You Don’t See What You Are Not Looking For: Drug Testing in CAP Programs

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You Do Not See What You Are Not Looking For

The "Grey Area" and Substance Abuse

- **Problem #1**
  - Unidentified substances ingested by children leads to unsubstantiations by Child Protective Services.

- **Problem #2**
  - Drug use by a caregiver is only a protection issue if it affects safety, responsiveness, or decision making.

  "…It's one thing to use it while the kid is at school but is another to smoke it and the child be exposed to it. My main thing is we want to ensure that the mother wasn't smoking methamphetamine around the child"…. ---Local Child Protective SW

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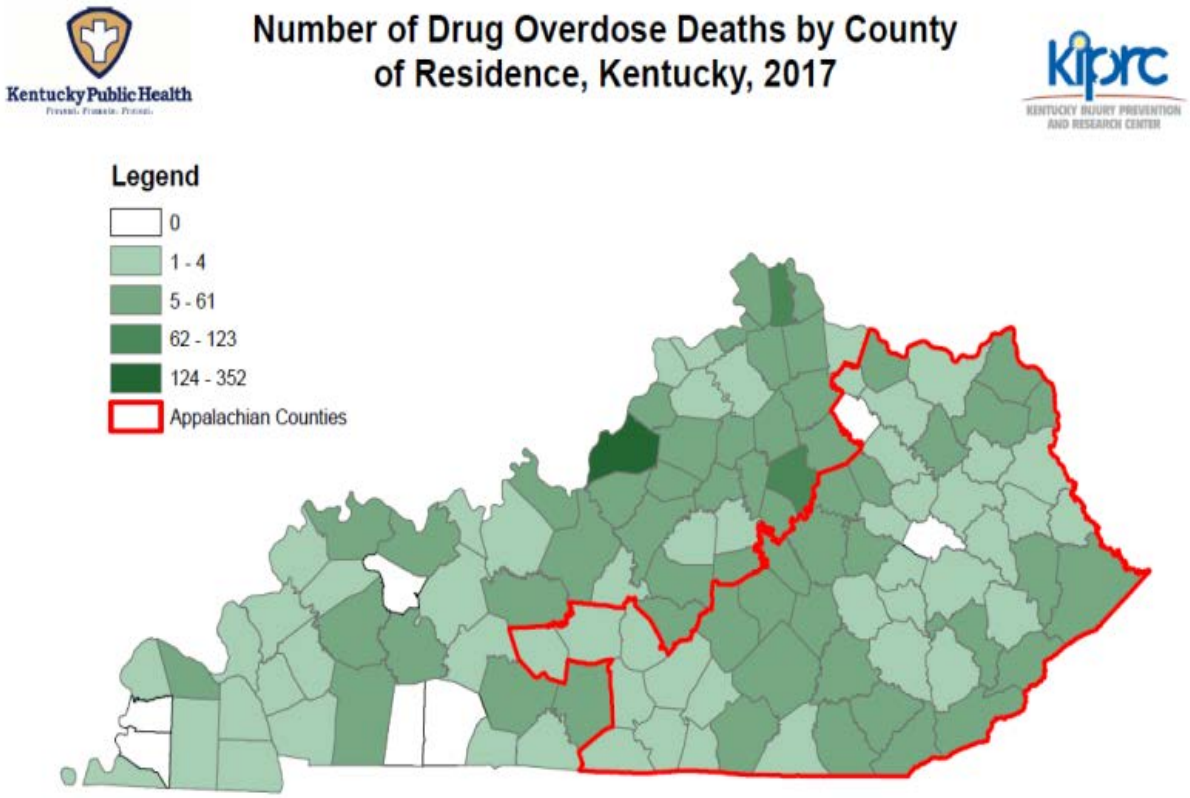

