A Comprehensive Review of Drug Testing Best Practices

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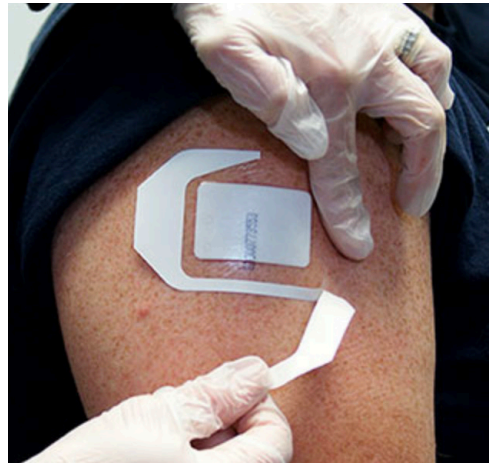
The law is not black and white and neither is science.

There is a substantial gap between the questions that the treatment court community would like to have answered by drug testing and the answers that the science is able to provide.

The danger lies in the treatment court community's failure to understand that this gap exists by continuing to draw unwarranted conclusions and by making consequential adjudication decisions from drug testing results that are *not* supported by the science.

Specimen Choices for Court-Mandated Drug Testing



Drug Testing Specimens

- no perfect specimen
- each specimen has advantages and disadvantages
- each specimen takes a slightly different picture of a participant's drug use behavior
- potential for discrepant results

Multiple Testing Specimens

- adding specimen types often increases frequency of discrepant results
- not because of errors/incorrect results
- both results often correct
- different specimens capture may different drug use detection periods

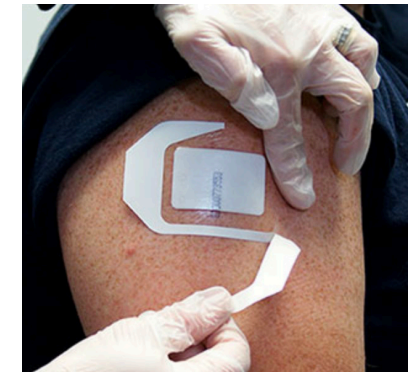
Specimen of Choice: Urine

- Advantages:
  - sample is generally available in large quantities
  - provides detection for both recent and past usage
  - drug & metabolites are concentrated, easily detectable
  - numerous testing options – Lab-based and on-site testing
  - uniform forensic criteria supported by years of court/legal case law & adjudication
- Disadvantages:
  - invasive "witnessed" collection procedures required
  - same gender collections
  - specimen is susceptible to tampering
  - drug concentration influenced by fluid intake
  - urine drug levels provide no interpretive data

Breath Testing for Alcohol

- Advantages:
  - Portable monitoring device
  - Ease of use
  - Excellent approach for alcohol surveillance
  - Allows monitoring during non-governmental hours
  - Used in the field for unannounced testing
- Disadvantages:
  - Pre-test waiting and observation period (up to 20 minutes)
  - Periodic calibration

Sweat Patch Testing



- Advantages:
  - ability to monitor 24/7 for extended periods
  - relatively client tamper-proof
  - non-invasive
  - increased deterrent to drug use
  - cross-gender collections
- Disadvantages:
  - poor past usage drug detection (prior to patch application)
  - limited collection devices & testing laboratories
  - patch application/removal requires certified collectors
  - limited number of drugs detected
  - no on-site testing

Drug Testing in Hair

- Advantages:
  - extended detection period (up to 90 days)
  - non-invasive, cross-gender collection
  - reduced specimen tampering
  - no poppy seed interference
- Disadvantages:
  - inability to detect recent drug usage
  - limited number of testing facilities
  - no on-site testing
  - testing may not detect single drug use event

Hair Testing Scenario

- Participant uses banned substance Day 1
- Hair collected on Day 14
- Results to court on Day 18 (positive)
- Participant interaction Day 20
- Sanctions/Intervention and therapeutic effect

Oral Fluids Testing

- Advantages:
  - non-invasive, cross-gender collections
  - specimen tampering reduced
  - on-site testing available (but not recommended)
  - recent advances – extended detection window; more drugs detected
- Disadvantages:
  - short detection window (most drugs 24-hour average)
  - limited collection devices & testing facilities
  - limited number of drugs detected
  - on-site testing devices pose forensic concerns regarding accuracy & reliability

Specimen Summary

- urine is the testing specimen of choice
- alternative specimens play a role
- understand advantages & disadvantages
- understand detection windows of each
- use results therapeutically
- seek advice & guidance from your testing facility

Best Practices

A. Frequent Testing

How Often to Drug Test?

