

Let's Talk Tox

Hormone Edition

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What is the normal concentration of a certain drug/metabolite?

INSIDE THIS ISSUE

- 1 Interpreting Toxicology Levels
- 2 Evaluating Hormone Levels
- 3 Comparing Hormone Levels in Blood, Saliva, and Urine
- 4 Example Reports
- 5 Why We Test Urine Hormones

As scientists, we take into consideration the age of the patient, creatinine level, urine concentration, and urine pH when we interpret a patient's results. These can be used as a correction factor to determine if a concentration of a given drug in the urine is too high or too low. For example, a high creatinine level indicates that the urine is very concentrated resulting in higher than average levels. Low creatinine levels indicate more dilute urine resulting in lower than average levels to be detected. Your sales representative or toxicologist will have a general idea of whether or not a drug concentration is too high or too low by considering the norm, and then applying the results from these variables to put their best guess forward as to whether the patient is taking too much of a given medication or not metabolizing it properly. As our report comments are continuously improved, they often say refer to toxicologist for levels that are outside of certain standards are norms we have already applied.

In general, many medications including but not limited to opiates and other drugs, cause a patient's metabolism to either slow down or speed up, dramatically affecting urine concentration levels of those drugs and their metabolites. For example, patients taking high doses of opiate-based medications for an extended period of time tend to have a very slow metabolism. Chronic opiate use tends to result in higher concentrations of these drugs in urine with longer detection windows because their entire system slows down. Those patients over extended periods of time also tend to develop liver damage which further results in slower metabolism of many medications. Additionally, certain antidepressants, SSRIs, and many other medications can affect how much of some metabolites or parent drugs shows up in the patient's urine. By weighing these variables, we can determine if a drug level in urine is of concern or warrants further testing and evaluation. ***It is also not uncommon to see very little to no free testosterone or other hormones in patients on opiates for extended periods of time.***

“Chronic opiate use tends to result in higher concentrations of these drugs in urine with longer detection windows”

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Evaluating Hormone Levels in urine

There are several factors to consider when evaluating hormone levels in urine:

- Age
- Metabolism
- Medication dosages
- Medical Diagnosis
- Factors such as Gastric Bypass surgery, kidney failure, dialysis, liver failure, Diabetes, Crohn's Disease

See Examples on Page 3

Comparing hormone testing in blood, urine, and saliva:

1. **Hormone testing with Serum/Blood** is the most common testing used and is considered the "tried and true" way to evaluate hormone levels. It can test both free (active) and total levels of testosterone and it is readily accessible most of the time. Blood can also be used to evaluate levels of sex hormone binding globulin (SHBG). SHBG is important for maintaining reservoirs of sex hormones and protects them from being excreted or metabolized too quickly. One of the key problems with blood is that it is INVASIVE. Who likes to get poked?? Also, there is always the risk of infection. Urine is not invasive and is easy to obtain.
2. **Saliva testing** is easy, doesn't require a blood draw, and looks at free hormone levels. It also can test for the hormone estriol and provides information about the peaks and troughs of a person's hormone levels because saliva testing allows for charting changes in hormones over time (such as a monthly menstrual cycle) with multiple samples. The limitations of saliva testing are accuracy and contamination. With all laboratory tests, a larger volume of any substance will result in greater accuracy in results. Hormones are found in much lower concentrations in saliva than in blood or urine which makes it much harder for labs to consistently report salivary hormones. Hormone levels in saliva may also seem artificially high when contaminated by bleeding gums or aggressive tooth brushing. Salivary pH and flow rate can also affect results. In the past, saliva testing has been discounted because of difficulty in reproducing the results and the variability of results between different labs.
3. **Urine testing** is limited to free hormone secreted in the urine; however it is a valuable method to utilize before moving forward with blood or saliva. Urine tests are easy to collect, less stressful for the patient, and can easily be followed up with an additional urine screen to provide additional data points. 24-hour urine profiles consisting of multiple samples collected through the day are the best way to get a good picture of the average hormone levels for a patient; however, a single collection can also be very useful as a snapshot. Since more hormones and hormone metabolites can be tested in urine than any blood or saliva panel, we can obtain additional information that is especially helpful in difficult cases.

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Sample Reports and Interpretations:

1. The first report is a sample report showing a male, **John Doe**, over 50 on Norco. This report shows zero testosterone and zero epi testosterone, normal cortisol and cortisone levels, normal validity and creatinine level, and all other parameters within the normal ranges. This is a common and standard example which shows male patients in particular, that are on opiates for extended periods of time. They have little to zero testosterone or epi testosterone in their urine. Since we test for free hormone levels in urine, the results will be lower than what we would see in blood; however, when compared to blood serum levels for testosterone and epi-testosterone, those low numbers will correlate. These patients often complain lack of energy, low sex drive and the need for additional pain medication when in reality, hormone replacement or supplementation often increases their energy level and reduces their need for additional pain medication, ultimately improving their overall health. This is particularly important with addicts in the recovery process.
2. The second report, **James Bond**, shows low cortisol and low cortisone in a male patient above 50 years of age on pain medication. The patient is taking Gabapentin which can directly affect cortisol and cortisone levels. Lunesta and Ambien can also negatively impact Cortisol and Cortisone levels.
3. The third example, **Billy Jackson**, demonstrates how Adderall can directly result in an elevated level of both Cortisol and Cortisone which is common amongst patients taking attention deficit disorder drugs or patients who consume extremely large amounts of caffeine.
4. The fourth example, **Jane Doe**, shows a female patient who is over 50 year of age and utilizes estrone. It is common to see female patients on opiate medications showing signs of menopause, or women who have passed through menopause with zero or very low estrone levels because they are no longer producing hormones. This results in hot flashes, mood swings, and overall health issues. Opiates and many other prescription medications tend to accelerate those effects.

See Sample Reports Attached

Why Do We Test Urine Hormones?

Physicians Toxicology has added urine hormone testing in conjunction with toxicology testing because chronic use of many medications can adversely affect hormone levels. Testing hormones can be very beneficial to identify and assess the possible effects of long term medication use. We offer a detailed result report with a board-certified Toxicologist review.

Urine is a low cost, non-invasive way to get very useful information without the need of a Phlebotomist, and can help make the decision to move forward with additional testing if necessary.

***For questions on your toxicology or hormone report
call 800-633-1850, extension 4***

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