Ten Priceless Pearls for Successful Drug Testing

By: Paul L. Cary
Toxicology Laboratory
University of Missouri

Definition of a “pearl”

A nugget (or “pearl”) of useful or valuable information that, in and of itself, provides priceless insight and/or precious understanding.

Pearl #1: “Eighty percent of success is just showing up.”

Woody Allen

The Importance of "Specificity" in a Client Contract:

- Client contract as a therapeutic tool
- I will be tested for the presence of drugs in my system on a random basis according to procedures established by the Drug Court Team and/or my treatment provider.
- I understand that I will be given a location and time to report for my drug test.
- I understand that it is my responsibility to report to the assigned location at the time given for the test.

The Importance of "Specificity" in a Client Contract:

- I understand that if I am late for a test, or miss a test, it will be considered as a positive test for drugs/alcohol and that I may be sanctioned.
- I understand that if I fail to produce a urine specimen or if the sample provided is not of sufficient quantity, it will be considered as a positive test for drugs/alcohol and that I may be sanctioned.
- I have been informed that the ingestion of excessive amounts of fluids can result in a diluted urine sample and I understand that my urine sample will be tested to ensure the sample is not dilute.

The Importance of "Specificity" in a Client Contract:

- I understand that if I produce a dilute urine sample it will be considered as a positive test for drugs/alcohol and that I may be sanctioned.
- I understand that substituting or altering my specimen or trying in any way to modify my body fluids for the purposes of changing the drug testing results will be considered as a positive test for drugs/alcohol and will result in sanctioning and may be grounds for immediate termination from drug court.

Pearl #2: Make Them Pee Until They're Pissed Off!

Anonymous

Drug Testing Specimens

- urine - current specimen of choice
  - generally readily available - large quantities
  - contains high concentrations of drugs
  - good analytical specimen - 40-years of data
  - provides both recent and past usage
  - most recognized method in court
- alternative specimens
  - breath
  - hair
  - sweat - patch test
  - saliva - oral fluids

Cautionary Note - Mixing Specimen Types:

- Day 1 - client drug use
- Day 3 - urine drug test collected
- Day 5 - urine drug test results yield positive result
- Day 6 - client informed of positive results
  - denial
  - excuses
  - client advocate
- Day 8 - hair sample collected - testing produces negative results (hair containing drug not collected)
- Each specimen provides a different profile of drug use history

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
- don't reduce testing frequency as a reward for continued abstinent behavior

Drug Testing Reality Check

- When developing and administering your drug testing program assume that the participants you are testing know more about urine drug testing than you do!
- Sources:
  - Internet
  - High Times magazine
  - other court clients

Pearl #3: "You Can Observe a Lot Just by Watching."

Yogi Berra

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:

- pre-collection preparation
  - site selection
    - minimize access to water sources
    - use an area with a scant floorplan
    - find privacy & security
  - gather supplies beforehand
  - obtain proper collection receptacle
- removal of outer clothing

Sample Collection: (continued)

- wash hands prior to donation
- "witness" collection
  - additional clothing removal
  - body inspection
  - squat and cough
- label sample correctly

Sample Collection: (continued)

- accept sample & inspect
  - temperature (90-100˚ F)
  - color (no color ➔ diluted ?)
  - odor (bleach, sour apples, aromatics, vinegar, etc.)
  - solids or other unusual particulates
- store sample properly
- forensic sample - custody documents

Pearl #4: “If you don't know where you are going, you will wind up somewhere else.”

