

The Effective Use of Urine Creatinine Measurements in Abstinence Monitoring

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The most common form of specimen tampering is sample dilution.

Creatinine testing is a specimen validity issue!

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

You can't intervene to change
behavior if you don't know a
client has relapsed!

Defining Client Expectations

The Importance of “Specificity” in a Client Contract:

- “I understand”
- 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 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.

The Importance of “Specificity” in a Client Contract:

- 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.
- 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.

- Ensure clients understand the court's expectations & compliance benchmarks.
- Start the conversation about “dilute” samples on DAY ONE !
- Have your judge address this issue with all new clients - in open court.
- Remind, remind, remind.

What Is Creatinine & Why Measure It?

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

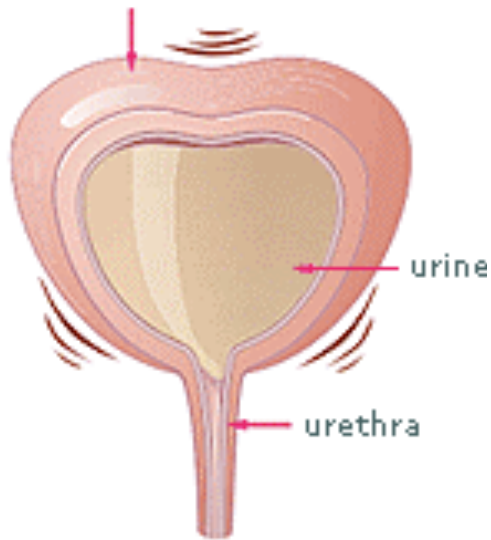
Two Types of Urine Specimen Dilution

- pre collection dilution
 - ◆ consumption of large quantities of fluids *prior* to collection
- post collection dilution
 - ◆ adding fluid to specimen *post* collection

Pre-Collection Dilution

- high-volume ingestion of fluids (water loading, flushing, hydrating, etc.)
- may be in conjunction with products designed to “enhance” drug elimination or removal of drugs (Gold Seal, Clean ‘n Clear, Test-Free, Naturally Klean, etc.)
- no evidence these products have any additional effect on drug elimination

Creatinine & Dilute Samples



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
- incidence of low creatinines in a population undergoing random drug testing is significantly (up to 10 times) greater than a non-drug tested population

The “Normal” Urine Creatinine

- normal urine creatinine: 2005 study “Urinary Creatinine Concentrations in the U.S. Population” determine the mean (based upon 22,245 participants) was 130 mg/dL
- study was not associated with drug testing
- subjects came from a variety of ethnic groups
- samples were collected AM, mid-day, and PM
- less than 1% below 20 mg/dL
- less than 1% greater than 400 mg/dL

How are creatinine measurements used ?

- urine samples with a creatinine of less than 20 mg/dL should be considered “dilute”
- a dilute sample does not accurately reflect the recent drug use history of the person being tested
- 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
- meets a “preponderance” standard

Creatinine Facts

- some diseases that produce low urinary creatinines
 - ◆ muscle wasting disease - RARE
 - ◆ some kidney ailments - RARE
- low creatinines ARE NOT routinely associated with:
 - ◆ pregnancy
 - ◆ diabetes
 - ◆ obesity
 - ◆ exercise
 - ◆ high-blood pressure
 - ◆ being vegetarian

More Creatinine Issues

- 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

“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)

The “Inadvertent” Dilute

- “My sample is dilute because I work as a roofer, on a black roof, in the middle of August when the temperature is 400° F.”
- it is possible for a client to achieve a urine creatinine of less than 20 mg/dL under extreme conditions
- court needs to develop creative solutions:
 - ◆ collect samples before work
 - ◆ collect samples on days off
 - ◆ use alternative specimens

Creatinine Sanctions

- no national standard
- adjudicate as “positive” sample - court utilizes positive sample sanctions
- adjudicate as “tampered” sample - more severely than positive sample
- adjudicate as “dilute” sample - unique sanctions
- some courts allow one “dilute” sample per phase/quarter
- regardless of sanction - court MUST address this issue

Two final thoughts about dilute urine samples

- a creatinine of less than 20 mg/dL (associated with a drug test) is nearly always an attempt by the donor to avoid drug use detection - REGARDLESS of how much liquid was consumed in order to achieve this result
- place a dilute sample prohibition in your client contract and sanction for repeat dilute samples

Creatinine Patterns

It's not just about "below 20 mg/dL"

- "normal" health persons, urine creatinine levels don't fluctuate widely day-to-day
- clients always producing "low" creatinine levels should undergo medical surveillance
- unexplained, steep decreases (or increases) in urine creatinine levels may indicate tampering
- tracking urine creatinine patterns can augment a court's understanding of relapse cycles

Are these fluctuations normal?

Date	Creatinine Level mg/dL
May 12	150.8
May 16	138.3
May 19	107.0
May 24	59.1
May 27	17.4
June 1	138.1
June 3	142.8
June 6	127.6
June 9	13.9
June 10	22.3
June 13	117.9
June 16	133.5

Average UCL =
131 mg/dL

@ 59.1 - increased
surveillance?

