

Hair Testing for Drugs — Challenges for Interpretation

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ABSTRACT: While testing hair for drugs of abuse has become more widely used in the past 30 years, significant challenges still remain to the interpretation of the results from these tests. Of primary concern is the likelihood of unwitting contamination from the environment producing a result indicative of drug use. It is imperative that this possibility be controlled and understood so that results from hair testing can be appropriately interpreted. Presently, truly unique metabolites are needed for many drugs (THC-COOH being a notable exception) since the mechanisms of decontamination processes used for hair are still poorly understood. While there is evidence that many drugs preferentially bind to melanin and that darker hair contains more drug, it is unclear how this translates into the interpretation of results for a population. Cosmetic treatments likely reduce the amount of drug systemically incorporated into hair and thus present a challenge of inappropriately negative interpretation. In addition, hair damaged as a result of cosmetic treatment may be at increased risk for environmental contamination. The asynchronous nature of human hair growth can also complicate results by obscuring the timeline of drug deposition. Lastly, the analytical variation of quantitative values has been demonstrated by several proficiency testing systems throughout the world to be high and method specific. Thus, while hair testing may be able to provide information about exposure to drugs, it is difficult at present to obtain reproducible results that can be unquestionably related to drug ingestion or to infer that the absence of drug in a hair sample is positive proof of no drug usage. Many questions still remain to be addressed by mechanistic understanding of drug deposition and retention in hair.

KEY WORDS: Cosmetic treatment, external contamination, hair testing, melanin content.