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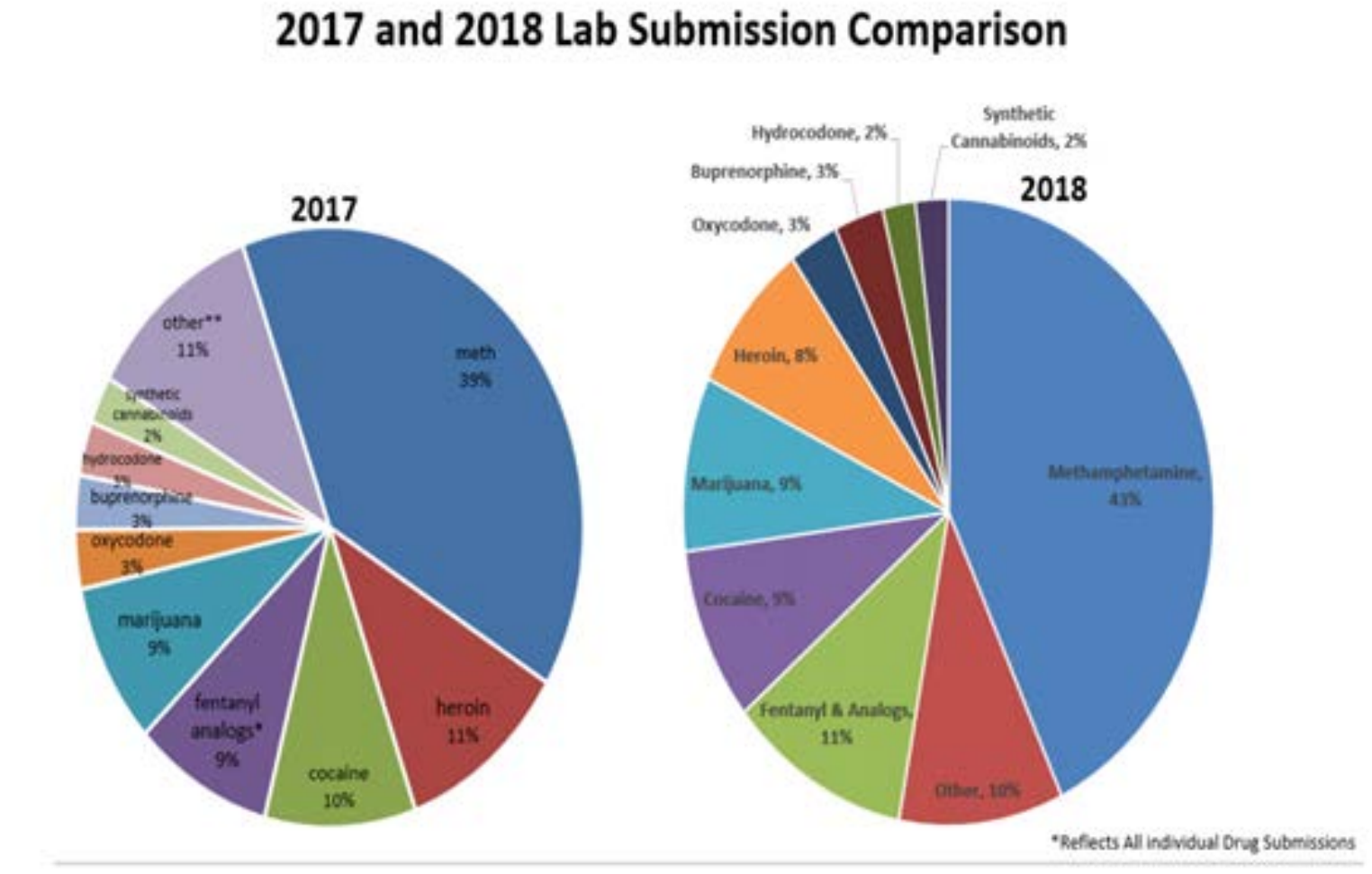
Drug Epidemic Data



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Case 1: Why do we do it? The Perfect Storm

- 2 year old male ingested a family members clonidine when he was visiting the home. No one reported the medication missing. The child went to visit another family member who noticed him to be lethargic and difficult to arouse. He was taken to the hospital several hours after the initial ingestion. On arrival to the hospital he was intubated and transferred to a larger facility.
- No law enforcement investigation, as we were unsure of the "scene".

