

# “Selected” Components of a Successful Drug Testing Program

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# Drug Testing Specimens

- urine - current specimen of choice
  - ◆ generally readily available - large quantities
  - ◆ contains high concentrations of drugs
  - ◆ good analytical specimen
  - ◆ provides both recent and past usage
- alternative specimens
  - ◆ breath
  - ◆ hair
  - ◆ sweat - patch test
  - ◆ saliva - oral fluids
  - ◆ eye scanning devices

# When to Test?

- KEEP 'EM GUESSING !
- effective drug testing must be random
  - ◆ unexpected, unannounced, unanticipated
  - ◆ limit time between notification & testing
- test as often as possible - twice weekly
- consider use of multiple specimens (hair, saliva, sweat)
- design drug-specific testing regimes (cocaine test more frequently)
- use progressive testing strategies

# Drug Testing Reality Check

- When administering your drug testing program assume that the individuals you are testing know more about urine drug testing than you do!
- Sources:
  - ◆ Internet
  - ◆ High Times magazine
  - ◆ other tested individuals

# Which Drugs of Abuse Should be Tested? (limited universe testing)

- amphetamines (speed)
- barbiturates, benzodiazepines
- cannabinoids (THC, marijuana)
- cocaine (crack)
- opiates (heroin)
- phencyclidine (PCP)
- alcohol

Modify this drug list as necessary to reflect  
changing drug use patterns

## The “witnessed” collection (for urine)

- single most important aspect of effective drug testing program
- urine collections not witnessed are of little or no assessment value
- denial component of substance abuse requires “direct observation” collections of participants

## Sample Collection Priorities:

- site selection
- wash hands prior to donation
- collector's inspect sample
  - ◆ temperature (90-100° F)
  - ◆ color (no color → inappropriate)
  - ◆ odor (bleach, sour apples, aromatics, vinegar, etc.)
  - ◆ solids or other unusual particulates

# Two-Step Testing Approach

- screening test – designed to separate negative samples from samples that are “presumptively” positive
- confirmation test – follow-up procedure designed to validate positive test results
  - ◆ distinctly different analytical technique
  - ◆ more specific and more sensitive

# The screening methods

- often based on immunoassay technology
- more drug – more binding - more “color” produced  
– more instrument detector response
- numerous commercial manufacturers
- most “on-site” devices (POCT) use immunoassay techniques □ □ □

## Step Two - Confirmation

- gas chromatography-mass spectrometry (GC/MS)
  - ◆ drug molecules separated by physical characteristics
  - ◆ identified based on chemical “finger-print”
  - ◆ considered “gold standard”
- other chromatographic techniques

## Negative or None Detected Results

- indicates that no drugs or breakdown products (metabolites), tested for, were detected in the sample tested
- does not mean NO drugs present

# Negative/None Detected Interpretation

- donor is not using a drug that can be detected by the test OR
- donor not using enough drug
- donor's drug use is too infrequent
- collection too long after drug use
- urine is tampered
- test being used not sensitive enough

## Negative/None Detected Interpretation

- assess none detected drug testing results in the context of your client's overall program compliance (or non-compliance) and their life's skills success (or lack thereof)

# Positive Test Result Interpretation

- indicates that drug(s) or breakdown products (metabolites), tested for, were detected in the sample tested
- drug presence is above the “cutoff” level
- greatest confidence achieved with confirmation

# Drug Tests are Qualitative

- screening/monitoring drug tests are designed to determine the presence or absence of drugs - NOT their concentration
- drug tests are NOT quantitative

Drug concentrations or levels associated with urine testing are, for the most part, USELESS !

■ cocaine metabolite

~~517~~ ng/mL

■ opiates

negative

■ cannabinoids

negative

■ amphetamines

negative

# The fact is:

Urine drug concentrations are of little or no interpretative value. The utilization of urine drug test levels by programs in an effort to characterize client's drug use behavior generally produces interpretations that are inappropriate, factually unsupported and without a scientific foundation. Worst of all, these urine drug level interpretations have no forensic merit.

# Eliminate Urine Drug Levels

- urine drug testing is **qualitative**
- purpose is to determine the presence or absence of drugs  
- not to measure the quantity of drugs
- eliminating levels does not make results less *useful*
- continuing the use of levels *will* result in inappropriate consequences for the donor
- federal drug testing programs **prohibit** the release of initial screening results

# Cannabinoids - Results Interpretation

- drug specific assays
- cutoff levels: 50 ng/mL
- positive results indicate presence of cannabinoids - virtually no interferences
- difficult to separate recent from non-recent use due to lipophilic properties
- detection time: up to 10 days for heavy chronic use; 1 - 3 days for occasional use
- no passive inhalation
- Marinol<sup>®</sup>