Yogi Berra

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

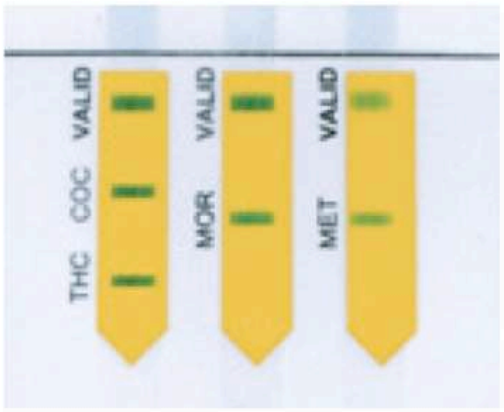
Step One – Screening

- 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

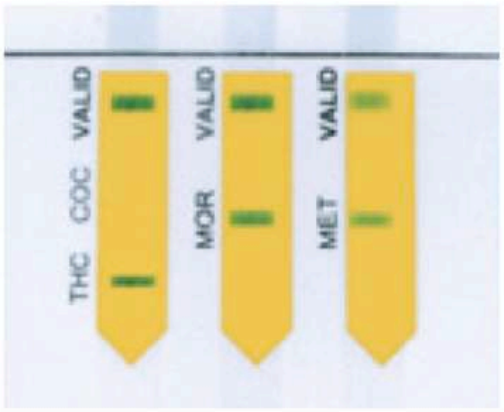
On-site DOA screening

- 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

On-site Drug Detection:



Read the results. Any band, even if faint, partial, or broken, indicates a negative result. The absence of color is a presumptive positive result.



Follow package insert guidance exactly!

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

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
- obtain list of interfering compounds from lab or on-site test vendor
- initial screening ("instant" tests) are only 60-70% accurate
- confirm positive results

Pearl #5: Drug testing can be used to show the presence of drugs, but never to show their absence.

Edsger Dijkster, a Dutch computer scientist

Negative or None Detected 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/None Detected Interpretation

- client is not using a drug that can be detected by the test

<u>Other possible explanations</u>

- client not using enough drug
- client's drug use is too infrequent
- collection too long after drug use
- urine is 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

What is a “cutoff” level ?

- a drug concentration, ***administratively*** established for a drug test that allows the test to distinguish between negative and positive sample - “threshold”
- cutoffs are not designed to frustrate CJ professionals
- cutoffs provide important safeguards:
  - scientific purposes (detection accuracy)
  - legal protections (evidentiary admissibility)
- measured in ng/mL = ppb

Pearl #6: If their lips are moving - they're lying.

Many People

Client Accountability:

- the court should not assume the role of client "excuse evaluator"
- clients need to be held responsible for their own behavior and maintaining a drug-free physiology
- if testing performed appropriately (with confirmation) –
- HOW the drug got into their sample is mostly irrelevant
- a positive drug test results put the client in violation
- as a practical and resource matter – the court cannot afford to argue over or dispute with every client who has a positive test result or comes up with a new excuse

Therapeutic Use of Test Results

- Isn't any amount of drug in a client's sample a violation worthy of sanction?
  - punishment model vs. therapeutic model
- therapeutic – enhance behaviors that lead to recovery
- learning to live with addiction is a gradual process
- elimination of client resistance to change is critical
- drug testing is a large component of the drug court experience
- its perceived fairness is critical to outcomes

Therapeutic Use of Test Results

- drug testing has the potential to build resistance
- particularly if a client is falsely accused
- it may be better to let a client "get away with one"
- risk a false accusation & re-establishment of resistance
- resistance leads to learned helplessness & loss of engagement
- clients should be held responsible
- consequences are critical to outcomes But . . .
- the prudent use of drug testing results can certainly enhance the path to recovery

Read Between the Lines:

- Is the excuse a complete denial?
  - "your test is wrong"
  - resistance to change
- Does the excuse admit to use?
  - "yes, I used by accident"
  - evidence of therapeutic progress/regression?
- Excuse as diagnosis
  - "used to escape the voices"
  - sign of co-occurring disorders

Pearl #7: "Not everything that can be counted counts, and not everything that counts can be counted."

Albert Einstein

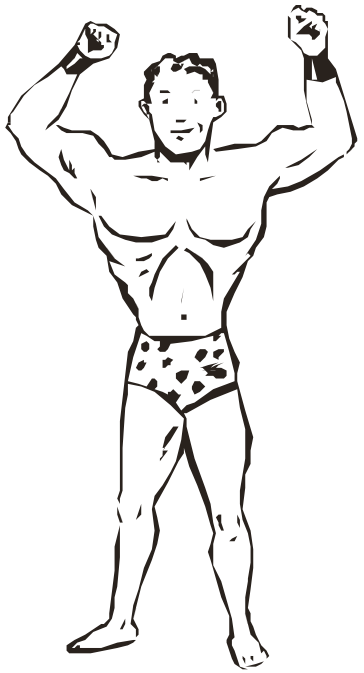
Drug Tests are Qualitative

- 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 — 517 ng/mL
- opiates — negative
- cocaine metabolite — negative
- amphetamines — negative

