



## KBI FORENSIC LABORATORY TOXICOLOGY DIRECTORY OF SERVICES

January 23, 2001

The goal of the Toxicology Section of the Kansas Bureau of Investigation Forensic Laboratory is to provide Kansas law enforcement agencies and medical examiners with accurate and timely testing of human biological materials. This goal is accomplished by KBI Forensic Toxicologists using the most advanced techniques and instrumentation available to the laboratory. Examinations are available for a wide variety of volatile and drug compounds. This directory has been produced to assist authorized agencies to determine how the KBI Toxicology Laboratory can best serve their investigations.

The primary role of the Toxicologist is to analyze specimen(s) using proven, reliable methods, to report those findings to the submitting agency, and to present his/her findings, if necessary, in court.

Trends in use of alcohol and abused or prescriptions drugs, and changes in KBI resources may occasionally alter the availability of toxicology services. Examinations may be added or deleted as these trends and resources evolve. This directory will be updated periodically to reflect changes in toxicology services.

The laboratory is nationally accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board.

### General Information

#### Types of Toxicology Examinations

Examinations are grouped into 3 general categories:

1. Blood Alcohol Testing
2. Urine Drug Testing
3. Blood Drug Testing (Alternative specimens are accepted)

Examinations not available are:

1. Antibiotics
2. Clinical chemistries
3. Lithium
4. Microbiological testing, including Human Immunodeficiency Virus (HIV)
5. Steroids
6. Animal testing
7. Employee drug testing
8. Probation monitoring

If blood or urine are not available or suitable, examinations can be performed on other body fluids and tissues such as vitreous humor, bile, gastric contents, liver, kidney, and brain (see individual examinations).

The drug examinations are generally multi-drug procedures. They have been developed and verified to cover the widest possible screen. However, some important compounds are not detectable by these procedures. It

**This directory supersedes all previous directories and listings.**

Gretchen performed  
a General Urine Drug  
Screen (starts bottom  
of page 5), cyanide  
metals screens, and some  
specific tests for drugs  
that you asked for.

Jamy

## **KBI Toxicology Directory of Services (continued)**

**is important that suspected drugs/case histories be noted on the evidence custody form so that the most sensitive procedures are utilized.**

When deciding what types of specimens to submit, keep in mind that many drugs of abuse, such as Amphetamines, Cannabinoids and Opiates, can be very difficult to detect in blood. Especially in driving-under-the-influence cases, where a law enforcement officer has observed a subject's behavior, urine may be the better choice for examination. This laboratory will never quantitate drugs in urine, since a urine drug level cannot be used to determine a blood level or influence on the subject. However, when used to complement an officer's observations, urine drug testing is of great value.

In cases where it may be critical to determine the concentration of drugs in the body, blood is required. Even in these cases, interpretation of blood levels for many drugs is difficult, if not impossible, and therefore of limited value.

### **Storage, Condition and Packing of Specimens**

KBI Blood Alcohol Kits are available upon request. Please call 785-296-8311/8313 to order kits. Be sure that the vacutainer tube is not expired. Seal the tube, the ziploc bag and the mailing envelope with tamper-resistant tape. Write your initials and date on each seal.

For larger amounts of evidence, seal all specimen containers to prevent leakage or accidental spills. Seal them in ziploc bags, heat-seal pouches or other sealable, leak-resistant packaging. Pack specimens securely in a protective container. Seal all specimen containers and each layer of packaging with tamper-resistant tape, and write your initials and date on each seal. Remember that a container is properly sealed if its contents cannot readily escape and only if entering the container results in obvious alteration to the container or its seal, and the seal is initialed and dated.

Please be sure that all tubes containing additives are well mixed before packaging. Properly identify all specimen containers with initials, time, date, subject's name, your case number and item number as listed on the Physical Evidence Custody Receipt.

