



MEDICAL EXAMINER’S OFFICE
FORENSIC TOXICOLOGY LABORATORY
ONONDAGA COUNTY HEALTH DEPARTMENT
CENTER FOR FORENSIC SCIENCES

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Forensic Toxicology Scope of Testing and Detection Limits

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It is the Forensic Toxicology Laboratory’s responsibility to to determine the appropriate test method(s) to be utilized for analysis.



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Qualitative analyses

Volatile Screen by GC/FID

Analyte	Reporting limit	Limit of detection
Acetone	10 mg%	2.5 mg%
Ethanol	0.01 g%	0.0025 g%
Isopropanol	10 mg%	2.5 mg%
Methanol	10 mg%	2.5 mg%

Carbon Monoxide by Microdiffusion

Analyte	Approximate Limit of Detection
Carbon monoxide	15% carboxyhemoglobin

Carbon Monoxide by CO-Oximeter

Analyte	Reporting limit
Carbon monoxide	10% carboxyhemoglobin

Ethylene Glycol by GC/MS

Analyte	Reporting limit
Ethylene glycol	50 mg/L (5 mg%)

ELISA Buprenorphine by IA for Blood/Urine

Analyte/Class	Calibrant	Cut-Off Concentration (ng/mL)	Detects
Buprenorphine/metabolite	buprenorphine	1	buprenorphine, norbuprenorphine



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ELISA by IA for Blood

Analyte/Class	Calibrant	Blood Cut-Off Concentration (ng/mL)	Detects
Amphetamines Class	amphetamine	10	amphetamine, methylenedioxyamphetamine (MDA), para-methoxyamphetamine
Barbiturates	secobarbital	100	allobarbital, aprobarbital, butalbital, butabarbital, secobarbital, talbutal
Benzodiazepines	lorazepam	25	alprazolam, 7-aminoclonazepam, bromazepam, chlordiazepoxide, clobazam, clonazepam, clorazepate, N-desalkylflurazepam, N-desmethylflunitrazepam, diazepam, estazolam, etizolam, flubromazepam, flubromazolam, flurazepam, flunitrazepam, alpha-hydroxyalprazolam, 2-hydroxyethylflurazepam, hydroxyl-triazolam, lorazepam, lormetazepam, medazepam, midazolam, nimetazepam, nitrazepam, nordiazepam, oxazepam, prazepam, temazepam, triazepam
Cannabinoids	delta-9 carboxy-THC	10	delta-9 carboxy-THC
Cocaine/metabolite	benzoylecgonine	25	benzoylecgonine, cocaethylene, cocaine, hydroxybenzoylecgonine
Fentanyl	fentanyl	1	fentanyl, acetylfentanyl, acrylfentanyl, butyryl fentanyl, fluoroisobutyryl fentanyl, furanyl fentanyl, isobutyryl fentanyl, para/ortho/meta-fluorobutyryl fentanyl, ortho/meta-fluorofentanyl, methoxyacetyl fentanyl, 4-methoxy-butyryl fentanyl, para-chloroisobutyryl fentanyl, valeryl fentanyl
Methadone	methadone	25	methadone
Methamphetamine	methamphetamine	10	methamphetamine, methylenedioxymethamphetamine (MDMA), 3,4-methylenedioxy-N-ethylamphetamine (MDEA)
Opiates	morphine	10	6-acetylmorphine, codeine, hydrocodone, hydromorphone, morphine, morphine 3-glucuronide
Oxycodone/oxymorphone	oxycodone	12.5	oxycodone, oxymorphone
Phencyclidine	phencyclidine	5	phencyclidine

Note: Dextromethorphan/metabolites may exhibit cross-reactivity for the ELISA PCP immunoassay.



