

URINE BENZODIAZEPINE

The EMIT II Plus Benzodiazepine Assay detects benzodiazepine and benzodiazepine metabolites in human urine.

Specificity

The table below lists concentrations of compounds that produce a result approximately equivalent to the 200 ng/mL and 300 ng/mL calibrator/control cutoffs, respectively. Each concentration represents the reactivity level for the stated compound when it is added to a negative urine specimen. These concentrations are within the range of the levels found in urine following use of the drug or, in the case of metabolites, the parent compound. If a specimen contains more than one compound detected by the assay, lower concentrations than those listed below may combine to produce a rate approximately equivalent to or greater than that of the cutoff calibrator.

| Compound | Conc. At 200 ng/mL cutoff | Conc. At 300 ng/mL cutoff |
|---|---------------------------|---------------------------|
| Alprazolam | 65 | 79 |
| 7-aminoclonazepam | 2600 | 8600 |
| 7-aminoflunitrazepam | 590 | 1400 |
| Bromazepam | 630 | 1400 |
| Chlordiazepoxide | 3300 | 7800 |
| Clobazam | 260 | 800 |
| Clonazepam | 580 | 1100 |
| Clorazepate | * | * |
| Clobazepam | 380 | 670 |
| Demoxepam | 1600 | 4000 |
| Estrazolam | 90 | 110 |
| Flunitrazepam | 140 | 350 |
| Flurazepam | 190 | 250 |
| Halazepam | 110 | 160 |
| α -Hydroxyalprazolam | 100 | 150 |
| α -Hydroxyalprazolam glucuronide | 110 | 120 |
| 1-N-Hydroxyethylflurazepam | 150 | 150 |
| α -Hydroxytriazolam | 130 | 190 |
| Ketazolam | 100 | 140 |
| Lorazepam | 600 | 890 |
| Lorazepam glucuronide | >20000 | >20000 |
| Medazepam | 150 | 210 |
| Nitrazepam | 320 | 560 |
| Norclordiazepoxide | 2600 | 4900 |
| Oxazepam | 250 | 350 |
| Oxazepam glucuronide | >50000 | >50000 |
| Prazepam | 90 | 130 |
| Triazepam | 140 | 210 |
| Triazepam glucuronide | 6900 | 11000 |

*Clorazepate degrades rapidly in stomach acid to nordiazepam. Nordiazepam hydrxylates to oxazepam.

The table below lists the compounds that produce a negative result by the EMIT II Plus Benzodiazepine Assay. Specificity testing was performed at the 200 ng/mL cutoff which represents the greatest potential for cross-reactivity. Positive results for compounds structurally unrelated to benzodiazepine have not been observed.

| Compound | Conc. Tested (µg/mL) at the 200 ng/mL cutoff |
|--|---|
| Acetaminophen | 1000 µg/mL |
| α-Acetyl-N,N-dinormethadol (dinor LAAM) | 25 µg/mL |
| l-α-Acetylmethadol (LAAM) | 25 µg/mL |
| N-Acetylprocainamide (NAPA) | 400 µg/mL |
| Acetylsalicylic Acid | 1000 µg/mL |
| Amitriptyline | 1000 µg/mL |
| d-Amphetamine | 1000 µg/mL |
| Benzoylcegonine | 1000 µg/mL |
| Buprenorphine | 1000 µg/mL |
| Caffeine | 1000 µg/mL |
| Cimetidine | 1000 µg/mL |
| Clomipramine | 2.5 µg/mL |
| Clonidine | 1000 µg/mL |
| Codeine | 500 µg/mL |
| Cotinine | 100 µg/mL |
| Cyclobenzaprine | 1000 µg/mL |
| Desipramine | 800 µg/mL |
| Diphenhydramine | 1000 µg/mL |
| Doxepin | 1000 µg/mL |
| 2-Ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP) | 1000 µg/mL |
| Fluoxetine | 1000 µg/mL |
| Glutethimide | 500 µg/mL |
| Ibuprofen | 1000 µg/mL |
| Ketamine | 100 µg/mL |
| Ketorolac Tromethamine | 1000 µg/mL |
| LSD | 10 ng/mL |
| Meperidine | 1000 µg/mL |
| d-Methamphetamine | 35 µg/mL |
| Methaqualone | 1500 µg/mL |
| Morphine | 1000 µg/mL |
| Naproxen | 1000 µg/mL |
| Nortriptyline | 1000 µg/mL |
| Phencyclidine | 1000 µg/mL |
| Phenytoin | 1000 µg/mL |

| | |
|--------------------------------|------------|
| Promethazine | 1000 µg/mL |
| Propoxyphene | 1000 µg/mL |
| Ranitidine | 1000 µg/mL |
| Scopolamine | 500 µg/mL |
| Secobarbital | 1000 µg/mL |
| 11-nor- Δ^9 -THC-9-COOH | 100 µg/mL |
| Thioridazine | 100 µg/mL |
| Tramadol | 1000 µg/mL |
| Tyramine | 100 µg/mL |
| Zidovudine (AZT) | 2 mg/mL |
| Zolpidem | 100 µg/mL |

Limitations

- The glucuronide metabolite of α -Hydroxyalprazolam cross-reacts with this assay. Other glucuronide metabolites such as Lorazepam, Oxazepam, and Temazepam cross-react to a limited extent. The cross-reactivity of other glucuronide metabolites with this assay is not known.
- Therapeutic doses of oxaprozin (DAYPRO), a non-benzodiazepine, may produce positive results with this assay. A positive result taking oxaprozin should be interpreted with caution and confirmed by another method.

Sensitivity

The sensitivity level (minimum detectable limit) of the Emit II Plus Benzodiazepine Assay is 23 ng/mL. This level represents the lowest concentration of lorazepam that can be distinguished from 0 ng/mL with a confidence level of 95%.

CAMC laboratories use the 200 ng/mL cutoff for the benzodiazepine assay.

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