Contributors should use the KBI Laboratory's Physical Evidence Custody Receipt. Submission of evidence using other forms slows the processing of cases at the KBI Laboratory. All requested information should be complete and legible. Attach the Physical Evidence Custody Receipt so that it can be accessed without breakage of the inner seal. This allows the examiner to receive evidence in a sealed condition just as it was packed by the sender. Address to Kansas Bureau of Investigation, ATTN: LABORATORY, 1620 SW Tyler, Topeka, Kansas 66612.

Refrigeration is required for all toxicology specimens. It is understood that refrigeration is not usually possible while specimens are in transit. Do not freeze specimens.

### **Submission of Evidence**

All toxicology samples should be mailed or hand-delivered to the TOPEKA Laboratory. Toxicology services are not available at the Great Bend or Pittsburg regional laboratories. Submitting toxicology evidence at these locations only slows examinations and reporting. Mail so that the evidence arrives during the work week (not the weekend) to prevent degeneration of biological samples.

### **Reporting**

Expected turn-around-times are listed with each examination below. Please allow sufficient time before calling for results. If faster results are required, indicate "RUSH" on the Evidence Custody Receipt, or call the KBI Toxicology Laboratory at 785-296-8320.

Preliminary results or case status may be obtained by calling the laboratory at 785-296-8320. Results will be provided only to authorized representatives of the submitting agency.

Final reports will be mailed to the submitting agency as soon as results are available.

## KBI Toxicology Directory of Services (continued)

QNS on reports indicates "quantity not sufficient" for analysis. Please submit the minimum quantity of specimen indicated below for the requested examination.

### Repeat Assays

The KBI Toxicology Laboratory emphasizes standardization, maintenance of instrumentation, quality control surveillance, and verification of test results. Repeat assays are not normally required. If a reported result is incompatible with a case history, contact the Toxicology Laboratory supervisor at 785-296-8319.

### Methodologies

#### Color Tests

MPEIA – Microplate Enzyme Immunoassay

GC/FID - Gas Chromatography/Flame Ionization Detection

GC/MS - Gas Chromatography/Mass Spectrometry

Headspace Gas Chromatography

HPLC/ECD - High-Performance Liquid Chromatography/Electrochemical Detection

HPLC/FL - High-Performance Liquid Chromatography/Fluorescence Detection

HPLC/PDA - High-Performance Liquid Chromatography/Photodiode Array

HPLC/VWD – High-Performance Liquid Chromatography/Variable Wavelength Ultraviolet Detection

MTLC - Modified Thin-Layer Chromatography

Paper Tests

RIA - Radioimmunoassay

## TOXICOLOGY EXAMINATIONS

### Routine Examinations

#### Blood Alcohol Test (BAT/Volatiles)

(also see Volatile Compounds under Special Request Examinations)

**Average Turn-Around-Time:** 5 days.

**Typical Case Types:** Assault/Battery, Death Investigations, DUI, Sexual Assault/Rape.

**Specimen Requirement:** 7-10 mL whole blood. Examination will not be performed on urine.

**Container:** KBI Blood Alcohol Kit preferred, gray-top tube (sodium fluoride or sodium fluoride/potassium oxalate).

**Methodology:** Headspace GC/FID.

**Examination Includes:**

#### Quantitative

Ethyl Alcohol

#### Qualitative (Quantitative on special request)

Acetone

Methyl Alcohol

Isopropyl Alcohol

#### Blood Drug Screen (Routine Drugs-of-Abuse)

**Average Turn-Around-Time:** 14 days.

**Typical Case Types:** DUI.

**KBI Toxicology Directory of Services (continued)**

**Special Instructions:** Requests must specify a complete examination or list suspected drugs (for example, a request for THC will be tested for Cannabinoids only).

**Specimen Requirement:** 10 mL whole blood or serum in gray-top tubes.

**Methodology:** Initial screening by MPEIA; confirmation of positives by GC/MS. Drugs confirmed in blood or serum may be quantitated if requested and sufficient specimen is available.