## Recent Use versus Non-recent use (double sanction issue):

- How do programs discriminate between new drug exposure and continued elimination from previous (chronic) use ?
  - ◆ only drug that poses concern is cannabinoids
  - ◆ “two negative test” rule – two back-to-back negative drug tests post clean out
  - ◆ detection time: up to 10 days for heavy chronic use; 1 - 3 days for occasional use

# Amphetamines - Results Interpretation

- screening tests - drug class assays
- interpret positive results with caution
- some screening assays often have cross-reactivity with structurally similar compounds:
  - ◆ phenylpropanolamine - PPA
  - ◆ ephedrine
- confirm results whenever possible
- detection time: up to 4 days

# Cocaine - Results Interpretation

- drug specific assays
- positive results indicate presence of cocaine metabolites
- virtually no interferences
- positive results almost always associated with illicit drug use
- detection time: up to 3 days maximum
- negative result may not be clear indication of non-use

# Opiates - Results Interpretation

- screening tests - drug class assays
- positive results indicate presence of opiates
- most assays not reactive toward synthetic narcotic analgesics; meperidine (Demerol), propoxyphene (Darvon), methadone, pentazocine (Talwin), fentanyl (Sublimaze)
- poppy seed interference
- difficult to separate legitimate use from abuse
- detection time: up to 4 days following therapeutic use of codeine or morphine

# Alcohol testing

- screening tests specific for ethanol, ethyl alcohol
- urine, saliva, blood or breath
- positive results indicate presence alcohol
- alcohol is rapidly cleared from the body
- negative results don't necessarily document abstinence
- detection time = hours
- ALTERNATIVES alcohol can be measured transdermally
  - SCRAM, WristAS,

# Ethyl Glucuronide (EtG)

- EtG is a metabolite of ethanol, ethyl alcohol
- bio-marker for alcohol usage
- EtG was identified in 1952
- EtG remains detectable for up to five days
  - ◆ two days - single drink    five days - heavy drinking
- diagnostically & therapeutically useful
- more costly than alcohol testing
- available only from select laboratories
- becoming increasingly popular testing approach for determining continued abstinence

[www.ethylglucuronide.com](http://www.ethylglucuronide.com)

## Myth #1

- Passive inhalation of marijuana smoke can cause a “positive” drug test result.
- NO - not if standard cutoffs are used
- THC (cannabinoid) assay uses variable cutoffs (20, 50, 100 ng/mL)
- passive inhalation research indicates less than 10 ng/mL in volunteer urines
- no passive inhalation for “crack”

## Myth #2

- Advil<sup>®</sup> (ibuprofen) causes “false-positive” drug tests for marijuana
- NO!
- problem with EMIT<sup>®</sup> method corrected 15 years ago
- no medication - prescription/OTC causes “false-positive” drug tests for marijuana

## Myth #3

- Consuming poppy seeds causes “false-positive” drug tests for heroin
- NO! - but?
- poppy seeds contain trace amounts of both codeine and morphine
- can causes “positive” drug test results for “opiate” class
- confirm positive opiates

## Myth #4

- Drinking vinegar or cranberry juice will produce a “negative” urine drug test.
- NO!
- theory is to cause a “pH shift”, making the urine sample acidic - altering the chemistry of immunoassay tests
- in reality - the body detoxifies the acid & dilutes to physiological pH

## Myth #5

- consuming vitamins purges marijuana from the system - quicker clean urine (i.e. niacin - B<sub>3</sub>)
- NO!
- theory is vitamins increase metabolism
- in reality - no systemic changes
- however, vitamin DO produce urine coloration - check creatinine

# Basics of Specimen Tampering - The Three Approaches

- **dilution**: adding liquid to the sample to achieve a drug concentration below the cutoff threshold thus producing a negative result
- **adulteration**: adding a chemical masking agent to the urine to inhibit the testing procedure thus producing a negative result
- **substitution**: replacing a legitimate urine sample with a “look-a-like” alternative thus producing a negative result

# Urine Specimen Dilution

- most common form of tampering
- pre collection dilution (hydration, water loading, flushing) – consumption of large volumes of liquid before voiding
- post collection dilution - adding drug-free liquid to the sample after voiding (should not happen for witnessed collections)

## Importance of creatinine testing:

- creatinine can be measured to determine the “strength” or concentration of a urine sample
- urine with a creatinine of less than 20 mg/dL are considered “dilute” and may not reflect an accurate picture of recent drug use
- normal human creatinine levels will vary during the day based upon fluid intake - but healthy individuals will rarely produce urine samples with a creatinine of less than 20 mg/dL

## More Creatinine Facts

- rapid (60-90 minutes) ingestion of 2 - 4 quarts of fluid routinely produces low creatinine levels & negative urine drug tests within one hour
- programs are strongly encouraged to measure creatinine as a method of controlling sample dilution