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ELISA by IA for Urine

DRUG/CLASS	Calibrant	Urine Cut-Off Concentration (ng/mL)	Detects
Amphetamines Class	amphetamine	500	amphetamine, methylenedioxyamphetamine (MDA), para-methoxyamphetamine
Barbiturates	secobarbital	200	allobarbital, aprobarbital, secobarbital, talbutal
Benzodiazepines	lorazepam	250	alprazolam, 7-aminoclonazepam, bromazepam, clobazam, clonazepam, clorazepate, N-desalkylflurazepam, N-desmethylflunitrazepam, diazepam, estazolam, etizolam, flubromazepam, flubromazolam, flurazepam, flunitrazepam, alpha-hydroxyalprazolam, 2-hydroxyethylflurazepam, hydroxyl-triazolam, lorazepam, lormetazepam, medazepam, midazolam, nimetazepam, nitrazepam, nordiazepam, oxazepam, prazepam, temazepam, triazepam
Cannabinoids	delta-9 carboxy-THC	50	delta-9 carboxy-THC
Cocaine/metabolite	benzoylecgonine	150	cocaine, benzoylecgonine, cocaethylene, hydroxybenzoylecgonine
Fentanyl	fentanyl	1	fentanyl, acetylfentanyl, acrylfentanyl, butyryl fentanyl, fluoroisobutyryl fentanyl, furanyl fentanyl, isobutyryl fentanyl, para/ortho/meta-fluorobutyryl fentanyl, ortho/meta-fluorofentanyl methoxyacetyl fentanyl, 4-methoxy-butyryl fentanyl, para-chloroisobutyryl fentanyl, valeryl fentanyl
Methadone	methadone	300	methadone
Methamphetamine	methamphetamine	500	methamphetamine, methylenedioxymethamphetamine (MDMA), 3,4-methylenedioxy-N-ethylamphetamine (MDEA)
Opiates	morphine	300	6-acetylmorphine, 6-acetylcodeine, codeine, desomorphine, dihydrocodeine, ethylmorphine, hydrocodone, hydromorphone, morphine, morphine 3-glucuronide
Oxycodone	oxycodone	300	oxycodone, oxymorphone
Phencyclidine	phencyclidine	25	phencyclidine

Note: Dextromethorphan/metabolites may exhibit cross-reactivity for the ELISA PCP immunoassay.



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Gamma Hydroxybutyrate (GHB) by GC/MS

Analyte	Reporting limit in postmortem urine	Reporting limit in ante-mortem urine
Gamma hydroxybutyrate (GHB)	50 mg/L	10 mg/L

Gabapentin, Pregabalin by GC/MS

Analyte	Reporting limit in Blood
Gabapentin	0.5 ug/mL
Pregabalin	0.5 ug/mL



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Alkaline Drug Screen by GC/MS

Analyte	Approximate Detectable Concentration (ng/mL)*	Analyte	Approximate Detectable Concentration (ng/mL)*
Amantadine	not determined	Meperidine	not determined
Amitriptyline	10	Methadone	10
Amoxapine	not determined	Metoclopramide	not determined
Atropine	not determined	Mirtazapine	50
Benztropine	not determined	Norquetiapine	250
Brompheniramine	not determined	Norsertraline	50
Bupivacaine	not determined	Nortriptyline	50
Bupropion	10	O-desmethyltramadol	100
Chlorpheniramine	25	O-desmethylvenlafaxine	50
Chlorpromazine	25	Orphenadrine	not determined
Citalopram/escitalopram**	10	Paroxetine	50
Clomipramine	10	Pentazocine	50
Clozapine	not determined	Propoxyphene	25
Cyclobenzaprine	10	Pseudoephedrine/ephedrine	100
Desipramine	25	Quinine/quinidine**	not determined
Desmethylcitalopram	50	Sertaline	25
Dextromethorphan	10	Strychnine	14
Diphenhydramine	10	Thioridazine	25
Doxepin	25	Tramadol	50
Doxylamine	10	Trazodone	50
Duloxetine	150	Trimipramine	not determined
Etomidate	not determined	Venlafaxine	50
Fluoxetine	not detected at 100 ng/mL	Verapamil	25
Imipramine	10	Zolpidem	25
Ketamine	10		
Lidocaine	not determined		
Loxapine	not determined		

*Due to the nature of certain specimens (e.g., decompositional fluid, spleen, and liver), detectable concentrations may be elevated.

**This laboratory cannot differentiate between stereoisomers.

Alkaline drug screening for gastric contents is conducted on a 1:25 dilution.