Date (Collected/Resulted)	Urine Drug Screening	Confirmation Urine Drug Screen	Hair Toxicology
	Negative	_____	____
	____	Never completed	____

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Case 2: " I left him so I didn't use with him"

- NCH PPT consulted regarding for concern for sexual abuse after mother came home to find nearly 3 year old had had multiple episodes of diarrhea which was unusual.
- Additional information included that mother left the child with her sister and boyfriend who were known drug uses so she (mother) could leave the home to use drugs. Mother and child also with recent history of homelessness and had been "staying" with the aunt.

Date (Collected/Resulted)	Urine Drug Screening	Confirmation Urine Drug Screen	Hair Toxicology
11/10/2018 11/10/2018	Negative	_____	____
11/10/2018 11/12/2018	____	Cocaine 64.4 ng/mL	____

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Case 3: Late Night "Walk"

- NCH PPT was consulted after 3 year old child left the home in the early morning hours and went to local grocery store. Grocery staff contacted law enforcement who transported to emergency department. Child in care of grandfather at the time of incident.
- NCH PPT assessment identified a single TEN-4 region bruise. Risk factors identified, child has a twin and younger sibling.

Date (Collected/Resulted)	Urine Drug Screening	Confirmation Urine Drug Screen	Hair Toxicology
10/29/18 10/29/18	Negative	Methamphetamine 48 ng/mL; benzogylecgonine 12ng/mL	_____
11/1/18 11/6/18	_____	_____	Methamphetamine 2,107pg/mL Native THC >2000pg/mL Carboxy THC 0.19 pg/mL

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Case 3: Late Night Walk (Continued)

- Sibling age 3:

Date (Collected/Resulted)	Urine Drug Screening	Confirmation Urine Drug Screen	Hair Toxicology
11/1/18 11/6/18	____	____	Methamphetamine 1899 pg/mg Carboxy THC 0314 pg/ng Native THC 1565 pg/mg

- Sibling age 1:

Date (Collected/Resulted)	Urine Drug Screening	Confirmation Urine Drug Screen	Hair Toxicology
11/1/18 11/6/18	_____	_____	Amphetamine 371 pg/mg Methamphetamine 6251 pg/mg Cocaine 647 pg/mg Benzoylecgonie 292 pg/mg Carboxy THC 0.35 pg/mg Native THC >2000 pg/mg

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Case #4 Picked up something in the car

- 9 month old was placed in his car seat in his father's vehicle to return to his mother. By the time they pulled into mother's drive, father noticed when he got the child out of his seat that he was drooling, not focusing, and breathing "funny." The child was taken to an EMS station where he was transported to the local hospital.
- He required intubation, IV fluid bolus, and needed constant stimulation. Finally he received Narcan.

Date (Collected/Resulted)	Urine Drug Screening	Confirmation Urine Drug Screen	Hair Toxicology
_____	Positive-Opiates	Morphine >500ng/ml Codeine 106ng/ml Naloxone 665 ng/ml Fentanyl >50ng/ml Norfentanyl >250ng/ml	Not Obtained

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Response to Narcan

- Narcan:
  - Route
  - Dose
  - RESPONSE
- In a typical immunoassay drug screen, the opiates class does not include synthetic opiates such as:
  - Methadone
  - Buprenorphine
  - Fentanyl
  - Tramadol
  - If it walks like a duck and sounds like a duck and swims like a duck, it's probably a duck

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Case #5: He woke up that way

- 11 month old child was admitted to PICU for unresponsiveness, cyanosis, and decreased response to painful stimuli.
- Family reported child woke from a nap at 8:00pm with altered mental status and "They new something was wrong". Caregivers reported child's "lips turned blue" and they "panicked".
- The biological parents have a long history of drug abuse and had previously been in medication assisted therapy programs, they were not supposed to be having unsupervised access to the child. Ultimately, mother reported 4-5 of her Suboxone medication was "missing".
- Child had "minimal" response to narcan.

Date (Collected/Resulted)	Urine Drug Screening	Confirmation Urine Drug Screen	Hair Toxicology
6/25/2018	Negative	Buprenorphine 11.3 ng/ml Norbuprenorphine 94.5 ng/ml Naloxone 1590 ng/ml	_____

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Ten-4
Bruising Rule

Be aware of any bruising to the:

Torso
Ears
Neck

or bruising **anywhere** on a child

4 months old or younger.