- Drug and alcohol testing is performed frequently enough to ensure substance use is detected quickly and reliably.
- for urine - test as often as possible - at least twice weekly
- ankle monitors - 90 days
- tests that have short detection windows - more frequently
- testing frequency remains constant throughout phase progression

What Does the Research Say?

- More frequent testing is correlated with:
  - higher graduation rates
  - lower illicit substance use
  - lower recidivism
- Participants in treatment-oriented programs perceive drug testing as critical
- One probation study:
  - twice-weekly testing detected about 80% drug use
  - once-weekly testing detected about 35% drug use

B. Random Testing

Keep ‘Em Guessing

- The schedule of drug and alcohol testing is random and unpredictable.
- effective drug testing must be random
  - equal chance of being tested on any given day - INCLUDING weekends and holidays
  - unexpected, unannounced, unanticipated
  - limit time between notification & testing
- urine - no longer than 8 hours following notification
- four hours for oral fluids

C. Duration of Testing

Duration of Testing

- basic tenet of behavior modification provides that the effects of interventions should be assessed continually
- relapse is difficult to predict
- reduction of services comes the ever-present risk of relapse or other behavioral setback
- duration of drug and alcohol testing continues until participants are engaged in continuing-care or aftercare plan.

D. Breadth of Testing

Breadth of Drug Testing

- Drug Courts must test for the full range of substances that are likely to be used by participants in the program.
- short comings to certain limited/standards panels
  - NIDA 5 or standard eight-panel
- clients engage in evasion strategies
  - opiate switching - heroin to oxycodone
  - THC alternatives - marijuana to Spice/K2
- randomize your drug testing panels
- alternative specimen options (oral fluids)

E. Witnessed Collections

"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

Challenging Urine Collection Strategies

Sample Collection Procedures:

- pre-collection preparation
  - minimize access to water sources
  - find privacy & security
- removal of problematic clothing items
- wash hands prior to donation
- label sample correctly
- check temperature (90-100˚ F)
- forensic sample - custody & control

Developing control strategies to prevent sample tampering is critical.

Once clients understand that they cannot beat the system, they are much more likely to engage in the therapeutic process toward recovery.

The Use of Urine Creatinine Concentrations for Abstinence Monitoring in Treatment Courts

By Paul L. Cary, M.S.
Forensic Toxicologist

Paul L. Cary, M.S., retired as director of the Toxicology and Drug Monitoring Laboratory at University of Missouri in Columbia, Missouri, in 2015. For forty years, Mr. Cary was actively involved in the management of a nationally recognized toxicology laboratory. He has authored numerous scientific publications, has served on a variety of clinical and technical advisory committees, has taught at the university, is involved in drug testing research, and serves as a consultant in toxicology-related matters. He has been certified as an expert and provided expert testimony in court (local, state, and federal) and in labor arbitration and is a member of the Society of Forensic Toxicology. Mr. Cary has been a resource to treatment court teams throughout the nation and overseas for the past two decades.

Introduction

The fundamental goal of abstinence monitoring in a treatment court environment is to enable the court to evaluate a participant's compliance with program requirements—in other words, the participant's abstinence from prohibited substances. If the court is unable to reliably monitor abstinence, the ability to use rewards/incentives and sanctions as treatment intervention strategies is all but lost. If the court is unable to identify participant relapse or prohibited substance use, it is powerless to intervene therapeutically to change undesired behavior.

When urine is being used as the drug testing specimen, the monitoring of creatinine in each sample obtained is critical in establishing specimen validity. For example, if a urine specimen is determined to be dilute, the drug test may not be able to detect the presence of prohibited substances in the sample, because the concentrations of the drugs have been diluted until they are below the cutoff point of the assay. In this circumstance, test results would produce a false negative finding: prohibited substances were present, participant drug use occurred, but the testing was unable to detect the violation because the sample was more like water than urine. A dilute urine sample, regardless of whether it is intentional or not, prevents the court from evaluating a participant's abstinence.

