



## Using umbilical cord tissue to detect a neonate's exposure to drugs of abuse

by Charles Plate, Ph.D.  
Laboratory Director

The limitations associated with newborn meconium testing no longer exist in hospitals using the newest form of infant drug testing—CordStat<sup>SM</sup>. USDTL formulated this breakthrough test when a client using meconium testing asked for a more efficient method. Even though MecStat<sup>SM</sup> was USDTL's signature test, the New Applications Department could not ignore a client's request.

In 1991, United States Drug Testing Laboratories (USDTL) introduced MecStat<sup>SM</sup>, a test that uses a newborn's meconium to detect *in utero* exposure to drugs of abuse used by the mother during the last half of her pregnancy. Physiological abnormalities expressed by the newborn due to drug exposure are thereby diagnosed and appropriate treatments can begin.

However, meconium collection can take up to three days, with multiple collections from one baby required to obtain sufficient sample for testing. Multiple samples from multiple babies in a busy hospital nursery can result in chain-of-custody issues. Furthermore, in 8 percent to 20 percent of all pregnancies, the fetus undergoes fetal stress and releases the meconium *in utero*. While the cause of the fetal stress could be due to exposure to drugs of abuse, the meconium sample is lost, and a definitive diagnosis of exposure of the infant to drugs cannot be made. Therefore, the most at-risk infants are not being tested or treated for exposure.

Enter CordStat<sup>SM</sup>. CordStat<sup>SM</sup>, which utilizes 6-inch to 8-inch sections of umbilical cord tissue, was launched as a 5-drug panel test in 2008 and was augmented by additional 7-, 9-, and 12-drug panels in 2009.

CordStat<sup>SM</sup> offers several advantages over MecStat<sup>SM</sup>. There is an abundant amount of umbilical cord tissue available for testing, and the umbilical cord is available right after the infant's birth. Thus, turnaround time from sample submission to receipt of laboratory results is reduced to one day to three days with CordStat<sup>SM</sup>. This shorter turnaround allows for a shorter



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hospital stay for both the mother and the infant. Umbilical cord tissue is available from all newborns, including those that have undergone fetal stress syndrome. These infants can now be tested to determine if their fetal stress was the consequence of the mother using drugs of abuse during the pregnancy. Lastly, CordStat<sup>SM</sup> requires only one sample collection, eliminating chain-of-custody issues that arise from multiple sample collections of meconium.

USDTL realizes that hospitals currently using meconium testing will have to change procedures to accommodate umbilical cord testing. However, the procedural changes can be made easily with the help of USDTL-prepared informational material, which highlights the differences between meconium testing and umbilical cord testing and how to get the switchover started in a hospital.

CordStat<sup>SM</sup> offerings grow consistently. USDTL recently released an add-on assay to CordStat<sup>SM</sup> testing for buprenorphine, a drug becoming popular for treating opiate withdrawals in pregnant women.

## Breast milk testing monitors nursing mothers

by Robert Demaree  
Clinical Projects Manager

Most drugs of abuse appear in breast milk when nursing mothers are using drugs and provide some level of risk to the infant. Drugs that are fat-soluble, like cocaine, marijuana and amphetamines, are concentrated in breast milk and may produce negative effects in the newborn.

The American Academy of Pediatrics Committee on Drugs stated that "nursing mothers

should not ingest drugs of abuse because they are hazardous to the nursing infant and the health of the mother." After recent client inquiries, USDTL introduced test panels to monitor a variety of drugs of abuse in breast milk samples.

### Breast milk drug panels

5-drug: amphetamines, cannabinoids, cocaine, opiates, phencyclidine (PCP)

7-drug: 5-drug plus methadone and barbiturates

9-drug: 7-drug plus benzodiazepines and propoxyphene

12-drug: 9-drug plus meperidine, tramadol and oxycodone

## References

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## Diverted buprenorphine causes withdrawal in newborns

by Robert Demaree  
Clinical Projects Manager

Unexplained incidence of neonatal abstinence syndrome (NAS) could be caused by pregnant women using diverted buprenorphine to avoid withdrawal symptoms. The absence of buprenorphine on a standard maternal or newborn test leaves neonatal nurses without the expectation of a newborn withdrawal period.

Buprenorphine is a synthetic opioid used to treat narcotic addiction and to manage pain. Buprenorphine is a component in two new addiction treatment drugs, Suboxone<sup>®</sup> and Subutex<sup>®</sup>. Both formulations are available as sublingual tablets containing either 2 milligrams or 8 milligrams of buprenorphine. Suboxone<sup>®</sup>, the most commonly used form, is a combination of buprenorphine and naloxone.

Buprenorphine is identified as an opioid partial agonist. Partial agonists bind receptors at lower doses than full agonists, like heroin or methadone. Partial agonists demonstrate a ceiling effect where increasing the dose of the drug does not increase the effect of the drug past a certain point. This factor limits the abuse of the drug. Naloxone, an opioid antagonist, was included in the Suboxone<sup>®</sup> formulation in order to reduce abuse of the drug by inhalation or injection. Subutex<sup>®</sup> contains buprenorphine alone. The FDA approved both drugs as alternative treatment for opiate addiction.

Methadone is the drug primarily used to treat opiate addiction. The methadone treatment protocol requires program members to make daily visits to a licensed treatment clinic to receive their medication. To make treatment more available, the FDA approved Suboxone<sup>®</sup> and Subutex<sup>®</sup> for opiate treatment by prescription from a specially-trained physicians.

Abuse of buprenorphine has become a growing problem in recent years. The addition of naloxone to the Suboxone<sup>®</sup> formulation was intended to limit abuse by crushing the tablet and injecting or snorting the drug. A 2004 Department of Justice bulletin indicated that snorting the tablet had become a common means of ingestion for those addicted to a low dose of opiates. Combining methadone and Suboxone<sup>®</sup> may enhance the euphoric effects.

In 2008, USDTL received concerns from hospitals about pregnant women using diverted buprenorphine to avoid withdrawal. Since standard opiate drug test panels did not monitor buprenorphine, an incidence of unexplained NAS occurred.

Buprenorphine may in fact have value as a treatment for NAS. In a recent Pediatrics article, Kraft et al. reported that sublingual buprenorphine provided to a population of opiate-exposed term infants appeared to be a safe treatment for NAS.

In 2009, USDTL introduced buprenorphine as an add-on assay to any MecStat<sup>SM</sup> or CordStat<sup>SM</sup> drug test panel.

