

95536.3933 Drug cross-reactivity sheet

Copy of version 2.0 (approved and current)

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Author Christina Pierre

Comments for version 2.0

updated to match package insert information

Approval and Periodic Review Signatures

Туре	Description	Date	Version	Performed By	Notes
Periodic review	Core Lab Manager	12/7/2023	2.0	Lisa Rossi	
Periodic review	Core Lab Manager	12/29/2022	2.0	Lisa Rossi	
Periodic review	Core Lab Manager	3/25/2022	2.0	Lisa Rossi	
Approval	Core Lab Manager	6/10/2021	2.0	Lisa Rossi	
Approval	Core Lab Manager	3/4/2021	1.0	Lisa Rossi	

Version History

Version	Status	Туре	Date Added	Date Effective	Date Retired
2.0	Approved and Current	Major revision	6/10/2021	6/10/2021	Indefinite
1.0	Retired	Initial version	3/4/2021	3/4/2021	6/10/2021

95536.39332.0 6/10/2021

PRINCIPLE / PURPOSE / POLICY:

To provide information to providers drugs detected by urine drug screening immunoassays performed in the LGH core laboratory, and those that have been documented to exhibit cross-reactivity with each assay.

SCOPE: This document details information on the drugs detected by the drug screening assays performed in the core lab. This information is reviewed and updated yearly, when changes are made to drug assays and when new drug assays are added to the test menu both individually and as part of the UTOXS and UTOXN test panels. A link to this document is also found in EPIC with both the process instructions for these tests and with the test results. Consequently, with each update, the document copies in EPIC must also be updated in collaboration with laboratory information system team support.

While this document describes the intended targets of each urine drug screening assay and substances that have been proven to cross-react with each assay it is not exhaustive. False positive results due to substances other than those listed are possible. Confirmatory testing of all positive results using mass-spectrometry based methods is considered best practice.

AMPHETAMINE¹:

This assay detects the following compounds when present at the concentrations listed. If a specimen contains more than one compound detected by the assay, lower concentrations than those listed may combine to produce a positive result:

- d-amphetamine- 1000 ng/mL
- d-methamphetamine- 1000 ng/mL

Compounds	1000 ng/mL Cutoff
4-Chloramphetamine	12.2
Benzphetamine*	1.0
Bupropion	2220
Chloroquine	4500
erythro-Dihydrobupropion	82
Donepezil	11.2
I-Ephedrine	3500
Fenfluramine	150
Isometheptene	56
Mephentermine	60
Methoxyphenamine	360
Nor-pseudoephedrine	170
Phenmetrazine	13.0
Phentermine	25.0
Phenylpropanolamine	2000
Propranolol	500
d,I-Pseudoephedrine	8300
Quinacrine	16500
Tranylcypromine	200
Tyramine	600

Compounds	1000 ng/mL Cutoff
d,I-4-Methylamphetamine	16500
d-Amphetamine	1000
d,I-Methamphetamine	2100
d,I-Amphetamine	2150
I-Methamphetamine	3650
I-Amphetamine	11500
1,3 Dimethylpentylamine*	14900
MDA	6500
MDMA	34300
MDEA	27200

*Benzphetamine metabolizes to amphetamine and methamphetamine

Note: Selegiline, a prescription medication used in the treatment of Parkinson's disease, metabolizes to lamphetamine and l-methamphetamine. Therefore, patients taking Selegiline may test positive by amphetamine assays.

BARBITURATE²:

This assay detects the following compounds when present at the concentrations listed. If a specimen contains more than one compound detected by the assay, lower concentrations than those listed may combine to produce a positive result:

• Secobarbital- 200 ng/mL

Compound	Concentration (ng/mL) at 200 ng/mL Cutoff
Allobarbital	345
Alphenal	284
Amobarbital	555
Aprobarbital	275
Barbital	1278
5-Ethyl-5-(4-hydroxyphenyl) barbituric acid	927
Butabarbital	274
Butalbital	304
Butobarbital	349
Cyclopentobarbital	304
Pentobarbital	252
Phenobarbital	1087-1631*
Talbutal	194
Thiopental	1109

*Observed Range

Ċŀ`*/&\[••Ë^z&@^@]![ç^â/æ}å/&`!|^}@WIIH@E/O-^&@^A@@`ABBOOGFÈ TITLE: DRUG CROSS-REACTIVITIES

BENZODIAZEPINE³:

This assay detects the following compounds when present at the concentrations listed. If a specimen contains more than one compound detected by the assay, lower concentrations than those listed may combine to produce a positive result:

• Diazepam- 200 ng/mL

Compound	Concentration (ng/mL) at 200 ng/mL Cutoff
Alprazolam	65
7-Aminoclonazepam	5300
7-Aminoflunitrazepam	930
Bromazepam	630
Chlordiazepoxide	3300
Clobazam	260
Clonazepam	210
Clorazepate	•
Clotiazepam	380
Demoxepam	1600
N-Desalkylflurazepam	130
N-Desmethyldiazepam	110
Diazepam	70
Estazolam	90
Flunitrazepam	140
Flurazepam	190
Halazepam	110
a-Hydroxyalprazolam	100
a-Hydroxyalprazolam glucuronide [†]	110
1-N-Hydroxyethlylflurazepam	150
a-Hydroxytriazolam	130
Ketazolam	100
Lorazepam	600
Lorazepam glucuronide [†]	>20000
Medazepam	150
Midazolam	130
Nitrazepam	78
Norchlordiazepoxide	4500
Oxazepam	250
Oxazepam glucuronide [†]	>30000
Phenazepam	90
Prazepam	90
Temazepam	140
Temazepam glucuronide [†]	>20000
Tetrazepam	70
Triazolam	130

*Chlorazepate degrades rapidly in stomach acid to nordiazepam. Nordiazepam hydroxylates to oxazepam.