These bruises are **significant** indicators of abuse.

Bruising on babies is not normal!

Pierce MC, Kaczor K, Aldridge S, O'Flynn J, Lorenz DJ. Bruising characteristics discriminating physical child abuse from accidental trauma. *Pediatrics*. 2010;125(1):67-74. Epub Dec. 7, 2009. Erratum in *Pediatrics*. 2010;125(4):861.

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Be aware of bruising

- Bruising is the most overlooked sign of abuse.
- Bruising is very rare in infants younger than 6 months old and not common in infants who do not roll, crawl or walk.
- A bruise on an infant could mean the child has been abused and needs to be checked by a doctor right away. By law, you also must contact Child Protective Services right away.

In Kentucky: **(877) KYSAFE1 (597-2231)**
In Indiana: **(800) 800-5556**
You may remain anonymous.

Sugar NF, Taylor JA, Feldman KW et al. Bruises in infants and toddlers: those who don't cruise rarely bruise. *Arch Pediatr Adolesc Med*. 1999;153(4):399-403.

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A Review of TEN-4 and FACES

TEN-4

- Bruising anywhere on any non-mobile infant (4-months and younger)
- Bruising on the torso, ears, or neck of any child 4 years or younger

FACES

- Frenulum, angle of the jaw, cheek, Eyelid, subconjunctival hemorrhages

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Case 4: The Custody Battle

- PFM was consulted for concern of medical neglect and general neglect. 2 year old had been with mother and father for extended period of time. Child had large scabbed lesions and scarring to various body surfaced.
- MGM reported the child had spent most of his life in her care however had been fighting for custody of 18mos. MGM reported he appeared to have lost weight. MGM reports mother with a “30 year drug history”

Date (Collected/Resulted)	Urine Drug Screening	Confirmation Urine Drug Screen	Hair Toxicology
10/3/18 10/3/18	Negative	____	_____
10/3/18 10/6/18	____	____	Methamphetamine 1945 pg/mg Morphine >1000 pg/ng Codeine 114 pg/mg 6-MAM >1000 pg/mg (15,330 pg/mg)

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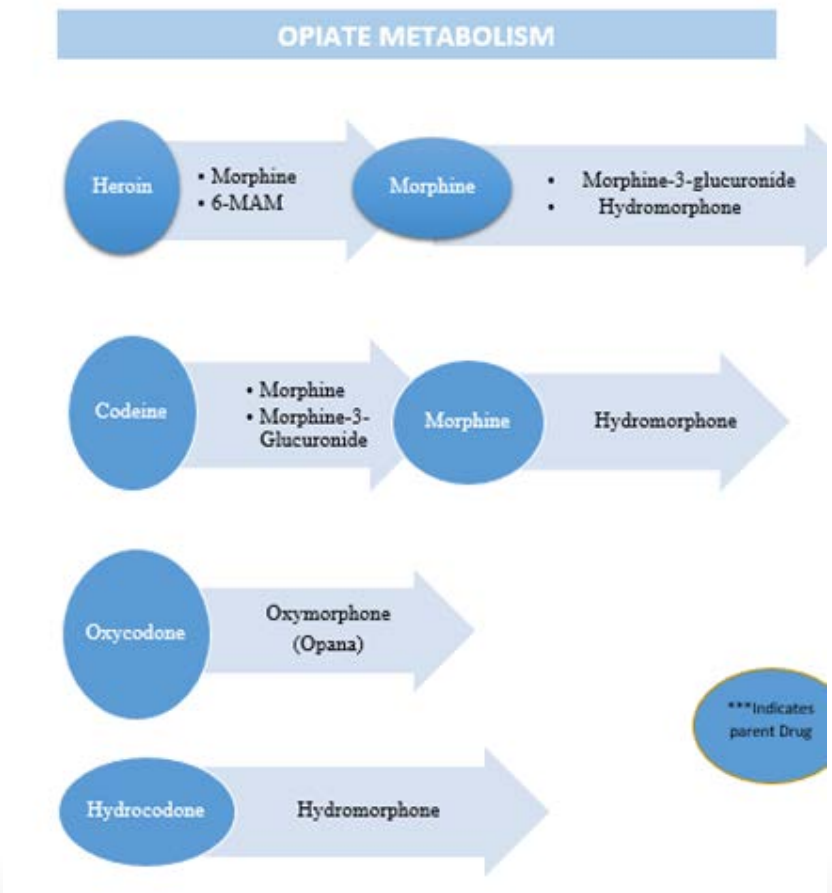
Clinical Implications

