Urine Drug Testing — Common Laboratory Methodologies

**General Principles:**
- Unexpected results may be caused by preanalytical errors (e.g., mislabeling) or by sample adulteration, including substitution of synthetic or another individual’s urine.
- Results cannot help clinicians differentiate prescribed substance use from addictive use.
- The lab — depending on how the test results are to be used clinically — determines the concentration cutoff above which the test for the compound should be reported (drug present in the urine but at a concentration below the reporting cutoff).
- However, lower cutoffs may also lead to more false positives due to environmental sources.
- Presence of adulterants or parent drug without metabolites is more useful for detection of overdose than to confirm use of a drug.

**Key questions to ask when interpreting results:**
1. Are the results of the presumptive testing (i.e., immunoassays) consistent with the prescribed medications?
2. Are the metabolites consistent with ingestion of the prescribed medication?
3. Are there drugs or metabolites present that were not prescribed (illicit drugs or nonprescribed medications)?
4. Should I request definitive testing by GC/MS or LC-MS/MS (if the initial test was performed with an immunoassay)?

**Urine Drug Testing — Clinical Considerations:**

**Choosing the Laboratory Methodology**
- Clinicians can order urine drug testing with one of two main methodologies: Immunoassay or combination chromatographic/spectrometric techniques (gas chromatography/mass spectrometry method such as GC/MS or LC/MS-MS).
- Methods with lower sensitivity and specificity are typically used for initial screening or presumptive testing, whereas methods with higher sensitivity and specificity are used for confirmatory or definitive testing.

**Common Laboratory Methodologies**

<table>
<thead>
<tr>
<th>Laboratory Method</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Accuracy</th>
<th>Quick turn around</th>
<th>省略率</th>
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</thead>
<tbody>
<tr>
<td>Immunoassay</td>
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<td>Combination</td>
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<td>99%</td>
<td>98%</td>
<td>No</td>
<td>96%</td>
<td>96%</td>
<td>96%</td>
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</tr>
</tbody>
</table>

**Typically only provides results for a small number of compounds**

**Broadly available**

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**Results cannot help clinicians differentiate prescribed substance use from addictive use.**

**Risk of false-negative results because cutoffs are typically set high; the test typically only provides results for a small number of compounds.**

**Absence of metabolites would suggest the parent compound was added directly to the voided urine sample.**

**Ratios of parent drugs to metabolite(s) may be useful in assessing adherence.**

**Interpretation of quantitative results:**
- The dynamic variables involved in parent-drug and metabolite excretion (e.g., urine pH, state of drug preparation).
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**References:**
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