Unlike testing for drugs, in which the analysis produces either a negative or positive result, the interpretation of urine creatinine concentrations is not always straightforward. Consequently, the therapeutic response to a urine sample that falls outside the acceptable creatinine criteria is often more complicated. This fact sheet addresses many of the issues associated with testing for urine creatinine concentrations in a treatment court context and provides guidance as to appropriate court responses to urine samples that fall outside the acceptable criteria.

G. Accurate and Reliable Testing Procedures

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

Step One – Screening

- often based on immunoassay technology
- more drug – more binding - more "color" produced – more instrument detector response
- numerous commercial manufacturers
- designed for high throughput instrumentation or on-site devices

On-site DOA screening

- often based on immunoassay technology
- concept of color “switch”
- “dynamic” versus “static” calibration
- hand-held cassettes or test-cup devices
- one test at a time - no batching
- available in DOA panels or single drugs
- numerous commercial manufacturers
  - differential sensitivity & selectivity

Step Two - Confirmation

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

Why confirm ?

- Is it really necessary to confirm drugs that tested positive by initial screening tests?
- Why can't the court adjudicate cases based on the screening test results?

- FALSE POSITIVES

Drug tests & cross reactivity:

- screening tests can and do react to “non-target” compounds
  - amphetamines
  - benzodiazepines
  - opiates
- obtain list of interfering compounds from lab or on-site test vendor
- initial screening (“instant” tests) may only be 60-70% accurate
- confirm positive results

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 !

- cannabinoids — ~~115~~ ng/mL
- opiates — negative
- cocaine metabolite — negative
- amphetamines — negative

Are any of the following questions being asked in your court?

- How positive is he/she?
- Are his/her levels increasing or decreasing?
- Is that a high level?
- Is he/she almost negative?
- Is this level from new drug use or continued elimination from prior usage?
- What is his/her baseline THC level?
- Does that level indicate relapse?
- Why is his/her level not going down? (or up?)

THE ISSUE

Urine drug concentrations are of little or no interpretative value. The utilization of urine drug test levels by drug courts generally produces interpretations that are inappropriate, factually unsupportable and without a scientific foundation. Worst of all for the court system, these urine drug level interpretations have no forensic merit.

National Drug Court Institute
Karen Freeman-Wilson, Executive Director
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Drug Court Practitioner

Fact Sheet

Urine Drug Concentrations: The Scientific Rationale for Eliminating the Use of Drug Test Levels in Drug Court Proceedings

By Paul L. Cary, M.S.

Preface

As the title implies, the objective of this fact sheet is to provide drug court professionals with a scientifically based justification for discontinuing the interpretation of urine drug levels in an effort to define client drug use behavior. As the premise of this document is not without some controversy, clarification of its intent seems warranted.

This fact sheet is intended for drug court practitioners who are routinely engaged in the interpretation and evaluation of urine drug testing results for the purpose of participant case adjudication, particularly client sanctioning. Given that most drug courts do not have routine access to biomedical or pharmacological expertise, this fact sheet recommends that the use of urine drug concentrations be eliminated from the court's decision-making process in order to protect client rights and ensure that evidentiary standards are maintained.

It is not the intention of this document to prohibit the interpretation of laboratory data by qualified scientists. Nor is it the objective of this fact sheet to assert that urine drug levels have no interpretative value. However, drug court practitioners are cautioned that the interpretation of urine drug levels is highly complex and even under the best of circumstances provides only limited information regarding a participant's drug use patterns. Further, such interpretations can be a matter of disagreement even between experts with the requisite knowledge and training to render such opinions.

It is for these stated reasons that the NDCI strongly encourages drug court programs to utilize the information contained herein to evaluate their drug testing result interpretation practices. This organization recognizes that the use of urine drug levels to assess client behavior may be widespread and longstanding. However, because courts rarely have the necessary toxicology expertise, the routine use of urine drug levels by court personnel in formulating drug court decisions is a practice that in most cases would not withstand scientific or judicial scrutiny. It is hoped that this fact sheet will serve as the foundation for those drug court programs routinely interpreting urine drug levels to transition to a strictly qualitative (positive or negative only) result format. Drug courts are also encouraged to seek expert toxicology advice when necessary and appropriate to assist in the interpretation of testing data associated with challenging cases.

