SDRL Laboratory

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Technical Brief: Methadone and Methadone Metabolite (part 2)

Part 1 of this Technical Brief appeared in the October, 2011 issue of *Toxicology Times*.

Urine drug testing of methadone maintenance patients usually screens for all of the drugs that a patient should not take along with the testing results for the drugs that the patient should take. Simply stated the patient should be negative for all of the drugs not prescribed, and positive for the drugs prescribed. Since methadone is the only drug consumed in most patients, this value should be positive. A positive result indicates that the value of the methadone found in the patient's sample is above the cut-off level. Usually the cut-off level is 300 ng/mL. Normal dosing of 80 to 100 mg/day will put a high level of methadone in the urine. It is expected that patients consuming a dose of 20-30 mg/day will routinely screen positive for both methadone and EDDP at the 300 ng/mL cut-off. Further, methadone (the medication) could be added directly to a urine sample and the laboratory test would result in a positive value, when really the patient had not consumed their dose. To fully monitor a patient using urine values, it is necessary to determine the value of the major metabolite, EDDP, to verify that the patient had actually consumed their dose. If a patient skipped their dose, the value of methadone would be negative and the EDDP positive. The only normal condition where the patient's value for methadone is positive and EDDP (the metabolite) is negative is pregnancy; all other interpretations of a negative for methadone metabolite are non-consumption of the drug.

Monitoring saliva samples is a little different. The saliva drug concentrations will follow blood concentrations and will reflect these same values. Since metabolites are quickly eliminated, they are normally not found in the saliva sample or blood sample. Usually saliva samples are collected with the clinic testing person facing the patient. Therefore, the opportunity to add methadone to the sample is minimized. The patient must rinse their mouth prior to collection and methadone must not have been recently consumed. This is a necessary condition for the proper collection of a saliva sample.

To summarize, one can say that if a non-pregnant person consumes his/her total prescribed dose of methadone on a daily basis and if that dose is greater than 20 mg/day, then the person's drug screen will be positive for methadone and EDDP at urine levels above 300ng/ml. If a dose is skipped for a 24 hour period, the methadone will likely be negative, however the EDDP will be positive at the same urine cut-off values. If a patient attempts to alter the drug screen by the addition of methadone to the urine, the values will be negative for EDDP and positive for methadone.

Urine drug screen values cannot be used to determine that a patient has taken and consumed their total daily dose. Taking half dose of 50 mg/day will produce methadone and EDDP and one can make no further judgment regarding the amount of the dose consumed. Serum methadone values will help resolve the compliance issue, and will be written about in a future communications.

??? Did You Know ???

That an immunoassay verification is not technically considered a confirmation? The most common toxicology test requested is a urine drug screen, which is collection of immunoassay tests. An immunoassay test can screen for a drug class (group) and give a presumptive positive result. There are several types of immunoassay techniques: RIA (radioimmunoassay), EIA (enzyme immunoassay), KIMS (kinetic interaction of microparticles in solution) or CEDIA (cloned enzyme donor immunoassay). There is a common confusion that one technique of immunoassay can confirm a different immunoassay technique. As an example, an RIA should not be considered a confirmation to an EIA. An RIA can be considered a verification test, but not a confirmatory test. A true confirmatory test should be performed by a completely separate method, such as TLC (Thin Layer Chromatography), GC/MS (Gas Chromatography/Mass Spectrometry), or HPLC (High Performance Liquid Chromatography).

Question of the Month

Question: *Can mouthwash be used to cheat on saliva tests?*

Answer: The simple answer is 'No'. When a person uses mouthwash, the mouth and saliva are cleaned of bacteria. Immediately after use, a mixture of saliva and mouthwash remains in the mouth. Soon after, the body resumes regular saliva production and the mouthwash is eliminated through normal salivation and swallowing. The average person produces about 1.5 liters of saliva per day so within a short period of time it is expected that the saliva in the mouth will resume to its pre-mouthwash concentration of drugs that are currently in the body. The patient should not consume any liquids five minutes prior to saliva collection. If you suspect the patient has recently used mouthwash and have reason to believe extra caution is necessary, request the patient rinse their mouth with water; then have the patient wait 5-10 minutes before beginning the saliva collection.