# Urine Specimen Adulteration

- addition of chemical substances designed to “mask” drug presence or disrupt the testing chemistry
- post-collection tampering
- “low-tech” adulterants – common household products (bleach, soap, etc.)
- “high-tech” adulterants – commercially available products designed specifically to interfere with the testing

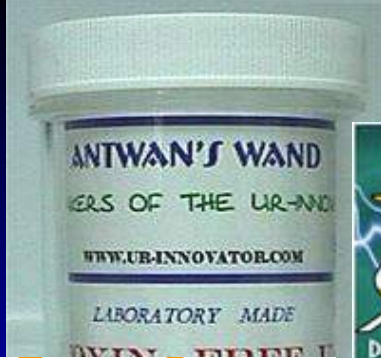
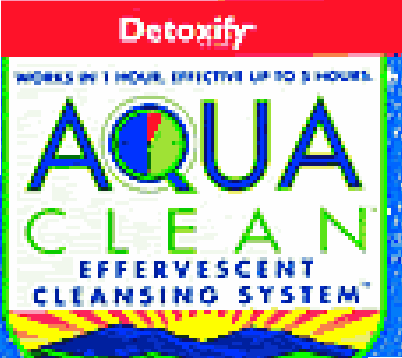
# Urine Luck™ - Specimen Adulterant

- pyridinium chlorochromate - dichromate - hydrochloric acid - hydrofluoric acid - iodine
- compromises the confirmation (GC/MS) carboxy-THC and opiates
- can also effect screening tests
- oxidizes drug and standards
- can be identified by laboratories employing specimen validity tests (SVT's)
- effects can not be reversed

# Urine Specimen Substitution

- replacing donor urine sample with another drug-free specimen
- biological substitution - someone else's "clean" urine
- non-biological substitution - replacing urine with urine "look-a-like" sample (diet Mountain Dew, water with food coloring)
- non-biologicals can be detected with creatinine testing

# URINE NEGATIVE

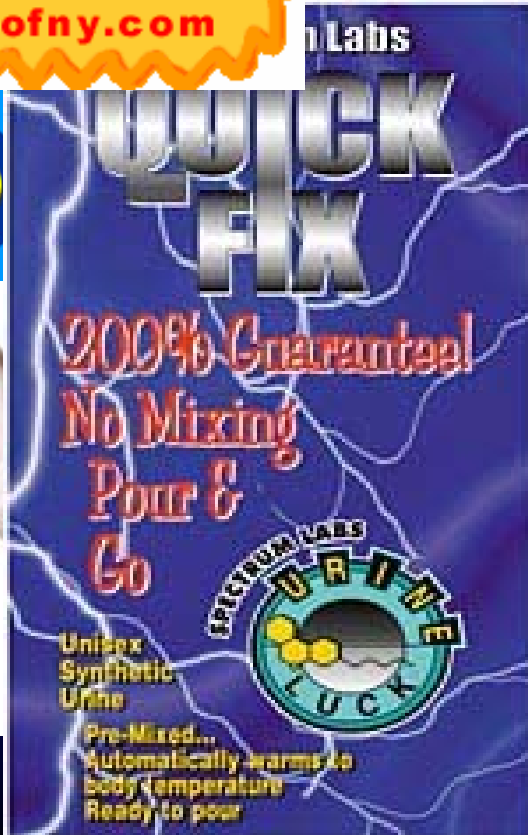
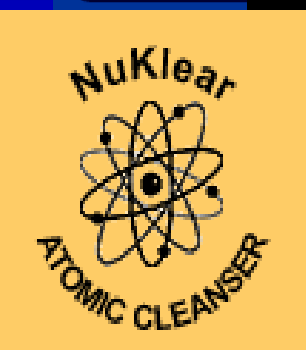


## FlushNOW

Products for passing urine drug testing

## Drug Testing & Detoxification

[www.clearchoiceofny.com](http://www.clearchoiceofny.com)



Your clients have lots of choices

# Controlling Specimen Tampering

- develop challenging collection strategy - ie. make the testing unannounced and RANDOM!
- DIRECTLY OBSERVED collections is the most effective approach to preventing adulteration and substitution
- inspect sample - train collection staff
- keep abreast of tampering techniques
- take temperature measurements (90° - 100° F)
- use specimen validity tests (SVT's) on suspect samples (available from laboratory or use SVT dipsticks with on-site devices)

# SUMMARY

- educate yourself about drug testing - understand its benefits & limitations
- train front-line & supervisory staff
- develop a “challenging” collection strategy - make sure it’s random
- institute appropriate safeguards in collection procedures to control tampering
- select appropriate testing facility or on-site methods

## SUMMARY (continued)

- choose the specimen right for your program
- drug test often !
- confirm positive screening results whenever possible
- keep abreast of tampering techniques
- challenge your program - quality assurance
- develop a relationship with drug testing experts - testing laboratory or on-site device vendor
- understand that drug testing is only one part of the overall supervision process

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