

Advances in Newborn Toxicology Testing

The most comprehensive umbilical cord panel



When you need to know.™

Why Umbilical Cord Testing?

Maternal drug use has increased over the last decade with a baby born every 15 minutes with neonatal abstinence syndrome (NAS).¹ **Umbilical cord testing (UCT)** provides a controlled method for diagnosing and can be collected on all newborns at the time of birth.



Why perform newborn toxicology testing?¹

- ▲ Identify which substance the baby has been exposed to *in utero*
- ▲ Helps determine safe and appropriate treatment course and care for the baby
- ▲ To identify intervention needs for the mother

The impact of NAS to the healthcare system

- ▲ From 2004-2013 the rate of NICU admissions for NAS increased from 7 cases to 27 cases per 1000 admissions²
- ▲ Average hospital stay for an infant with NAS is **3.5 times longer**²
- ▲ NAS represents **\$1.5 billion in additional hospital costs**³





NMS Labs

Umbilical Cord Drug Test Panels

CLASS	9145UC	9352UC	9351UC	9146UC
ALCOHOL BIOMARKER				
ETHYL GLUCURONIDE				X
AMPHETAMINES				
AMPHETAMINE	X	X	X	
METHAMPHETAMINE	X	X	X	
MDA	X	X	X	
MDEA	X	X	X	
MDMA	X	X	X	
CANNABINOIDS				
DELTA-9 CARBOXY THC	X	X	X	
DELTA-9 THC	X			
STIMULANTS				
BENZOYLECGONINE	X	X	X	
COCAETHYLENE	X			
COCAINE	X			
OPIATES				
6-MONOACETYLMORPHINE-FREE	X	X	X	
CODEINE-FREE	X	X	X	
HYDROCODONE-FREE	X	X	X	
HYDROMORPHONE-FREE	X	X	X	
MORPHINE-FREE	X	X	X	
NORHYDROCODONE	X			
NOROXYCODONE	X			
PCP				
PHENCYCLIDINE	X	X	X	
METHADONE				
METHADONE	X	X		
EDDP	X	X		
BARBITURATES				
BUTALBITAL	X	X		
PHENOBARBITAL	X	X		
BENZODIAZEPINES				
ALPRAZOLAM	X	X		
DIAZEPAM	X	X		
MIDAZOLAM	X	X		
CHLORDIAZEPOXIDE	X			
CLONAZEPAM	X	X		
7-AMINO CLONAZEPAM	X	X		
FLUNITRAZEPAM	X			
FLURAZEPAM	X			
DESALKYLFLURAZEPAM	X			
LORAZEPAM	X			
NORDIAZEPAM	X	X		
OXAZEPAM	X	X		
TEMAZEPAM	X	X		
TRIAZOLAM	X			

CLASS	9145UC	9352UC	9351UC	9146UC
HYDROXYTRIAZOLAM	X			
OXYCODONE				
OXYCODONE-FREE	X	X		
OXYMORPHONE-FREE	X	X		
FENTANYL				
ACETYL FENTANYL	X			
FENTANYL	X	X	X	
NORFENTANYL	X	X	X	
DIHYDROCODEINE/ HYDROCODOL-FREE	X			
BUPRENORPHINE				
BUPRENORPHINE-FREE	X			
NORBUPRENORPHINE-FREE	X			
ANALGESICS				
MEPERIDINE	X			
NORMEPRIDINE	X	X		
TRAMADOL	X	X		
O-DESMETHYLTRAMADOL	X	X		
TAPENTADOL	X			
MUSCLE RELAXANTS				
CARISOPRODOL	X			
MEPROBAMATE	X			
DEPRESSANTS				
ZOLPIDEM	X			
DEXTRO/LEVO METHORPHAN	X	X		
CATHINONE				
ALPHA-PVP	X			
METHYLONE	X			
ETHYLONE	X			
SUMMARY				
ANALYTES	57	31	13	1
CLASSES	16	12	5	1

9145UC

Comprehensive Drug Screen, UC Tissue

9352UC

Expanded Drug Screen, UC Tissue

9351UC

Basic Drug Screen, UC Tissue

9146UC

Ethyl Glucuronide Screen, UC Tissue

What Do Neonatologists Say?

Accuracy is so important.

Newborn drug testing is instrumental in providing accurate care for newborns with NAS. Research among **neonatologists and pediatricians** identified these top attributes as significant.⁴



Turnaround time

- ▲ 24-hour turnaround for negative result and 72 hours for positive result



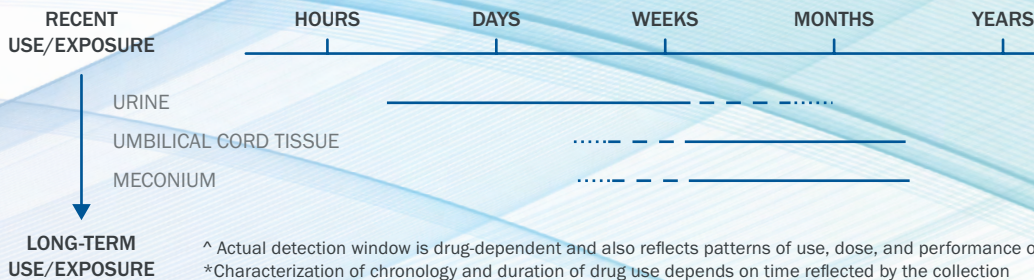
Scope of drugs tested

- ▲ UCT provides the most comprehensive drug coverage with **57 drugs and 16 drug classes**



