


Toxicology: The Basics for Nurse Attorneys

Allison A. Muller, PharmD,
Diplomate, American Board of Applied Toxicology



Learning Objectives

- List the expected effects on the body from common street and prescription drugs.
- Differentiate between drug/alcohol levels obtained from blood, urine, breath.
- Identify common false positives when interpreting drug screen results.
- Assess the utility of drug levels for commonly encountered street and legal drugs.
- Describe the correlation between drug and alcohol levels and level of impairment.

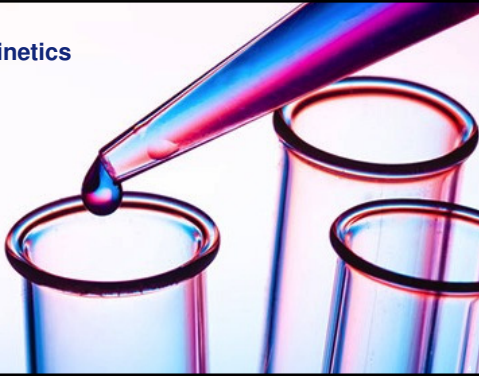
Definitions

- Metabolite
- Detection time
- Route of administration



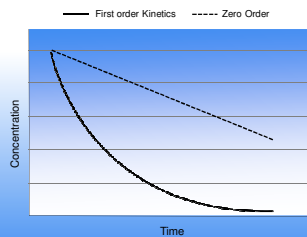
Pharmacokinetics

- Absorption
- Distribution
- Metabolism
- Elimination



Pharmacokinetics

- Elimination
 - First order versus zero order kinetics
 - Alcohol: zero “fixed” rate
 - First order “non-linear” elimination: extrapolation isn’t easy



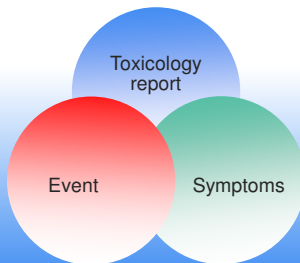
Pharmacodynamics



Toxicology Testing

- Urine, blood, hair, breath, saliva.
Which is most accurate?
- The urine drug screen ("UDS")
- Confirmatory tests

Drug-impairment



What Can Drug Levels Tell You?



What Can Drug Levels NOT Tell You?



Alcohol (ethanol)

- For a given level, behavior and impairment will vary from person to person
- There are data on substances that elevate breath alcohol levels.
- Blood levels don't lie.



The Top 3 False Negatives

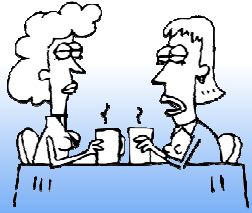
- Benzodiazepines
- Opiates
- Amphetamines



"THE FIRST TEST WAS FALSE-POSITIVE, THE SECOND TEST WAS FALSE-NEGATIVE, WHAT ARE YOU TRYING TO PULL?"

The Top 3 False Positives

- Amphetamines
- Morphine/codeine
- Phencyclidine



"I MIGHT HAVE A POSITIVE ATTITUDE...
BUT IT MIGHT BE A FALSE POSITIVE."

Common Drug Classes: *The Basics*

- Benzodiazepines
- Opiates
- Antidepressants
- Stimulants
- Muscle relaxants
- Cold medications



Benzodiazepines

- Interaction with alcohol?
- Detectable on "tox" screen?
- Are levels useful?



Opiates

- Interaction with alcohol?
- Detectable on "tox" screen?
- Are levels useful?



Antidepressants

- Interaction with alcohol?
- Detectable on "tox" screen?
- Are levels useful?



Stimulants

- Interaction with alcohol?
- Detectable on "tox" screen?
- Are levels useful?



Muscle Relaxants

- Interaction with alcohol?
- Detectable on "tox" screen?
- Are levels useful?



Cold Medications (Antihistamines/ Decongestants)

- Interaction with alcohol?
- Detectable on "tox" screen?
- Are levels useful?



Common Illegal Drugs: *The Basics*

- THC
- Cocaine
- Heroin



Case Example 1

- 52 year-old man injured while on the job.
- Initial testing
 - Positive urine drug screen for THC ("cutoff" value 50 ng/mL)
- Confirmatory testing
 - Blood test MS: 204 ng/mL ("cutoff" 15 ng/mL)

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Case Example 2

- Preschool-aged child with a + PCP result on a urine drug test after weekend at father's house.
- Brought into emergency department with uncontrolled vomiting.
- Dr tells parents she hasn't seen a +PCP result in years.
- Social work/child protective services is contacted

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Case Example 3

- 12 year-old boy with a + THC result on a urine drug test.
- Confirmatory test also reveals THC.
- Mother reports that she has been giving the child cannabidiol oil (CBD) oil for his uncontrolled seizure disorder.

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Case Example 4

- 42 year-old woman is drug tested at work. +cocaine on urine drug screen
- Confirmatory test also reveals cocaine (benzoylecgonine).
- Employee reveals that her sexual partner uses cocaine but she does not.

Allison A. Muller, PharmD, Diplomate American Board of Applied Toxicology
 Allison@AcriMullerConsulting.com
 www.AcriMullerConsulting.com
 (215) 593-5805
