STERLING
NEWS & NOTES

A Report from Sterling Reference Laboratories

First Quarter, 2007 – TECHNICAL CONTENT

CREATININE

What is creatinine?
Urine is an aqueous solution. Its major constituents are primarily electrolytes, metabolic excretory products and other substances eliminated through the kidneys. Creatinine is one such metabolic excretory product spontaneously formed from creatine in muscle. Creatinine is a metabolic byproduct of normal muscle metabolism and is excreted at a fairly constant rate throughout the day. In general the concentration of creatinine in the urine is a reflection of water intake.

Why do we use this test?
Creatinine levels are use to determine the relative dilution or concentration of a specimen. Increased water intake will typically result in a lower creatinine level. This is important, because as fluid intake increases, recovery of any drug present in a specimen decreases such that excessive fluid intake can make lower levels of drug undetectable. This is a particularly effective strategy when trying to hide or mask marijuana use.

How do I interpret a creatinine level?
Normally hydrated individuals will have creatinine levels in the range of 75 to 350 mg/dL, with most values for adequately hydrated individuals falling between 100 and 250 mg/mL. When creatinine levels are below 50 mg/dL results are beginning to be significantly adversely influenced by fluid intake. Any specimen that has a creatinine level below 20 mg/dL is unacceptably dilute. It will be flagged as out of range, and a specific gravity test will be performed to further assess the degree of dilution.

What does the Specific Gravity tell me?
Specific gravity (S.G.) is a measure of dissolved solids in urine and is used to give us more information about the dilute nature of a specimen. We can measure these parameters and use the results to establish the likelihood that a specimen might be less than ideal for assessing an individual's drug free status. A urine specimen from an adequately hydrated individual will have an S.G. of 1.015 $\pm$ .005. Dilute specimens will generally have an S.G. of about 1.005 or less.

Does this data provide any other information?
There are additional interpretations that are based on federal standards related to the combination of creatine and S.G. results. The SAMHSA definition for a specimen to be labeled as dilute is: creatinine level is <20 mg/dL **and** the specific gravity is <1.003. *Extremely* low creatinine values in association with either a low or relatively high specific gravity may indicate that the donor has substituted the urine with another aqueous solution. The substituted liquid could either be a saline solution or pure water. By definition a specimen is considered to be substituted when the creatinine is <2.0 mg/dL and the specific gravity is < or = 1.0010 or >1.020.

What about ng THC/mg creatinine?
Since THC levels are heavily influenced by fluid intake, a calculated value (ng THC/ mg Creatinine) will appear on your reports. This value is the "normalized" THC, which has been adjusted to compensate for the variations in value due solely to fluid intake. This gives you a more useable number for comparing serial collections**.**