Window of drug detection during gestation

- ▲ Longer window of detection for identification of drug use as compared to urine, and a detection window similar to meconium⁵



Comprehensive test report and interpretation

- ▲ UCT sample is uniform and provides accurate and informative test result
- ▲ Expert toxicologist is on hand to answer your questions at 1-866-522-2206 or email Clinical@nmslabs.com



Availability and ease of a sample collection

- ▲ Testing umbilical cord tissue is as easy as 1-2-3:
 1. Collect at the time of delivery
 2. Follow simple instructions for sample prep – rinse, pat dry, and send in specimen container
 3. Ship to NMS for fast turnaround time and test results

Umbilical Cord is as easy as 1-2-3: Collect, Prepare and Ship

1. COLLECT

- ▲ Collect at least 6 inches of umbilical cord (approximately the length of an adult hand)
- ▲ Drain and discard any blood
- ▲ Rinse the exterior of the cord segment with normal saline or sterile water
- ▲ Pat the cord dry

2. PREPARE

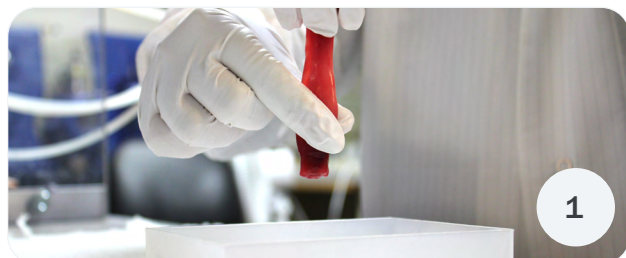
- ▲ Place specimen in the container provided in NMS Labs' Umbilical Cord Sample Collection kit (order through Client Services at 1-866-522-2206)
- ▲ Secure the lid
- ▲ Apply supplied tamper seal and affix patient label

3. SHIP

- ▲ Place container in specimen bag
- ▲ Complete the "Analysis Requisition And Chain Of Custody" contained in the kit or download from NMS Labs' website.
https://www.nmslabs.com/sites/default/files/2020-03/Umbilical_Cord_Requisition_Form_2020.pdf
- ▲ Mark or affix label ("Umbilical Cord") on external shipping container
- ▲ Send to NMS Labs
- ▲ Ship with a cold pack

Unacceptable Specimens

- ▲ Cords soaking in blood or other fluid
- ▲ Formalin-fixed tissue
- ▲ Decomposed tissue
- ▲ Specimens received without a cold pack



Newborn Toxicology Sample Types

	URINE	MECONIUM	NMS LABS UMBILICAL CORD
EASE OF COLLECTION	Difficult	Moderate	Easy
WINDOW OF DETECTION	Days	(2nd &) 3rd Trimester	(2nd &) 3rd Trimester
SPECIMEN AVAILABILITY	Universal	80-90% of time	Universal
SPECIMEN SIZE	Variable (milliliters)	Variable (Grams)	6 inches
COMPOSITION	Homogeneous	Heterogeneous	Homogeneous
STABILITY	More Stable	Noted problems with some drugs	More Stable
TESTING TURNAROUND TIME	Hours (if performed in same hospital as birth)	1-6 Days	1-3 Days



Trusted mass spectrometry process

- Greater resolution to identify, quantify and distinguish drugs of abuse
- Superior sensitivity to immunoassay
- Reliable results with trusted accuracy



Strict chain-of-custody protocol

- Clinical laboratory rooted in forensic principles ensuring sample integrity
- Reporting and COC can be used in legal proceedings



Largest panel on the market

- Comprehensive Drug Panel covering 57 drugs and metabolites and up to 16 drug classes
- Additional panels to meet your needs



Quick turnaround times

- 24 hours - initial negative screen
- 48 hours - positive confirmation report
- 72 total hours - turnaround time



Consultation & Interpretation

- Expert toxicologists on hand to answer your questions
- Detailed reporting highlighting detected substances



Enhanced Efficiencies

- NMS Labs works with all national laboratories
- No additional process required
- Send samples through send out provider using their interface

References

1. Jilani, MMWR, 2019
2. Tolia VN, Patrick SW, Bennett MM, Murthy K, Sousa J, Smith PB, Clark RH, Spitzer AR Increasing Incidence of the Neonatal Abstinence Syndrome in U.S. Neonatal ICUs. *N Engl J Med* 2015; 372:2118-2126.
3. Patrick, S., Davis, M., Lehmann, C. et al. Increasing incidence and geographic distribution of neonatal abstinence syndrome: United States 2009 to 2012. *J Perinatal* 35, 650–655 (2015). <https://doi.org/10.1038/jp.2015.36>
4. Data on File, NMS Labs, 2020.
5. Wabuye SL, Colby JM, McMillin GA. Detection of drug-exposed newborns. *Ther Drug Monit.* 2018;40(2):166-185. doi: 10.1097/FTD.0000000000000485