**Examination Includes:**

Methamphetamine  
Cannabinoids  
Cocaine Metabolite (Benzoylecgonine)  
Opiates  
Phencyclidine (PCP)

Other drugs or drug classes which the contributor may suspect, such as barbiturates, benzodiazepines or a specific drug or drugs listed in Blood Drug Screen (General) below must be specifically requested in DUI cases.

**Blood Drug Screen (General)**

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Death Investigations.

**Specimen Requirement:** 2-3 full gray-top tubes.

**Alternative Specimens Accepted:**

Vitreous Humor: 3-4 mL in a gray-top tube.

Bile: All.

Gastric: All.

Kidney: 50 grams.

Liver: 50 grams.

Brain: 50 grams.

**Container:** See Specimen Requirement.

**Methodology:** Initial screening by MPEIA and HPLC/PDA. Confirmation of positives by GC/MS.

**Examination Includes:**

**Antidepressants and Metabolites**

Amitriptyline	Fluoxetine	Nordoxepin
Amoxapine	Imipramine	Nortriptyline
Desipramine	Maprotiline	Trazodone

**Barbiturates**

Amobarbital	Butethal	Phenobarbital
Aprobarbital	Hexobarbital	Secobarbital
Butobarbital	Mephobarbital	Thiopental
Butalbital	Pentobarbital	

**Benzodiazepines and Metabolites**

Chlordiazepoxide	Norclordiazepoxide	Oxazepam
Diazepam	Nordiazepam	

**Central Nervous System Stimulants and Metabolites**

Benzoylecgonine	Ephedrine/Pseudoephedrine	Phenylpropanolamine
Caffeine	MDA	
Cocaine	MDMA	

## KBI Toxicology Directory of Services (continued)

### Narcotics and Metabolites

Codeine	Methadone	Oxycodone
Hydrocodone	Morphine	Propoxyphene
Meperidine	Norpropoxyphene	

### Phenothiazines

Chlorpromazine	Thioridazine	Triflupromazine
Mesoridazine	Thiothixene	
Promazine	Trifluoperazine	

### Other Drugs and Metabolites

Acetaminophen	Ketoprofen	Phensuximide
n-Acetylprocainamide	Lidocaine	Phenylbutazone
Atropine	Loxapine	Phenytoin
Benzphetamine	Mefenamic acid	Primidone
Carbamazepine	Mephenytoin	Procainamide
Carbamazepine-10,11-epoxide	Methocarbamol	Promethazine
Cotinine	Methohexital	Quinine/Quinidine
Dyphylline	Metoprolol	Salicylates
Emetine	Naproxen	Strychnine
Ethosuximide	Orphenadrine	Theophylline
Fencamfamine	Papaverine	Tolmetin
Fenoprofen	Phenacetin	Tripelennamine
Furosemide	Phencyclidine (PCP)	Verapamil
Glutethimide	Phendimetrazine	Warfarin
Guaifenesin	Phenelzine	Xylidine
Hydralazine	Phenethylamine	Yohimbine
Ibuprofen	Pheniramine	Zolpidem
Indomethacin	Phenmetrazine	

### Urine Drug Screen (Routine Drugs-of-Abuse)

**Average Turn-Around-Time:** 14 days.

**Typical Case Types:** DUI, Assault/Battery, Sexual Assault/Rape.

**Special Instructions:** Requests must specify a complete examination or list suspected drugs (for example, a request for THC will be tested for Cannabinoids only).

**Specimen Requirement:** 50 mL urine.

**Container:** Use plastic urine drug screen bottle and evidence tape or tamper-resistant container. Place in leak-proof packaging.

**Methodology:** Initial screening by MPEIA; confirmation of positives by GC/MS. Drugs confirmed in urine will not be quantitated.

**Examination Includes:**

- Methamphetamine
- Cannabinoids
- Cocaine Metabolite (Benzoylecgonine)
- Opiates
- Phencyclidine (PCP)

### Urine Drug Screen (General)

**Average Turn-Around-Time:** 21 days.

## KBI Toxicology Directory of Services (continued)

**Typical Case Types:** Death Investigations.

**Specimen Requirement:** 50 mL urine.

**Container:** Use plastic urine drug screen bottle and evidence tape or tamper-resistant container. Place in leak-proof packaging.

