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# Hair Testing *vs.* Traditional Drug Testing Procedures

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## Introduction

Since the 1990s, drug testing of the hair has been widely used in forensics to gather solid evidence of drug consumption. Hair is the only specimen that can provide chronological information on individual drug use, in addition to having longer detection windows. The majority of drugs and hypnotics that are used in crimes are illegal drugs. In drug-facilitated crimes, they are typically examined to demonstrate drug use or addiction. In order to properly interpret the results of hair analysis, extensive research has been conducted on the mechanism by which drugs are incorporated into hair. Despite the growing use of hair tests, the exact mechanism is still the subject of much debate. The incorporation pathways of drugs into hair have recently been investigated by the authors by utilizing liquid chromatography-tandem mass spectrometry (LC-MS/MS) and sectional hair analysis of 1-mm segments using matrix-assisted laser desorption/ionization-mass spectrometry (MALDI-MS). Drug incorporation occurs in two areas of the hair root: the hair bulb and the upper part of the hair root, according to time-course changes in drug distribution along single-strand hair [1]. This suggests that incorporation from the hair bulb continues for approximately two weeks. The main incorporation pathway (via the hair bulb or the upper part of the hair root) differs depending on the drug's or metabolite's properties, as shown by the distribution profiles of various drugs in hair. When discussing an individual's drug use history based on hair analysis results, these findings should be considered.

## Description

Valid and reliable drug tests are required because substance abusers must demonstrate abstinence prior to transplantation. Fearing that surgery will be delayed, patients may refuse use. Patients can evade detection during breath, blood, and urine tests because they have brief detection windows. Not all substances of abuse are included in routine laboratory tests. These obstacles are removed by hair analysis, which makes it more likely that active users will be identified. Based on 445 self-report, breath, urine, and hair samples from 42 patients who had been denied a transplant due to recent substance abuse, this study compared results for alcohol, opioids, and cocaine. Conventional drug tests had a lower sensitivity for alcohol and moderate sensitivity for cocaine and opioids than hair toxicology. Only half of the hair tests that came back positive were supported by other tests. Interestingly, particularity was high across tests and substances, with positive discoveries from ordinary tests affirmed through hair toxicology [2]. Two negative hair analysis tests suggest six months of continuous abstinence based on a 90-day detection window. Whether as a routine procedure or when the veracity of conventional tests' findings are in question, hair testing should be considered as an alternative method for monitoring substance use in the transplant population.

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If a person was between the ages of 18 and 29 and spoke English, lived in New York City, reported using heroin or prescription opioids for nonmedical purposes more than three times in the past 30 days, they were eligible. A multi-modal screening protocol that included urine testing for methadone, opiates (i.e., heroin, morphine, codeine), and oxycodone using a point-of-care device (described below), a visual prescription opioid pill identification quiz, and, for those who reported recent drug injection, a visual check for injection marks were used to confirm recent opiate/opioid use in addition to self-report. If they correctly identified at least three opioid pills in the visual quiz and/or had visible evidence of recent injection, individuals whose urine samples did not indicate recent opiate/opioid use (within approximately the past 1–4 days) may still be eligible. Participants completed structured computer-assisted interviews after giving informed consent. The Institutional Review Board of the NDRI approved the study [3].

Although testing for the presence of fentanyl in drug samples and urine can provide useful information about recent exposure, additional testing methods are required to address the limitations of these methods. Based on our previous research, hair testing is the best biological matrix for obtaining a comprehensive exposure history of novel psychoactive substance usage. Although hair testing does not provide immediate results or detect very recent exposure (for example, just a few days after use), it does allow for extensive monitoring of drug exposure over long periods of time. People who use heroin or other drugs that have the potential for fentanyl adulteration may benefit from having a longer history of exposure when it comes to prevention or harm reduction [4].

For the purpose of workplace testing, recent advancements in analytical methods have made it possible to detect drugs and drug metabolites in alternative biological specimens. There are a lot of different specimens to choose from, and each one can tell you a lot about past or current drug use. Hair, sweat, and oral fluid (saliva) are the current focus. The Division of Workplace Programs of the Department of Health and Human Services is currently conducting a comprehensive evaluation to determine whether or not these specimens can be used in federally regulated programs. In the years to come, alternative specimen testing will become standard practice in all forensic toxicology fields and will improve our comprehension of drug use patterns [5].

## Conclusion

When opiate/opioid-using samples are tested for past-month use of specific drugs, hair testing appears to be less effective than urine testing, despite the fact that hair testing is effective in detecting drug use in wide window periods (such as use in the past year). However, it appears that hair testing is particularly effective at detecting unreported recent use of cocaine and/or oxycodone, and it frequently enhances urine's detection power. We believe that incorporating hair and/or urine testing into surveys can assist in "correcting" prevalence estimates that are influenced by unreported use.

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None.

## Conflict of Interest

The authors declare that there is no conflict of interest associated with this manuscript.

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