

# Champlain Toxicology Lab

## Specimen Validity Testing

Validity testing is performed on all incoming samples. Its primary function is to detect urine adulteration that may render a sample invalid for testing. However, this testing can also point to medical and physiological conditions that should be investigated.

### Specimen Validity Assays

- Creatinine
- Specific Gravity
- pH
- Oxidants

**Creatinine** is naturally found in urine, typically in a concentration between 20 and 400 mg/dL. In drug testing, low creatinine is often indicative of sample dilution which is a manner of adulteration making it more difficult to detect drugs. This may be done by excessive fluid intake (“waterloading”) or by “scooping” water from a toilet or sink while giving the urine specimen. For this reason, Champlain Toxicology recommends the use of bluing in all toilets and having the water turned off in any accessible sinks during unobserved sample collection.

Low creatinine can also be a symptom of malnutrition, muscle disease and liver disease. Low creatinine is more common in older adults, as their lower muscle mass produces less creatinine. High creatinine values in urine can indicate dehydration, kidney damage and kidney failure.

**pH** measures the acidity or alkalinity of a sample. Normal values are between 4.5 and 9. Samples with pH values <3 or > 11 suggest that something has been added to the urine. These samples cannot be reliably screened as the EIA kits are not accurate at these levels and the sample must be rendered invalid. While confirmation testing can still be performed, drugs may have degraded due to the extreme pH environment.

**Specific Gravity** measures the concentration of dissolved particles in the sample. Abnormal values could indicate sample dilution, renal failure or renal dysfunction.

**Oxidant** positive samples usually point toward additives being placed into the sample to either decrease drug levels or eliminate drugs entirely. Depending on the oxidant used and the specific drugs in the urine, the oxidant may either mask the drugs’ presence by chemically altering it or destroy the drug entirely. Bleach, hydrogen peroxide or preparations commercially available online are common oxidants used to adulterate samples.