- Understanding Limited testing windows and Opiate Metabolism

SUBSTANCE	BLOOD	SALIVA	URINE	HAIR
Alcohol	12 hrs	4-12 hrs	6-24 hrs (5 days with EtG)	n/a
Amphetamine	12 hrs	3 days	1-4 days	up to 90 days
Barbiturates	unknown	unknown	2-10 days	up to 90 days
Benzodiazepines	unknown	6-48 hrs	1-42 days	up to 90 days
Cannabis (single use)	2-3 days	12-24 hrs	2-3 days	up to 90 days
Cannabis (habitual use)	2 weeks	12-24 hrs	15-30 days	up to 90 days
Cocaine	unknown	1 day	1-3 days	up to 90 days
Opioids	unknown	1-36 hrs	2-4 days	up to 90 days
Heroin	unknown	1-36 hrs	2-4 days	up to 90 days
Methamphetamine	1-3 days	1-48 hrs	3-5 days	up to 90 days
PCP	1-3 days	3 days	3-7 days	up to 90 days
Buprenorphine	unknown	6-12 hrs	1-6 days	unknown
Methadone	unknown	6-12 hrs	6-12 days	unknown



- What do I order when:
  - Urine drug screen; urine confirmation, ChildGuard® hair toxicology
- NCH PPT Process:
  - Gather history and pertinent information

- **CAREFUL WITH INTERPRETATION**

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What is in the literature

- Drug Exposure in Child Maltreatment Evaluations: Testing Matters
  - **Oral, R., Bayman, L., Assad, A., Wibbenmeyer, L., Buhrow, J., Austin, A., & Bayman, E. (2011). Illicit drug exposure in patients evaluated for alleged child abuse and neglect. Pediatric Emergency Care, 27(6).**
    - From 2004-2008, 665 charts met inclusion criteria. Of those 232 were tested for illicit drug use. 34 children tested positive for illicit drugs. Logistic regression noted positive correlated more with PA than SA or neglect. Nearly 15% of children tested yielded positive screens.
  - **Pitchini et al (2014) Pediatric exposure to drugs of abuse by hair testing: Monitoring 15 years of evolution in Spain. International Journal of Envrionmental Research and Public Health 11, pp. 8276-8275**
    - Across a 15 year period 3 Cohorts were studies, N=187, N=90, N=114. Analysis showed that 25% of children who were not suspected of child maltreatment/drug exposure had the positive presence of a drug or metabolite in their hair.
- Hair toxicology
  - **Wang, X., & Drummer, O. (2015). Review; Interpretation of drug presence in the hair of children. Forensic Science International, 257, 458-472.**
    - 52 peer-reviewed papers were separated into 3 categories; in-utero exposure; exposure via breastmilk, passive exposures. Hair grows at approximately 1cm/month after 1 year of life on average. Detection of drugs via hair sample in infants is difficult given possibility of intra-uterine exposure. Hair is sufficient to detect passive exposure but should not be used to determine acute exposure. Guidelines should be improved to increase the quality and consistency of interpretation.
  - **Howell, S; Bailey, L; Coffman, J. (2019) Evaluation of drug-endangered children: The yield of toxicology and skeletal survey screening. Child Abuse and Neglect (96)**
    - Retrospective chart review over 6 years, 1252 cases included. Over 52% (N=595) hair toxicology positive for at least one illicit substance**.**