Therapeutic doses of oxaprozin (DAYPRO), a non-benzodiazepine, may produce positive results with this assay. A positive result from an individual taking oxaprozin should be interpreted with caution and confirmed by another method

BUPRENORPHINE4:

This assay detects:

- Buprenorphine
- Buprenorphine metabolites

COCAINE⁵:

This assay detects:

• Benzoylecgonine (cocaine metabolite)

OXYCODONE8:

This assay detects:

- Oxycodone
- Oxymorphone

MARIJUANA⁹:

This assay detects:

• Delta-9-THC metabolites

METHADONE¹⁰:

This assay detects:

• Methadone

FENTANYL⁶:

This assay detects the following compounds when present at the concentrations listed. If a specimen contains more than one compound detected by the assay, lower concentrations than those listed may combine to produce a positive result:

• Fentanyl- 1ng/mL

Norfentanyl (Major Metabolite)

Compound	Concentration Approximately Equivalent to the Cutoff (ng/mL)	Percent Cross-reactivity (%)
Norfentanyl	15	7

Compound	Concentration Approximately Equivalent to the Cutoff (ng/mL)	Percent Cross-reactivity (%)
Acetyl fentanyl	1.1	90.91
Isobutyryl fentanyl	1.1	90.91
ω-1-Hydroxyfentanyl	1.2	83.33
Acrylfentanyl	1.3	76.92
Butyryl fentanyl	1.4	71.43
Furanyl fentanyl	1.5	66.67
Para-fluoro fentanyl	1.5	66.67
Ocfentanil	1.6	62.50
4-Fluoro-isobutyryl fentanyl	1.9	52.63
Para-fluorobutyryl fentanyl (p-FBF)	1.9	52.63
Valeryl fentanyl	2.3	43.48
β-hydroxyfentanyl	9.5	10.53
Acetyl norfentanyl	12.1	8.26
(±) β-hydroxythiofentanyl	32.7	3.06
(±)-3-cis-methyl fentanyl	144.1	0.69
Carfentanil	448.2	0.22
Despropionyl fentanyl (4-ANPP)	471.8	0.21
Sufentanil	2,362	0.04
Norcarfentanil	2,418	0.04
Remifentanil	>10,000	<0.01
Alfentanil	>100,000	<0.001

Other Metabolites and Structural Analogs of Fentanyl

OPIATE⁷:

This assay detects the following compounds when present at the concentrations listed. If a specimen contains more than one compound detected by the assay, lower concentrations than those listed may combine to produce a positive result:

• Morphine- 300 ng/mL

Compound	Concentration (ng/mL) at the 300 ng/mL Cutoff
Codeine	102-306
Dihydrocodeine	291
Ethylmorphine	240
Hydrocodone	247
Hydromorphone	498
Levallorphan	3740*
Levorphanol	480
Meperidine	>15000†
6-Acetylmorphine	435
Morphine-3-Glucuronide	626
Nalorphine	2130*
Naloxone	360000
Oxycodone	3340
Oxymorphone	9300

* Therapeutic or toxic urinary levels of levallorphan and nalorphine are not reported in the literature.

[†] Meperidine urinary concentrations of 150000 ng/mL have been measured in cases of fatal meperidine overdosage.

Therapeutic doses of ofloxacin (Floxin) or levofloxacin (Levaquin), non-opiates, may produce positive results with this assay. A positive result from an individual taking ofloxacin or levofloxacin should be interpreted with caution and confirmed by another method.

REFERENCES:

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- 5.) Siemens Emit[®] II Plus Cocaine Metabolite Assay Instructions for Use. <u>https://doclib.siemens-healthineers.com/rest/v1/view?document-id=638135</u>. Accessed March 3rd, 2021.
- 6.) ARK[™] Fentanyl II Assay Instructions for Use. <u>https://ark-tdm.com/products/urine-drug-tests/fentanyl-II/pdfs/ARK_Fentanyl_II_Assay_Rev02_April_2020.pdf</u>. Accessed March 3rd, 2021.
- 7.) Siemens Emit[®] II Plus Opiate Assay Instructions for Use. <u>https://doclib.siemens-healthineers.com/rest/v1/view?document-id=638198</u>. Accessed March 3rd, 2021.
- 8.) Siemens Emit[®] II Plus Oxycodone Assay Instructions for Use. <u>https://doclib.siemens-healthineers.com/rest/v1/view?document-id=580698</u>. Accessed March 3rd, 2021.
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- 10.)Siemens Emit[®] II Plus Methadone Assay Instructions for Use. <u>https://doclib.siemens-healthineers.com/rest/v1/view?document-id=638169</u>. Accessed March 3rd, 2021.