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Alkaline Drug Screen by GC/MS Continued

“Substituted cathinone”

Detectable Analytes
Butylone
Dibutylone
Ethcathinone
Ethylone
Eutylone
Mephedrone
Methylenedioxypropylone (MDPV)
4-methylethcathinone
Methylone
N-ethylpentylone
N, N-dimethylpentylone
Pentylone
2-pyrrolidinovalerone (alpha-PVP)

Fentanyl analogs

Detectable Analytes
Acetyl fentanyl
4-ANPP (despropionyl fentanyl)
4-methoxybutyryl fentanyl
Acryl fentanyl
Butyryl fentanyl
Crotonyl fentanyl
Cyclopropyl fentanyl
Fluorobutyryl fentanyl
Fluoro fentanyl
Furanyl fentanyl
Methoxyacetyl fentanyl
Tetrahydrofuran fentanyl
Valeryl fentanyl

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Acid Neutral Drug Screen by GCMS

Analyte	Approximate Detectable Concentration (ug/mL)*
acetaminophen	0.5
butalbital	0.05
caffeine	not determined
carbamazepine	0.25
carisoprodol	0.25
celecoxib	not determined
ibuprofen	2
lamotrigine	0.25
levetiracetam	0.25
meprobamate	0.25
metaxalone	not determined
naproxen	1
phenobarbital	0.25
phenytoin	0.25
primidone	not determined
theophylline	not determined
topiramate	0.25
trimethoprim	not determined
valproic acid	25
warfarin	not determined
zonisamide	not determined

*Due to the nature of certain specimens (e.g., decompositional fluid, spleen, and liver), detectable concentrations may be elevated.

Acid neutral screening for gastric contents is conducted on a 1:25 dilution.

Salicylates by CT

Analyte	Limit of Detection
Salicylates	100 ug/mL



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Quantitation/Confirmation

Volatiles by HS GC/FID

Analyte	Reporting limit	Limit of detection
Acetone	10 mg%	2.5 mg%
Ethanol	0.01 g%	0.005 g%
Isopropanol	10 mg%	2.5 mg%
Methanol	10 mg%	10 mg%

Only analytes listed on the report underwent analysis for volatiles by HS GC/FID.

Carbon Monoxide by UV/Vis

Analyte	Reporting limit
Carbon monoxide	10% carboxyhemoglobin

Alkaline Drugs by GC/MS

Analyte	Reporting limit in blood	Reporting limit in liver
Diphenhydramine	5 ng/mL	50 ng/g
Fentanyl	0.125 ng/mL	5 ng/g
Ketamine	5 ng/mL	50 ng/g
Methadone	5 ng/mL	50 ng/g

Only analytes listed on the report underwent alkaline drug quantitation by GC/MS.

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Alkaline Drugs by LC/MS/MS

Analyte	Reporting limit in blood	Reporting limit in liver
Amitriptyline	5 ng/mL	50 ng/g
Nortriptyline	5 ng/mL	50 ng/g
Citalopram/escitalopram**	5 ng/mL	50 ng/g
Desmethylcitalopram	5 ng/mL	50 ng/g
Cyclobenzaprine	5 ng/mL	50 ng/g
Fluoxetine	5 ng/mL	50 ng/g
Norfluoxetine	10 ng/mL	50 ng/g
Mirtazapine	5 ng/mL	50 ng/g
Paroxetine	5 ng/mL	50 ng/g
Sertraline	5 ng/mL	50 ng/g
Norsertaline	10 ng/mL	NA
Tramadol	5 ng/mL	50 ng/g
O-desmethyltramadol	5 ng/mL	50 ng/g
Venlafaxine	5 ng/mL	50 ng/g
O-desmethylvenlafaxine	5 ng/mL	50 ng/g
Zolpidem	5 ng/mL	50 ng/g

Only analytes listed on the report underwent alkaline drug quantitation by LC/MS/MS.

** This laboratory cannot differentiate between stereoisomers.

Acid Neutral Drugs by GC/MS

Analyte	Reporting limit in blood	Reporting limit in liver
Butalbital	0.1 ug/mL	0.2 ug/g
Carbamazepine	1 ug/mL	2 ug/g
Carisoprodol	1 ug/mL	2 ug/g
Meprobamate	1 ug/mL	2 ug/g
Phenobarbital	1 ug/mL	2 ug/g
*Phenytoin	1 ug/mL	2 ug/g

Only analytes listed on the report underwent acid neutral drug quantitation by GC/MS.