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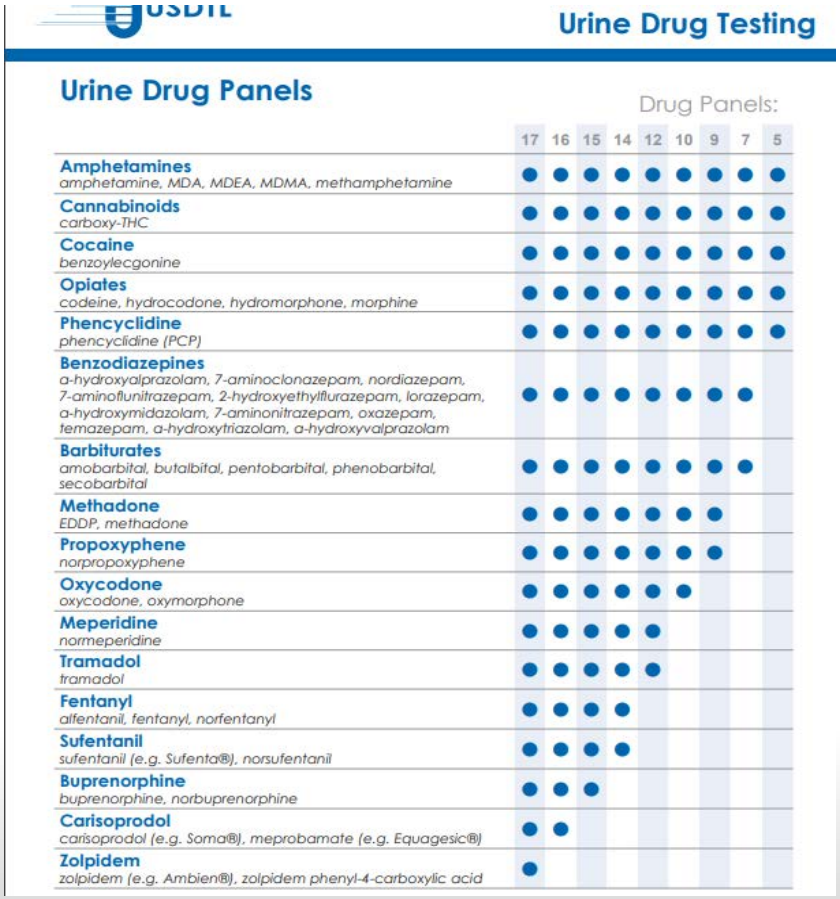
Resources: USDTL Orderable Panels

