Drug and alcohol testing. Is urine testing still best?

asks **Dr Dan Hegarty,** director, **Express Medicals Limited**

An important aspect of Project Sentinel is the seriousness placed upon medical fitness, including drug and alcohol testing, by the railway industry. Indeed, since 1st September, 2002, it has been mandatory for candidates attending PTS courses to provide documentary proof that they have passed both a PTS medical and a pre-employment drug screen before "the commencement of the first day of training".

With such importance being placed upon the role of testing, it is not surprising that a debate has developed as to which is the "best" method of collection and testing. Urine testing is the standard method in the railway industry and this position will remain unchanged during the foreseeable future. Urine testing has been upheld as the currently favoured method by both the HSE and Railtrack.

On 1st July, 2002, members of "ARIOPS" (Association of Railway Industry Occupational Physicians) heard Scientifics Limited toxicologist, Fiona Coope, deliver a balanced analysis of the technical merits of urine collection/testing as compared to a newer method which uses a mouth swab to collect fluid samples (OMT/oral mucosal transudate) from the inner sides of both cheeks. For further information on this method please refer to Paul Hunter's article in the July-August 2002 edition of "Railway Strategies".

Some of the problems faced by the "OMT" method include the following:-

1. Samples that are collected by absorbing an oral fluid onto a mouth swab will not have a known sample volume. This makes it impossible to obtain standardised "cut-off" values for the various drugs to be tested and so it is impossible to achieve standardised results. This is because one does not know exactly how much of the sample was collected in the first place. Without standardised cut-off levels you cannot define values that will result in a test being judged as positive or negative. For example, in the case of cannabis there may be a small amount of the drug present because of passive / secondary smoking. Having an agreed, standardised cut-off level means that this effect will be taken into account when interpreting the result as a pass or fail. This is not currently possible with "OMT" testing.

2. There are no internationally accepted guidelines for "OMT" testing. Urine testing has the current advantage of being backed up by many years of research on the subject of workplace testing in America, the UK and Europe. With urine testing there is thus a well-researched methodology that allows a high quality, formalised accreditation process to be applied to laboratories wishing to undertake workplace testing. The accreditation of testing laboratories is essential because it establishes that a laboratory both functions well internally and stands up to vigorous blind analysis tests.

3. The use of an oral fluid has attractions in terms of simplicity, convenience and the integrity of the "chain of custody" collection method. However, just as urine collections are not perfect, so there are problems and pitfalls with the "OMT" sampling. Examples are:-

a. A sample collected onto a swab cannot be divided into two so that the donor can later challenge the result by having the stored half of the sample re- analysed. This is a fundamental flaw of the "OMT" sampling method.

b. Conditions affecting the mouth, such as a blocked salivary gland on one side, means that two samples collected at the same time will not be duplicates. This will invalidate any attempt to perform a confirmatory test on the second sample.

c. "OMT" samples are not comparable to samples of saliva (which is another type of oral fluid). The interpretation of results will be different from these sample types. Again, there are no international guidelines to provide standardised comparability of results.

d. "OMT" sampling does not avoid the problem of adulteration / contamination. At its simplest level, changes in the local conditions of the mouth may alter the ease with which one or more drugs enters the oral fluid (eg: as a result of chemicals placed in the mouth). Care must be taken to ensure that the donor has not been in the presence of anybody who has been smoking or drinking alcohol (to avoid the possibility of passive deposition on the floor of the mouth). The donor should be observed not to be taking anything by mouth for at least 20 minutes before an oral fluid sample is collected and the mouth needs to be thoroughly examined.

e. "OMT" samples may be diluted. For example, a hidden pouch of water could be burst by biting on it around the time of sampling. A small amount of water could very significantly alter the concentration of the sample collected. Analysis will be further complicated by the relative dryness/ salivation of the donor's mouth.

As with urine testing, there are already tips on how to outwit the collection and testing methods on the internet. Collectors and laboratories will need to be wise to the deficiencies of the method and do their utmost to minimise cheating.

For many technical reasons, urine testing remains the favoured method at the present time. However, the role of oral fluid testing, whether "OMT" and/or saliva, seems likely to be established in the future. But more research is needed to establish international standards in the interpretation of results obtained from oral samples.

There is one very large problem to overcome in relation to "OMT" testing. There must be a single sample that can be divided in half in the presence of the collector to enable future testing of a true duplicate sample. How this can be overcome is difficult to imagine. It must be possible to measure the original sample volume that is collected if meaningful cut-off levels and standardised interpretations are to become feasible. Again, it is difficult to see how. International guidelines will need to be drawn up to enable accreditation of testing laboratories, challenge analysis and legally defensible results.

"OMT" testing is a new technology that offers an exciting prospect for the future. However, at this moment in time, urine remains the best method for legally defensible analysis.

We watch this space with anticipation.....

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