**Storage:** Refrigeration is recommended for short-term storage.

**Methodology:** Initial screening by MPEIA, Salicylate and Ethchlorvynol color tests, and MTLC; confirmation of positives by CG/MS or HPLC/PDA. For coroner's cases only, drugs confirmed in urine may be quantitated in blood if requested. Confirmed drugs will not be quantitated in urine.

**Examination Includes:**

### Amphetamines and Metabolites

Amphetamine	Methylenedioxymethamphetamine (MDMA)	Phenylpropanolamine
Ephedrine/Pseudoephedrine		
Methamphetamine	Phenmetrazine	
Methylenedioxyamphetamine (MDA)	Phentermine	

### Analgesics, Non-narcotic and Nonsteroidal Anti-inflammatory Drugs

Acetaminophen	Indomethacin	Salicylates
Fenoprofen	Naproxen	Sumatriptan
Ibuprofen	Phenacetin	Tramadol

### Antidepressants and Metabolites

Amitriptyline	Doxepin	Paroxetine
Amoxapine	Fluoxetine	Protriptyline
Bupropion	Imipramine	Sertraline
Citalopram	Maprotiline	Tranylcypromine
Clomipramine	Mirtazapine	Trazodone
Desipramine	Nefazodone	Trimipramine
	Nortriptyline	Venlafaxine

### Barbiturates

Amobarbital	Butalbital	Secobarbital
Aprobarbital	Pentobarbital	
Butobarbital	Phenobarbital	

### Benzodiazepines (Analyzed as Benzophenones) and Metabolites

Chlordiazepoxide	Lorazepam	Prazepam
Desalkylflurazepam	Norchlordiazepoxide	Temazepam
Diazepam	Nordiazepam	
Flurazepam	Oxazepam	

### Narcotics and Metabolites

Codeine	Meperidine	Oxycodone
Diacetylmorphine	Methadone	Oxymorphone
Dihydrocodeine	6-Monoacetylmorphine	Pentazocine
Ethylmorphine	Morphine	Propoxyphene
Hydrocodone	Morphine-3-glucuronide	
Hydromorphone	Norpropoxyphene	

## KBI Toxicology Directory of Services (continued)

### Phenothiazines and Metabolites

Chlorpromazine	Promazine	Thiothixene
Phenothiazine metabolites	Promethazine	Trifluoperazine
Prochlorperazine	Thioridazine	Triflupromazine

### Other Drugs and Metabolites

Atropine	Emetine	Olanzapine
Benzoylcegonine	Ethchorvynol	Orphenadrine
Benzotropine	Felbamate	Papaverine
Brompheniramine	Flecainide	Phencyclidine (PCP)
Buspirone	Gemfibrozil	Phenethylamine
Caffeine	Glutethimide	Pheniramine
Cannabinoids	Guaifenesin	Phenylbutazone
Carbamazepine	Labetalol	Phenytoin
Carisoprodol	Lidocaine	Procainamide
Chlorpheniramine	Loxapine	Propranolol
Cimetidine	Mefenamic Acid	Propylhexedrine
Clozapine	Haloperidol	Quetiapine
Cocaine	Meprobamate	Quinine/Quinidine
Cotinine (Nicotine metabolite)	Methapyrilene	Ranitidine
Dextromethorphan	Methaqualone	Strychnine
Diltiazem	Methocarbamol	Theophylline
Diphenhydramine	Methylphenidate	Tocainide
Disopyramide	Metoprolol	Triamterene
Doxylamine	Mexiletine	Trimethoprim
Ecgonine	Nicotine	Tripelennamine
Ecgonine Methyl Ester	Nizatidine	Verapamil

### Special Request Examinations

#### Carbon Monoxide, Blood

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Death Investigations.