The Twins



A

B

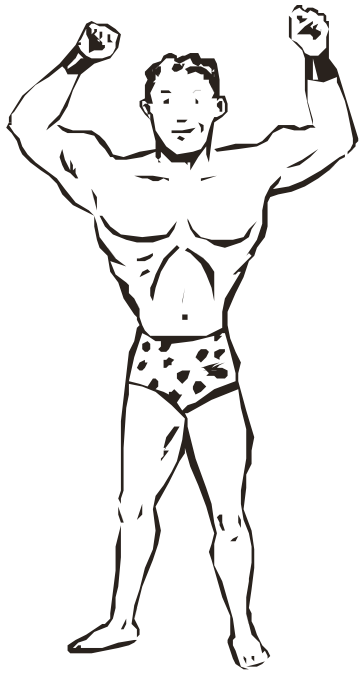
200 mg Wonderbarb
@ 8:00 AM

Collect urine 8:00 PM
12 hours later

The Twins - urine drug test results

A

Wonderbarb = 638 ng/mL



B

Wonderbarb = 3172 ng/mL

The Twins - urine drug test results

A

physiological make up

exact amount drug consumed

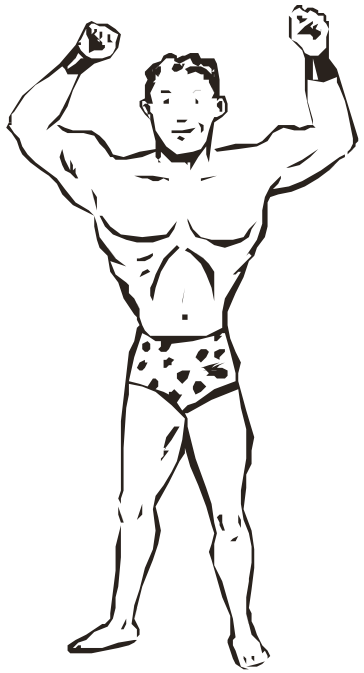
exact time of ingestion

exact time between drug exposure and urine collection

AND YET . . . . .

B

The Twins - urine drug test results



Twin B's urine drug level is 5 times higher than Twin A

A

Wonderbarb = 638 ng/mL

B

Wonderbarb = 3172 ng/mL

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 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.

Scientific Rationale

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

National Drug Court Institute
Karen Freeman-Wilson, Executive Director
January 2004 Vol. IV, No. 1

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.

Pearl #8: “Time is nature's way of keeping everything from happening all at once.”

Woody Allen

Defining the drug detection window:

- the length of time in days following the last substance usage that urine samples will continue to produce positive drug test results
- the number of days until last positive
- NOT - how long drugs will remain in a client's "system"
- most problematic drug: marijuana

Cannabinoid Detection in Urine

- Conventional wisdom has led to the common assumption that cannabinoids will remain detectable in urine for 30 days or longer following the use of marijuana.
- RESULT:
  - delay of therapeutic intervention
  - hindered timely use of judicial sanctioning
  - fostered denial of marijuana usage by clients

Cannabinoids - Recent/Relevant Research

- 30+ day detection window often exaggerates duration of detection window
- reasonable & pragmatic court guidance
- detection time: at 50 ng/mL cutoff
  - up to 3 days for single event/occasional use
  - up to 10 days for heavy chronic use
- detection time: at 20 ng/mL cutoff
  - up to 7 days for single event/occasional use
  - up to 21 days for heavy chronic use

National Drug Court Institute
Karen Freeman-Wilson, Executive Director
April 2006 Vol. IV, No. 2

Drug Court Practitioner

Fact Sheet

The Marijuana Detection Window: Determining The Length of Time Cannabinoids Will Remain Detectable in Urine Following Smoking

A Critical Review of Relevant Research and Cannabinoid Detection Guidance for Drug Courts

By Paul L. Cary, M.S.