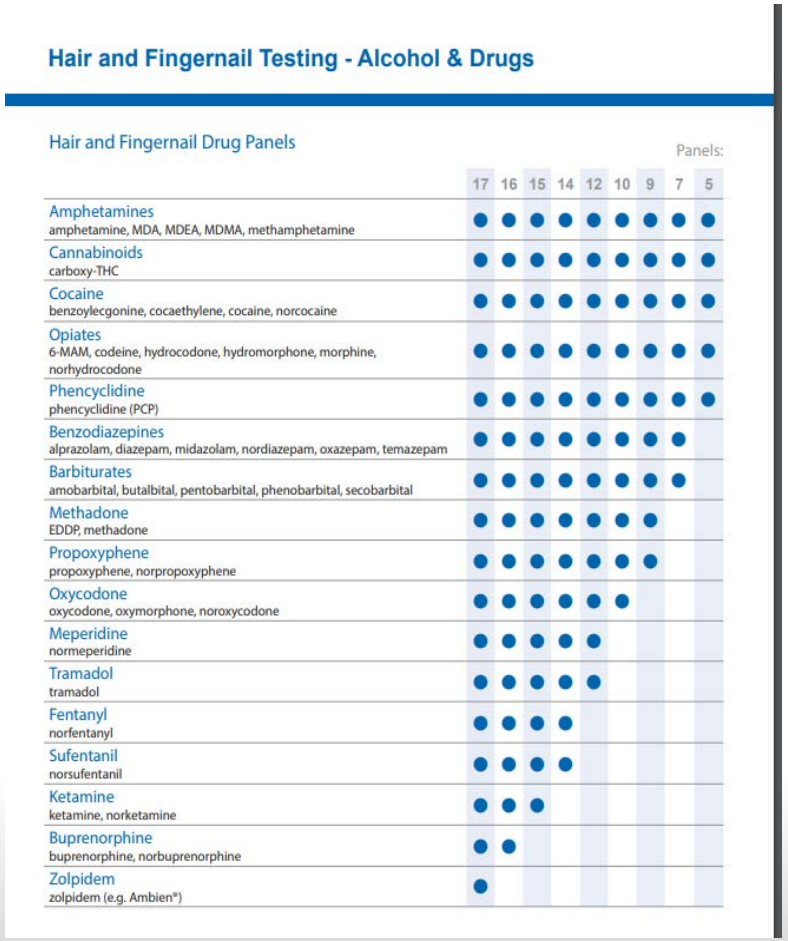


USDTL

Urine Drug Testing

Urine Drug Panels

	Drug Panels: 17	16	15	14	12	10	9	7	5
Amphetamines *amphetamine, MDA, MDEA, MDMA, methamphetamine*	●	●	●	●	●	●	●	●	●
Cannabinoids *carboxy-THC*	●	●	●	●	●	●	●	●	●
Cocaine *benzoylecgonine*	●	●	●	●	●	●	●	●	●
Opiates *codeine, hydrocodone, hydromorphone, morphine*	●	●	●	●	●	●	●	●	●
Phencyclidine *phencyclidine (PCP)*	●	●	●	●	●	●	●	●	●
Benzodiazepines *a-hydroxyalprazolam, 7-aminoclonazepam, nordiazepam, 7-aminoflunitrazepam, 2-hydroxyethylflurazepam, lorazepam, a-hydroxymidazolam, 7-aminonitrazepam, oxazepam, temazepam, a-hydroxytriazolam, a-hydroxyvalprazolam*	●	●	●	●	●	●	●	●	
Barbiturates *amobarbital, butalbital, pentobarbital, phenobarbital, secobarbital*	●	●	●	●	●	●	●	●	
Methadone *EDDP, methadone*	●	●	●	●	●	●	●		
Propoxyphene *norpropoxyphene*	●	●	●	●	●	●	●		
Oxycodone *oxycodone, oxymorphone*	●	●	●	●	●	●			
Meperidine *normeperidine*	●	●	●	●	●				
Tramadol *tramadol*	●	●	●	●	●				
Fentanyl *alfentanil, fentanyl, norfentanyl*	●	●	●	●					
Sufentanil *sufentanil (e.g. Sufenta®), norsufentanil*	●	●	●	●					
Buprenorphine *buprenorphine, norbuprenorphine*	●	●	●						
Carisoprodol *carisoprodol (e.g. Soma®), meprobamate (e.g. Equagesic®)*	●	●							
Zolpidem *zolpidem (e.g. Ambien®), zolpidem phenyl-4-carboxylic acid*	●								



Hair and Fingernail Testing - Alcohol & Drugs

Hair and Fingernail Drug Panels

	Panels: 17	16	15	14	12	10	9	7	5
Amphetamines amphetamine, MDA, MDEA, MDMA, methamphetamine	●	●	●	●	●	●	●	●	●
Cannabinoids carboxy-THC	●	●	●	●	●	●	●	●	●
Cocaine benzoylecgonine, cocaethylene, cocaine, norcocaine	●	●	●	●	●	●	●	●	●
Opiates 6-MAM, codeine, hydrocodone, hydromorphone, morphine, norhydrocodone	●	●	●	●	●	●	●	●	●
Phencyclidine phencyclidine (PCP)	●	●	●	●	●	●	●	●	●
Benzodiazepines alprazolam, diazepam, midazolam, nordiazepam, oxazepam, temazepam	●	●	●	●	●	●	●	●	
Barbiturates amobarbital, butalbital, pentobarbital, phenobarbital, secobarbital	●	●	●	●	●	●	●	●	
Methadone EDDP, methadone	●	●	●	●	●	●	●		
Propoxyphene propoxyphene, norpropoxyphene	●	●	●	●	●	●	●		
Oxycodone oxycodone, oxymorphone, noroxycodone	●	●	●	●	●	●			
Meperidine normeperidine	●	●	●	●	●				
Tramadol tramadol	●	●	●	●	●				
Fentanyl norfentanyl	●	●	●	●					
Sufentanil norsufentanil	●	●	●	●					
Ketamine ketamine, norketamine	●	●	●						
Buprenorphine buprenorphine, norbuprenorphine	●	●							
Zolpidem zolpidem (e.g. Ambien®)	●								

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Resources:

- USDTL
  - http://www.usdtl.com
  - Lots of available information on website including research papers.
  - Utilizes CHILD GUARD ® Methodology for environmental exposure
  - Many Certifications/Accreditations including toxicology
- BioTap
  - https://www.biotapmedical.com/
  - LC-MS/MS used for accurate quantitative confirmation
- Send out Lab in your hospital- Build relationships!

