to flight safety by a cockpit crew member in regard to "substance" use that may cause a diminished capacity to perform properly. Alcohol, as a substance of abuse and addiction, began receiving specific attention in this respect in the United States in the mid-1970s.

Today, more than 1,000 airline cockpit crew members who became "alcoholics" have, following specialized inpatient treatment for a period of time (in some cases, two to three months) and certain other requirements, been returned to full flight duty (3). The application of modern scientific, medical and performance tests, including simulator, and, or, inflight assessments (to assist in ascertaining that the alcoholic crew member has not suffered permanent central nervous system or other organ system impairment), has enabled the return to duty of these no longer alcohol-imbibing crew members.

In regard to use, and, or, dependence, on substances other than alcohol (note: not uncommonly, an abuser of

alcohol will be found to substitute another drug when alcohol is not available, or, in some instances, intermingle alcohol with various drugs), the U.S. regulatory authorities are less comfortable understanding the matter.

The authorities, therefore, decided to move toward a requirement for mandatory periodic and random urine testing for drugs. The requirement is aimed at identifying possible problem cases before these become obvious through behavior changes or through an accident investigation. In the case of alcohol, no such testing moves were, or have been, made. However, the FAA did augment the operating regulations to authorize law enforcement officers to request a test for alcohol on any crew member whom the FAA suspects is "under the influence" or has otherwise violated the FAA alcohol regulations (Federal Aviation Regulation 91.11).

FAA Alcohol and Drug Regulations

Part 91.11 of the FAA Federal Aviation Regulations requires that crew members of civil aircraft will not "act as a crew member of a civil aircraft while using any drug that affects the person's faculties in any way contrary to safety."

The regulation also provides that the FAA will have access to the results of each positive toxicological test for drugs that is taken by a hospital, clinic or other facility that was taken within four hours of acting (or attempting to act) as a crew member (some provisions in the regulation relate to alcohol).

Up-to-date detailed educational and advisory information from the FAA for pilots relative to the 91.11 regulations is virtually nonexistent.

Modern Medical Definitions

The leading psychiatric authorities in the United States have developed the current definitions of substance dependence in the Diagnostic Standards Manual, the latest version known in abbreviated form as DSM-III-R (4). Their current thinking is articulated as follows:

"In our society, use of certain substances to modify mood or behavior under certain circumstances is generally regarded as normal and appropriate. Such use includes recreational drinking of alcohol, in which a majority of adult Americans participate, and the use of caffeine, in the form of coffee or tea, as a stimulant.

"On the other hand, there are wide cultural variations. In some groups even the recreational use of alcohol is frowned upon, whereas in other groups the use of various illegal substances for mood-altering effects has become widely accepted. In addition, certain psychoactive substances are used medically for the alleviation of pain, relief of tension or to suppress appetite."

The authors of DSM-III-R point out that "maladaptive behavioral changes are associated with a more or less regular use of psychoactive substances that affect the central nervous system." They view these behavioral changes as extremely undesirable.

The Meaning of Having A Dependency

Substance "dependence" for a given individual is defined in DSM-III-R as including one or more of the following symptoms:

1. The person takes a psychoactive substance in larger amounts or during a longer period than originally intended.

2. The person recognizes that the substance use is excessive, and may have attempted to reduce or control it, but has been unable to do so (as long as the substance is available).

3. DSM-III-R states: "A great deal of time is spent in activities necessary to procure the substance (including theft), taking it or recovering from its effects. In mild cases, the person may spend several hours a day taking the substance but continue to be involved in other activities."

4. DSM-III-R states: "The person may suffer intoxication or withdrawal symptoms when he or she is expected to fulfill major role obligations (work, school, homemaking). For example, the person may be intoxicated when working outside the home or when expected to take care of his or her children. In addition, the person may be intoxicated or have withdrawal symptoms in situations in which substance use is physically hazardous, such as driving a car or operating machinery."

5. "Important social, occupational, or recreational activities are given up or reduced because of substance use."

6. "With heavy and prolonged substance use, a variety of social, psychological and physical problems occur, and are exacerbated by continued use of the substance. Despite having one or more of these problems (and recognizing that use of the substance causes or exacerbates them), the person continues to use the substance."

7. DSM-III-R points out that significant tolerance occurs with continued use of the same amount of the sub-

stance. The person will then take greatly increased amounts of the substance in order to achieve intoxication or the desired effect.

8. Characteristic withdrawal symptoms develop when the user stops or reduces intake of the substance.

9. Following the development of unpleasant withdrawal symptoms, the user begins taking the substance in order to relieve or avoid those symptoms. This typically involves using the substance throughout the day.

Specific Considerations

The FAA proposes "qualitative" urine test cut-offs for the five target drugs listed in the new regulation as shown in Figure One. For a urine specimen that tests "positive" in the qualitative test, the FAA proposes the quantitative cut-offs shown in Figure Two.