Preface

The duration of the urinary cannabinoid detection window is not settled science. The number of days, following the cessation of marijuana smoking, necessary for cannabinoids to become non-detectable using traditional drug testing methods is the subject of debate among forensic toxicologists and a matter of on-going scientific research. This article makes no pretense to limit this important discussion, but rather, seeks to enhance it. It is hoped that drug court practitioners will find that this information clarifies some of the complex issues associated with the elimination of marijuana from the human body.

Conventional wisdom has led to the common assumption that cannabinoids will remain detectable in urine for 30 days or longer following the use of marijuana. These prolonged cannabinoid elimination projections have likely resulted in the delay of therapeutic intervention, thwarted the timely use of judicial sanctioning, and fostered the denial of marijuana usage by drug court participants.

This review challenges some of the research upon which the 30-plus day elimination assumption is based. Careful scrutiny of these studies should not be interpreted as an effort to discredit the findings or the authors of this research. However, as our knowledge evolves, the relevancy of previously published scientific data should be evaluated anew. One fact is clear—more research is needed in the area cannabinoid elimination.

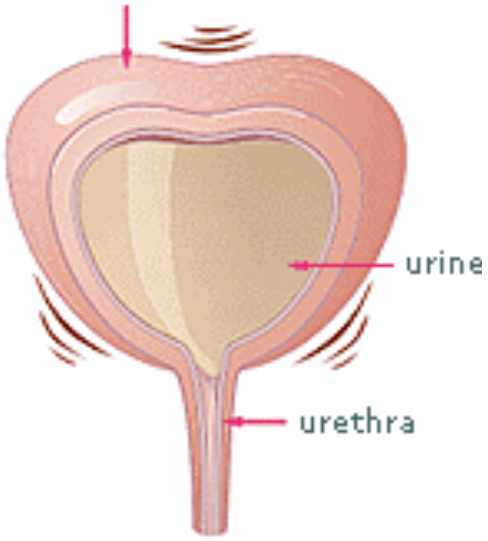
Pearl #9: “People who drink light "beer" don't like the taste of beer; they just like to pee a lot.”

Pamela Anderson

What is creatinine ?

- creatinine is produced as a result of muscle metabolism
- creatinine is produced by the body at a relatively constant rate throughout the day
- creatinine is a compound that is unique to biological material (i.e. urine, other body fluids)
- creatinine measurements can:
  - determine the "strength" or concentration of a urine sample
  - ensure the sample being tested *IS* urine

EVERY urine sample used for drug detection should be tested for creatinine!



DILUTION

Client has a bladder full of urine with a drug concentration of greater than the cutoff level of the test - thus producing a positive result.

Urine in the bladder is diluted by the consumption of large amounts of non-drug containing fluid; which results in a drug concentration that is less than the cutoff level of the test - thus producing a negative result.

Water contains no drugs!

- easiest, cheapest, simplest
- urines with a creatinines of less than 20 mg/dL are considered “dilute” and rarely reflect an accurate picture of recent drug use
- dilute samples are more like water than like urine
- all drug court/criminal justice samples should be screened for creatinine

How are creatinine measurements used ?

- normal human creatinine levels will vary during the day based upon fluid intake - healthy individuals will rarely produce urine samples with creatinines of less than 20 mg/dL
- incidence of creatinines less than 20 mg/dL in a "normal" population is approximately 1%
- urines with a creatinines of less than 20 mg/dL are considered "dilute" and often do not reflect an accurate picture of recent drug use

How much consumption?

- rapid ingestion (90 minutes) of 2-4 quarts of fluid will almost always produce low creatinines & negative urine drug tests within one hour
- recovery time of urine creatinine and drug concentrations can take up to 10 hours
- incidence of drugs in urine of diluted specimens is over 5 times greater than in samples with normal creatinine levels

“Dilute” Result Interpretation:

- negative or none detected results should never be interpreted as indicating no drug use (abstinence), because if, in fact, drugs were present, they probably could not be detected by the test

- positive drug test results from a dilute sample however, are considered valid (donor was not able to dilute the sample sufficiently to deceive the test)

Pearl #10: It's not cheating, unless you get caught

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

Last Pearl: All saints have a past and all sinners have a future

Oscar Wilde

email address:

- carypl@health.missouri.edu