*Phenytoin quantitation is currently suspended.



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Cocaine/metabolites by GC/MS

Analyte	Reporting limit for blood	Reporting limit for urine^	Reporting limit for liver
Cocaine	10 ng/mL	50 ng/mL	50 ng/g
Benzoylcegonine	10 ng/mL	50 ng/mL	50 ng/g
Cocaethylene	10 ng/mL	50 ng/mL	50 ng/g

^Report urine qualitatively only.

Cannabinoids by LC/MS/MS

Analyte	Reporting limit in blood
Delta-9 THC	0.5 ng/mL
11-Hydroxy Delta-9 THC	1 ng/mL
Delta-9 Carboxy THC	2.5 ng/mL

Benzodiazepines by LC/MS/MS

Analyte	Reporting limit in Blood
7-aminoclonazepam	5 ng/mL
Alpha-hydroxyalprazolam	5 ng/mL
Alprazolam	5 ng/mL
Chlordiazepoxide	10 ng/mL
Clonazepam	5 ng/mL
Diazepam	10 ng/mL
Estazolam	10 ng/mL
Etizolam	5 ng/mL
Lorazepam	5 ng/mL
Midazolam	10 ng/mL
Nordiazepam	10 ng/mL
Oxazepam	10 ng/mL
Temazepam	10 ng/mL
Triazolam	10 ng/mL
Zaleplon	5 ng/mL



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Opiates by GC/MS

Analyte	Reporting limit in blood, vitreous	Reporting limit in Urine [^]	Reporting limit in liver
Codeine	10 ng/mL	25 ng/mL	50 ng/g
Morphine	10 ng/mL	25 ng/mL	50 ng/g
Hydrocodone	5 ng/mL	25 ng/mL	50 ng/g
Hydromorphone	2.5 ng/mL	25 ng/mL	50 ng/g
6-acetylmorphine	2.5 ng/mL	2.5 ng/mL	50 ng/g

[^]Report urine qualitatively only.

Methadone by GC/MS

Analyte	Reporting limit in blood, vitreous	Reporting limit in Urine [^]	Reporting limit in liver
Methadone*	5 ng/mL	25 ng/mL	50 ng/g

[^]Report urine qualitatively only.

6-acetylmorphine by GC/MS

Analyte	Reporting limit in blood, vitreous	Reporting limit in urine [^]	Reporting limit in liver
6-acetylmorphine	2.5 ng/mL	2.5 ng/mL	50 ng/g

[^]Report urine qualitatively only.

Oxycodone, Oxymorphone by GC/MS

Analyte	Reporting limit in blood, vitreous	Reporting limit in urine [^]	Reporting limit in liver
Oxycodone	5 ng/mL	25 ng/mL	50 ng/g
Oxymorphone	2.5 ng/mL	25 ng/mL	50 ng/g

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Amphetamines by GC/MS

Analyte	Reporting limit for blood	Report limit for urine [^]	Report limit for liver
Amphetamine	10 ng/mL	50 ng/mL	50 ng/g
Ephedrine	10 ng/mL	50 ng/mL	50 ng/g
Methamphetamine	10 ng/mL	50 ng/mL	50 ng/g
Methylenedioxyamphetamine(MDA)	10 ng/mL	50 ng/mL	50 ng/g
Methylenedioxymethamphetamine (MDMA)	20 ng/mL	50 ng/mL	50 ng/g
Phentermine ^{^^}	20 ng/mL	50 ng/mL	50 ng/g
Phenylpropanolamine	10 ng/mL	50 ng/mL	50 ng/g
Pseudoephedrine	10 ng/mL	50 ng/mL	50 ng/g

This laboratory cannot differentiate between stereoisomers.

Note: Ephedrine's report limit is raised to 100 ng/mL for blood, 200ng/mL for urine, or 200 ng/g for liver when pseudoephedrine is also positive.

[^]Report urine qualitatively only.

^{^^}Report phentermine qualitatively only.

Phencyclidine (PCP) by GC/MS

Analyte	Reporting limit in blood
Phencyclidine (PCP)	0.5 ng/mL