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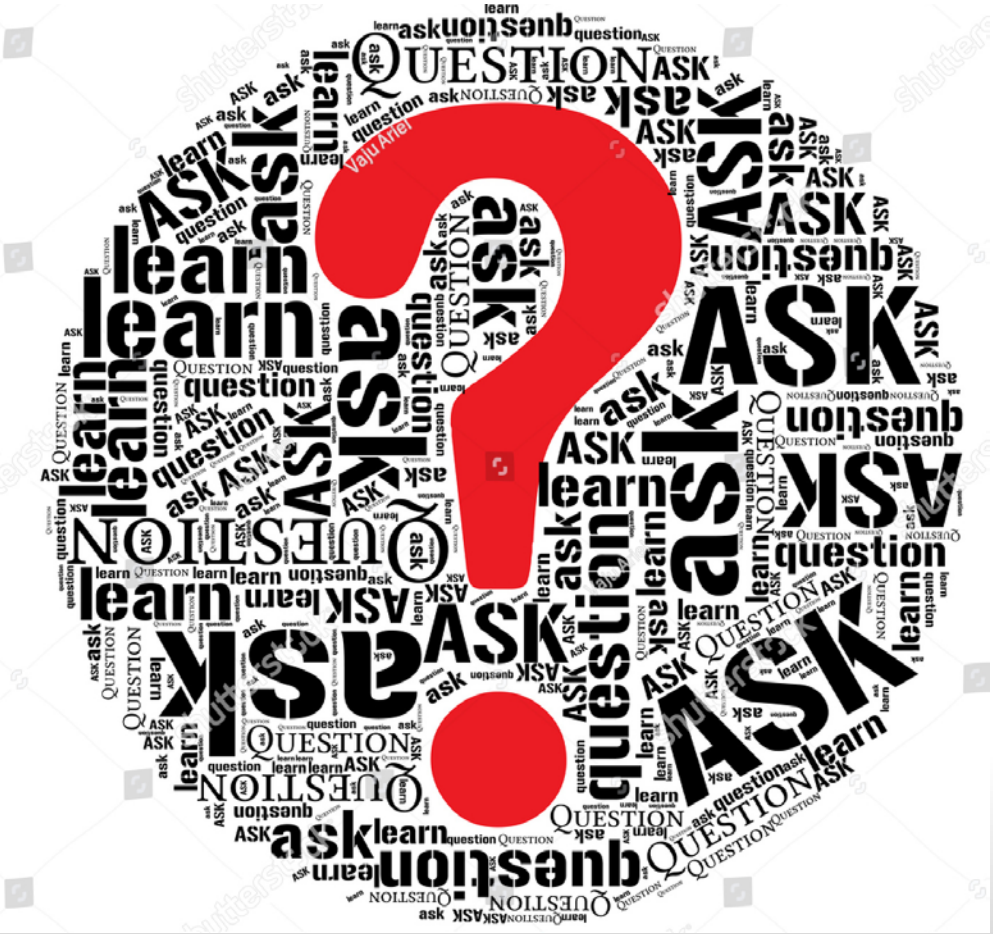
Discussion/Questions



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- Oral, R., Bayman, L., Assad, A., Wibbenmeyer, L., Buhrow, J., Austin, A., & Bayman, E. (2011). Illicit drug exposure in patients evaluated for alleged child abuse and neglect. Pediatric Emergency Care, 27(6).
- Wang, X., & Drummer, O. (2015). Review; Interpretation of drug presence in the hair of children. Forensic Science International, 257, 458-472.

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Contact Information

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