Newborn Critical Care Center (NCCC) Clinical Guidelines

Guidelines for Newborn Drug Screening

BACKGROUND

Use of drugs during pregnancy can result in a myriad of neonatal effects including: a transient withdrawal syndrome, an acute toxicity, or sustained signs with lasting drug effect. Additionally, the intrauterine exposure might potentiate the effects of later treatments or cause subsequent withdrawal symptoms.[2] Up to 94% of neonates exposed to opioids in-utero will exhibit withdrawal symptoms.[2]

Overall, it is estimated that 20% of pregnant women use illicit drugs during pregnancy.[3] Currently, 19 states and the District of Columbia have regulations for reporting infants exposed to drugs.[3] At UNC, all positive urine/meconium drug screening results (that are not otherwise explained by prescribed maternal medications) are forwarded to the Department of Social Services (DSS) of the county where the mother resides, and DSS has full authority and jurisdiction to pursue further action.

The decision to screen urine or meconium for the presence of opiates or other illicit drugs should be based on an assessment of risk factors for intrauterine drug exposure. There are currently no federal guidelines defining criteria for testing. Because such testing is for diagnostic purposes, a separate consent is not required.

WHY TEST?

- Infants with in utero drug exposure are at increased risk for neurodevelopmental problems[4]
- Potential for child neglect after discharge[5]
- Child Protective Services referral

HOW DO WE TEST?

- Urine and meconium are most commonly used for neonatal drug screening

Urine Specimen

- Noninvasive; Generally provides the fastest results, usually within hours
- Narrow window of detection from maternal ingestion to excretion in infant's urine
    - Results are most useful for exposures occurring in preceding 3-5 days
    - Sample needs to be obtained proximate to birth
- Minimum 10 mL required
- Initial broad screening tests classes of drugs e.g. opioids, benzodiazepines, amphetamines, barbiturates, cannabinoids, cocaine, and phencyclidine
    - A positive qualitative screening test is followed by a confirmatory test using same specimen

Meconium Specimen

- Noninvasive; specimen collection may be difficult in newborns who pass meconium in utero prior to delivery, and in very small or critically ill neonates
- Longer window of detection
    - Reflects exposures occurring approximately 20 weeks prior to birth
- Minimum 1 gm (approx. 1 tsp) meconium required
    - Send-out to Mayo Medical laboratories with a 5-10 business days turnaround time

If screen is **POSITIVE** for any individual drug,
confirmatory testing will be performed which may take up to 4 additional days.

SCREEN IF THE FOLLOWING RISK FACTORS ARE PRESENT:[2]

Maternal History

- Mothers prescribed opiates during their pregnancy
- History of drug abuse within the last 12-18 months
- Prenatal care starting after 16 weeks or less than a total of four prenatal visits
- History of child abuse, neglect, or court-ordered placement of other children outside the home
- History of domestic violence
- History of hepatitis, human immunodeficiency virus, syphilis, or prostitution
- Unexplained placental abruption
- Acute maternal alcohol intoxication observed around the time of delivery

Infant History

- Unexplained intrauterine growth restriction
- Infants with evidence of drug withdrawal such as hypertonia, irritability, or tremulousness (see Table 1)

New and noteworthy…*but not performed at UNC*…

Umbilical Cord Tissue Segment Testing

- Advantages include ability to collect in a single encounter immediately after birth
- Window of detection believed to encompass the third trimester
- Limitations include uncertainty about the timing and mechanisms of drug deposition
- Cord tissue may reveal more recent exposures than meconium including exposures that happen just prior to or even during delivery
- Cord tissue is easy to collect and can be sent to lab for analysis immediately after a birth which may be preferable for nurses and clinicians
- Although offers many advantages, yield of testing is lower and it may be difficult to draw solid conclusions regarding timing or duration of exposure

References:

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4. Hudak ML, Tan RC; COMMITTEE ON DRUGS; COMMITTEE ON FETUS AND NEWBORN; American Academy of Pediatrics. Neonatal drug withdrawal. *Pediatrics.* 2012 Feb;129(2):e540-60. doi: 10.1542/peds.2011-3212. Epub 2012 Jan 30. PubMed PMID: 22291123
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Reviewed November 2019 – Lee / Aliaga

Table 1: Maternal Nonnarcotic Drugs That Cause Neonatal Withdrawal[1]

Drug	Signs	Onset of Signs	Duration of Signs
Alcohol**	Hyperactivity, crying, irritability, poor suck, tremors, seizures, poor sleeping pattern, hyperphagia, diaphoresis	3 – 12 hours	18 months
Barbiturates	Irritability, severe tremors, hyperacusis, excessive crying, vasomotor instability, diarrhea, restlessness, increased tone, hyperphagia, vomiting, disturbed sleep	1 – 14 days	4 – 6 months with prescription*
Caffeine	Jitteriness, vomiting, bradycardia, tachypnea	At birth	1 – 7 days
Chlordiazepoxide *(Librium)*	Irritability, tremors	Days - weeks	9 months (1.5 months with prescription)
Clomipramine *(Tricyclic antidepressant)*	Hypothermia, cyanosis, tremors	12 hours	4 days with prescription
Diazepam *(Benzodiazepine)*	Hypotonia, poor suck, hypothermia, apnea, hypertonia, hyperreflexia, tremors, vomiting, hyperactivity, tachypnea	Hours - weeks	8 months, 10 – 66 days with prescription
Ethchlorvyol *(Sedative hypnotic)*	Lethargy, jitteriness, hyperphagia, irritability, poor suck, hypotonia		10 days with prescription
Glutethimide *(Sedative hypnotic)*	Increased tone, tremors, opisthotonos, high-pitched cry, hyperactivity, irritability, colic		6 months
Hydroxyzine *(Antihistamine)*	Tremors, irritability, hyperactivity, jitteriness, shrill cry, myoclonic jerks, hypotonia, increased respiratory and heart rates, feeding problems, clonic movements		5 weeks with prescription
Meprobamate *(Anxiolytic)*	Irritability, tremors, poor sleep patterns, abdominal pain		9 months, 3 months with prescription
SSRIs	Crying, irritability, tremors, poor suck, feeding difficulty, hypertonia, tachypnea, sleep disturbance, hypoglycemia, seizures	Hours - days	1 – 4 weeks

* ***WITH PRESCRIPTION*** indicates the infant was treated with pharmacologic agents and the natural course of the signs may have been shortened

** ***SPECIAL NOTE ABOUT ALCOHOL:*** Alcohol is cleared quickly and will not show up in a urine or meconium screen (though assays are being developed). ***If a mother is inebriated at the time of delivery a blood alcohol level can be obtained on the mother or infant.*** Acute alcohol intoxication can cause respiratory depression, hypoglycemia or seizures in the newborn. Alcohol withdrawal can cause seizures and cardiovascular collapse.