Scientific Rationale

- Technical Issues
  - testing not linear
  - tests measure total drug concentrations
- Physiological
  - variability of urine output
  - differential elimination of drug components

THIS ?

432 indicates he going up, right?

is 22 above the cutoff?

does 219 mean new use?

307 – well she's almost negative, correct?

639 is really high for THC, isn't it?

115 is down from yesterday, probably continued elimination?

I think 1200 is a new record, isn't it?

515 is much higher than last week, right?

don't we need to consider relapse at 57?

OR THIS ?

Negative or Positive

Interpretation of Drug Test Results

Negative Drug Test Results:

- indicates that no drugs or breakdown products (metabolites), tested for, were detected in the sample tested
- no such thing as “zero” tolerance or “drug free”
- negative does not mean NO drugs present

Negative Result Interpretation:

- client is remaining abstinent from prohibited substances and is compliant

Other possible explanations

- client not using enough drug
- client's drug use is too infrequent
- collection too long after drug use
- sample has been tampered
- test being used not sensitive enough
- client using drug not on testing list

Negative/None Detected Interpretation

- no need to second-guess every "negative" result
- not suggesting withholding positive reinforcement & rewards for positive behaviors
- drug testing is a monitoring tool
- 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
- ALWAYS confirm positive results in original sample

H. Rapid Results

Timing is Everything

- timing is one of the most influential factors for success in a behavior modification program
- the sooner sanctions are delivered after an infraction and incentives delivered after an achievement, the better the results
- Test results, including the results of confirmation testing, are available to the Drug Court within forty-eight hours of sample collection

Timing is Everything

- study of 70 drug courts show:
- significantly greater reductions in criminal recidivism and significantly greater cost benefits when the teams received drug and alcohol test results within forty-eight hours of sample collection
- 73% more effective at reducing crime and 68% more cost-effective

I. Participant Contract

Paint Roadmap for Success

- Upon entering the Treatment Court, participants receive a clear and comprehensive explanation of their rights and responsibilities related to drug and alcohol testing
- outcomes are significantly better when Treatment Courts specify their policies and procedures clearly
- participants significantly more likely to react favorably to an adverse judgment if they are given advance notice about how such judgments are made

The Importance of "Specificity" in a Client Contract:

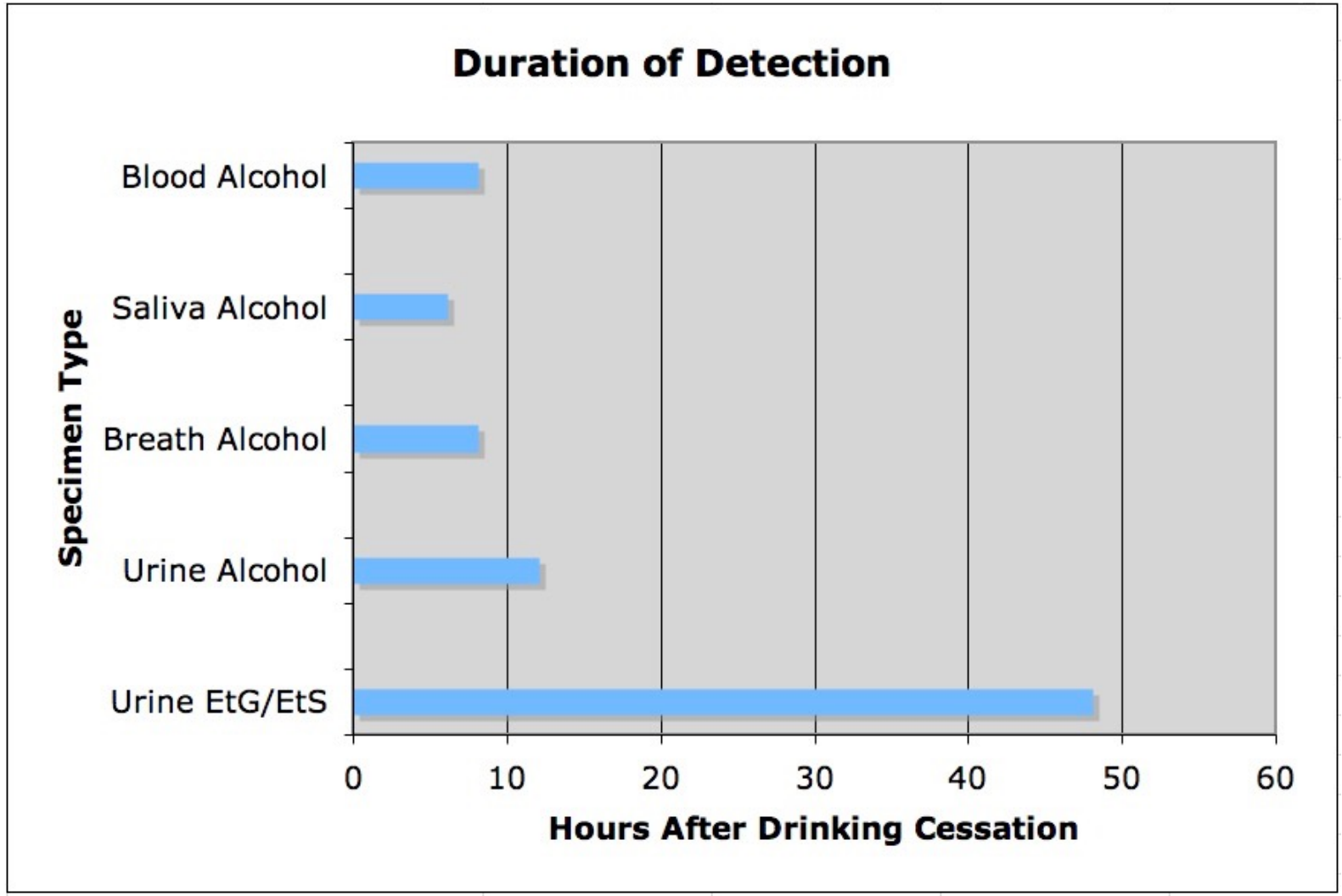
- explain drug testing procedures – consequences for failure
- location & time
- late for a test or missed test
- failure to produce a urine specimen sample of insufficient quantity
- production of dilute urine sample
- substituting or altering a urine specimen

EtG & EtS – Strategy for Monitoring Alcohol Abstinence

Advantages of Ethyl Glucuronide & Ethyl Sulfate

- unique biological marker of alcohol use (no false positives)
- direct marker indicating recent use
- longer detection window than alcohol
- stable in stored specimens (non-volatile)
- is not formed by fermentation
- is not detected in the urine of abstinent subjects

Extending the detection window



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Disadvantages of EtG/EtS

- testing available at relatively few laboratories
- EtG testing more costly than abused drugs
  - expensive LC/MS/MS technology
- introduction of new testing approaches

- most significant concern – casual, inadvertent, environmental alcohol exposure causing positive results

Sources of "Incidental" Alcohol Exposure

- OTC medications (Nyquil, Vicks Formula 44)
- mouthwashes (Listermint & Cepacol)
- herbal/homeopathic medications (i.e., tincture of gingko biloba - memory)
- foods containing alcohol (such as vanilla extract, baked Alaska, cherries jubilee, etc.)
- "non-alcoholic" beers (O' Doul' s, Sharps)
- colognes & body sprays
- insecticides (DEET)
- alcohol-based hand sanitizers (Purell, GermX)

Consensus Cutoffs:

- EtG minimum of 500 ng/mL
- EtS minimum of 100 ng/mL

Specimen Tampering

Basics of Specimen Tampering - The Three Approaches

- dilution
- adulteration
- substitution

Urine Specimen Adulteration

- addition of foreign substances designed to “mask” drug presence
- post-collection tampering
- low-tech adulterants that cause “pH shift” (lime, vinegar, bleach, ammonia, lemon, drano)
- low-tech adulterants that disrupt testing chemistry (salt, methanol, detergent)
- “high-tech” adulterants

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

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 laboratory employs specimen validity tests & use with on-site devices

Drug Testing is a *TOOL*!

- drug testing, as an abstinence monitoring strategy, is just one assessment option
- don't become myopic regarding drug testing results
- consider all of the client behavioral data
- consider the therapeutic ramifications of results & adjudicate to support recovery

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