Highly unlikely these
dilute samples are
the result of illness

Consider LOD
testing

Doctor Relationship

- doctor - patient relationship
- drug court practitioner's role
 - ◆ client monitoring/supervision
- doctor's trained to be patient advocates
- doctor as co-dependent
- no dynamic for change
- insist on "proof" of cause-effect claims
- reach out to healthcare professionals

“High” Urine Creatinine Concentrations

The Creatine Supplement Issue:

- creatine is the pre-cursor of creatinine
- creatine supplements may increase the amount of creatine in the muscles
- muscles may be able to generate more energy or generate energy at a faster rate
- creatine supplements (along with training) may improve performance by increasing energy for activities such as sprinting and weightlifting
- but that's NOT why our clients take it!

The Creatine Supplement Issue:

- consuming over-the-counter creatine can disguise pre-collection hydration and a diluted urine
- creatine converted to creatinine will mask the dilution efforts
- in reality - very difficult to coordinate the intake timing and volume of creatine and dilution liquid
- creatinine greater than 300 mg/dL - increased monitoring
- creatinine greater than 400 mg/dL - sanctionable

Specific Gravity

What is Specific Gravity?

- measure of total dissolved solids in a liquid
- urine SpGr includes creatinine
- alternative method of determining sample dilution
- introduced in 1988 with federal workplace drug testing
- common test performed by “forensic” labs

Specific Gravity in Criminal Justice Testing

- not received widespread use by criminal justice
 - ◆ more technical difficult test
 - ◆ result interpretation much more complex
- non-federal labs use three-place measurements
 - ◆ 1.004
- federal labs use four-place measurements
 - ◆ 1.0037

My Advice on Specific Gravity

- use creatinine levels only to define “dilute” samples
 - ◆ samples less than 20 mg/dL
 - ◆ federal workplace rules don't apply
 - ◆ creatinine only - science-based approach
 - ◆ very defensible policy
 - ◆ easier to understand & explain to both clients & court professionals than SpGr

SUMMARY

- TEST FOR CREATININE!
- incorporate creatinine guidance in your SOPs and client contract
- institute a dilute sample prohibition
- understand low urine creatinine levels are NOT normal
- dilute samples are nearly always an attempt by the donor to avoid drug use detection
- sanction for repeat dilute tests

Confront Specimen Tampering with Facts:

- actively engage clients about tampering issues
 - ◆ illustrates court's tampering knowledge
- discuss specimen tampering in court
- prepare a fact-based presentation on the myths of tampering
 - ◆ highlights the futility of tampering
- testimony from former clients
- constantly reinforce the “honesty” component of drug court

Engage clients in an honest discussion regarding tampering!

Prepare a fact-based presentation on the myths of tampering – what does that mean?

Test pure platinum sucks

I stayed clean for 16 days prior to the test. Two days before the test I started drinking water and cranberry juice. I managed to put down almost three gallons of water, 6 pre-cleanse capsules, and a jug of cranberry juice. I stopped hydrating around 11pm the evening before the test that was scheduled for 10:30 the next morning. I was up at 6:30am and drank one glass of water. At 8:00 I slammed the big bottle of test pure platinum magnum force. I waited the fifteen minutes and refilled with water and casually drank that over the next 45min while urinating as directed at least 3 times. The sample was like a neon yellow! The tester placed the drops on the card and waited the required 5 min max time. I was getting nervous as he kept looking down at the test card. Then he picked it up and went to his supervisor. He explained they would have to send it in for further testing and my pre employment physical would have to be re-scheduled. They called and told me I failed. I am sending in for a refund on the \$50.00 bottle of "Snake Oil". They claim a 300% money back guarantee. We'll see.



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Drug Testing Myths: Things That DO NOT Help You Cheat on Drug Tests

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Tags: drug, testing, pass, fail, tips, help, how to, cheat, not, bad, worst, myths

Various techniques have been running around for some time on how to beat a urine drug test. Most of these techniques are known and the tests and testing methods have been adjusted to compensate for their use. Let's look at some of the most common techniques that do NOT work!

- Drink Lots of Water
- Drink Cranberry or Fruit Juices
- Take Goldseal
- Drink Pickle Juice
- Force Frequent Urination
- Drink Vinegar
- Excessive Exercise
- Shave Your Scalp
- Take Diuretics
- Take Aspirin
- Place Ammonia in Sample
- Place Bleach in Sample
- Place Drano in Sample
- Place Juice in Sample
- Place Visine in Sample
- Over Consumption of Protein, Fat and/or Carbohydrates

Method 2: Flushing Urinary System

Pros: -

Cons: Marijuana metabolite levels decreased significantly, and results frequently switched from positive to negative after a volunteer consumed 1 gallon of water. But the creatinine levels dropped below the cutoff after intake of just 2 quarters. (Cone EJ, Lange R, Darwin WD. In vivo adulteration: excess fluid ingestion causes false negative marijuana and cocaine urine test results. J Anal Toxicol. 1998;22:460-473). You should understand that you are very likely to be found out using this unwise method because labs are required to test the creatinine in all regulated specimens, and to test specific gravity for specimens with creatinine less than 20 mg/dL. ([SAMHSA MRO Manual](#))

detOKs.com recommends: Don't fail because of a "diluted result"

Given that sanctions are critical to positive therapeutic outcomes, tampered samples that fail to provide accurate data about relapse seriously compromise the recovery process.

Denial is a huge component of substance abuse - as such, clients will deny “dilutes” in the same visifious manner as positives.

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

Perform urine creatinine testing
on EVERY drug court sample!

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