**Specimen Requirement:** 7-10 mL EDTA whole blood, venous or arterial.

**Container:** Lavender-stopper (EDTA) tube. Keep frozen with as little airspace as possible.

**Methodology:** Spectrophotometry.

#### Cyanide, Urine

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Death Investigations.

**Specimen Requirement:** 20 mL urine.

**Container:** Plastic urine drug screen container. Keep frozen with as little airspace as possible.

**Methodology:** Color test.

#### Ethylene Glycol, Blood or Urine

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Death Investigations.

**Specimen Requirement:** 10 mL blood or urine, 5 mL gastric contents, or 5 g tissue.

**Container:** Grey stopper tube or plastic urine drug screen bottle.

**Methodology:** Initial screening by GC/FID; confirmation of positives by GC/MS.

**KBI Toxicology Directory of Services (continued)**

**Flunitrazepam (ROHYPNOL), Urine**

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Sexual assault.

**Specimen Requirement:** 50 mL urine.

**Container:** Grey stopper tube or plastic urine drug screen bottle, kept refrigerated and protected from light.

**Methodology:** Initial screening by MPEIA and/or HPLC/PDA; confirmation of positives by GC/MS.

**Gamma-Hydroxybutyric Acid (GHB), Blood or Urine**

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Sexual assault.

**Specimen Requirement:** 10 mL blood or 50 mL urine.

**Container:** Grey stopper tube or plastic urine drug screen bottle, kept refrigerated and protected from light.

**Methodology:** GC/MS.

**Inhalants, Blood**

**Average Turn-Around-Time:** 10 days.

**Typical Case Types:** DUI, Death Investigations

**Specimen Requirement:** 10 mL whole blood and/or 10 g tissue (brain, liver, heart, kidney).

**Container:** KBI Blood Alcohol Kit preferred, grey-top tube (sodium fluoride or sodium fluoride/potassium oxalate). Keep refrigerated with as little airspace as possible.

**Methodology:** Color Test, GC/FID, or GC/MS.

**Examination Includes:**

Benzene

Halogenated Hydrocarbons

Xylenes

Butane

Toluene

**Lysergic Acid Diethylamide (LSD), Blood or Urine**

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Assault/Battery, Death Investigations, DUI, Possession, Sexual Assault/Rape.

**Specimen Requirement:** 10 mL blood or 10 mL urine.

**Container:** Grey or red-stopper tube or plastic urine drug screen bottle.

**Methodology:** Initial screening by MPEIA; confirmation of positives by HPLC/FL.

**Metals, Urine, Gastric Content or Tissue**

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Death Investigations

**Specimen Requirement:** 5 mL urine or 10 g tissue (brain, liver, heart, kidney).

**Container:** Plastic urine drug screen bottle

**Methodology:** Reinsch Test (presumptive screen only).

**Examination Includes:**

Arsenic

Antimony

Bismuth

Mercury

## KBI Toxicology Directory of Services (continued)

### Salicylates, Blood

**Average Turn-Around-Time:** 30 days.

**Typical Case Types:** Death Investigations.

**Specimen Requirement:** 7-10 mL blood.

**Container:** Grey or red-stopper tube.

**Methodology:** Initial screening by HPLC/PDA; confirmation of positives by GC/MS.

**Examination Includes:**

Salicylic Acid

Salicyluric Acid

### Other Special Requests, All Specimen Types

Other examinations may be available on special request. These tests may be possible if the suspected drug is included in the KBI Toxicology Laboratory inventory.

Acebutolol

Albuterol

Alphaprodine

Astemizole

Baclofen

Bumetanide

Bufotenine

Chloral Hydrate

Chlorzoxazone

Clonidine

Chlorpyrifos

Cyclizine

Dantrolene

Disulfiram

Methsuximide

Midazolam

Nifedipine

Naloxone

Omeprazole

Paroxetine

Perphenazine

Prednisone

Pyrilamine

Spirolactone

Terfenadine

Theobromine

Triazolam

Trimethadione

Valproic Acid