The following considerations are basic to the question of urine drug testing for cockpit crews. The performance record shows that the vast majority of pilots and flight engineers are highly professional, motivated individuals, who have trained for considerable periods of time and who act responsibly and safely. Cockpit crew members have demonstrated a general disdain regarding the use of illicit drugs. With respect to drug abuse in general, aircraft accident toxicological data, as previously cited, do not identify a "crisis" circumstance, especially when the "false positive" aspect of drug analysis is taken into consideration.

False positive tests result from a number of underlying causes (a false positive test is one that indicates the presence of a given substance when the substance is not present). First, there are the problems of improper labeling and sample mix-ups. A given person's "sample" that is free of specific drugs is found on both the highly sensitive screening test and the highly specific follow-up test to be positive, but, as it happens, the sample is not from the named person.

Second, sample contamination is an ever-present error possibility, as is an error of toxicologic technique. Third, errors in reporting, including spurious reporting (note: the FAA found within its own employees, as recently as 1987, a laboratory chemist who deliberately rendered a spurious toxicological report in regard to a transportation accident), can identify a number of innocent individuals as "guilty" within a population of thousands, ruining the careers of the incorrectly identified persons.

Collection, laboratory screening and reporting programs are operated by humans (often the lowest bidder), and, as, such, are susceptible to a certain number of periodic ongoing errors. The FAA has already discovered this in regard to a contractor for an in-house urine testing program, forcing cancellation of the contract.

In addition to these reasons, there are other valid ones why a crew member may be found to be taking certain drugs that would appear on a random screening test. For example, Dr. Anthony Nicholson has devised a schedule for crew members relative to the prescribed use of certain hypnotics, including benzodiazepines, as an aid to achieving sleep (5). His recommendations are widely disseminated for use by the world's aircrews. Benzodiazepines are not included in the presently proposed regulation, but many drug screening programs do detect these substances, and decisions will have to be made in respect to their presence, if found.

State of the Threat

Certain segments of the U.S. public, including regulatory authorities in civil transportation, currently perceive that the level of cockpit crew member abuse, dependence or addiction, to illicit substances, narcotics or other drugs, constitutes a pervasive threat to civil aviation safety. Accordingly, there is under way a move to subject all cockpit crew members to periodic and random urine testing for listed, potentially detrimental, substances that some crew members may be consuming.

The proposed urine drug testing program for individual aircrew members is derived from the frustrations generated among responsible citizens by those persons who become involved with drugs and develop personality, behavior and adverse health changes. Individual crew members through the selection of a conscious lifestyle that avoids abuse of mind and health alerting substances are the strongest barrier to official concern. In other words, if there is not a drug abuse problem among crew members, it will become apparent that there is no need for the heavy costs required to administer the drug testing program.

It is vital that all crew members perform and behave in a fashion within and outside of their workplace that excludes the use or abuse of the listed substances, and communicates in general a clear stance against any improper drug or substance use.

Regulatory authorities, pilot associations and employers can actively conduct education programs that incorporate integral crew member participation. These activities should include peer interactions and the dissemination of information on the availability of employee assistance programs. ♦

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About the Author

Stanley R. Mohler, M.D., is a professor and vice chairman at Wright State University School of Medicine in Dayton, Ohio, U.S. He is Director of Aerospace Medicine at the university.

Mohler, who is an air Transport Pilot and certified flight instructor, spent five years as director of the U.S. Federal Aviation Administration's Civial Aviation Medicine Research Institute, and an additional 13 years as FAA's Chief of Aeromedical Applications Division.

He has written books on pilot medications, as well as one about aviator Wiley Post. He is a frequent contributor to Flight Safety Foundation's publications and other aviation publications.

Figure One
The FAA Urine Drug Tests

Initial Screening Test — Type: Immunoassay Method (Qualitative) Determine Presence of Substance

Substance	Positive Level ng/ml*
Marijuana metabolites	100 or more
Cocaine metabolites	300 or more**
Opiate metabolites	300 or more
Phencyclidine	25 or more
Amphetamines	1,000 or more

*ng= nanogram = one billionth of a gram

** 25 ng/ml if the immunoassay is specific for free morphine

Figure Two
The FAA Urine Drug Tests

"Confirmatory" Test — Type: Gas Chromatography — Mass Spectometry Method (Quanitative) Determines Amount of Substance

Substance	Analytic Levels ng/ml
Marijuana metabolite*	15 or more
Cocaine metabolite**	150 or more
Opiates	
Morphine	300 or more
Codeine	300 or more
Phencyclidine	25 or more
Amphetamines	
Amphetamine	500 or more
Methamphetamine	500 or more

* Delta-9-Tetrahydrocannabinnol-9-carboxylic acid
** Benzoylecgonine

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