



DEA TOX

DRUG ENFORCEMENT ADMINISTRATION
TOXICOLOGY TESTING PROGRAM

QUARTERLY REPORT

Fourth Quarter – 2022



**U.S. Department of Justice
Drug Enforcement Administration
Diversion Control Division
Drug and Chemical Evaluation Section**

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Introduction

The Drug Enforcement Administration’s Toxicology Testing Program (DEA TOX) began in May 2019 as a surveillance program aimed at detecting new psychoactive substances within the United States. In response to the ongoing synthetic drug epidemic, the Drug Enforcement Administration (DEA) awarded a contract with the University of California at San Francisco (UCSF) to analyze biological samples generated from overdose victims of synthetic drugs.

In many cases, it can be difficult to ascertain the specific substance responsible for the overdose. The goal of DEA TOX is to connect symptom causation to the abuse of newly emerging synthetic drugs (e.g. synthetic cannabinoids, synthetic cathinones, synthetic opioids, other hallucinogens, etc.).

DEA has reached out to local health departments, law enforcement partners, poison centers, drug court laboratories, hospitals, and other medical facilities to offer testing of leftover or previously collected samples for analysis of synthetic drugs. DEA TOX is interested in patients thought to have ingested a synthetic drug, where the traditional drug screen has produced little or no viable options to explain the symptoms exhibited by the patient (alcohol and THC are exempted). DEA TOX may approve leftover unused biological samples (or biological samples) or occasionally non-biological samples for testing from a medical facility or law enforcement partner only.

Once DEA TOX is contacted (DEATOX@DEA.GOV) and upon approval by DEA of the request for testing of specific samples, the originating laboratory is invited to send their samples to the Clinical Toxicology and Environmental Biomonitoring (CTEB) Laboratory at UCSF. DEA covers the full cost of analysis for each sample approved for testing. Using liquid chromatography quadrupole time-of-flight mass spectrometry, synthetic drugs identified within the samples are confirmed and quantified. Levels denoted in the tables below with a defined range represent the low and high concentrations reported when the frequency of detection is greater than one. The CTEB laboratory currently maintains a comprehensive drug library consisting of the following:

- 912 new psychoactive substances (**NPS**);
- 161 traditional illicit drugs (**TID**);
- 93 prescription or over-the-counter (**OTC**) drugs;
- 27 dietary supplement stimulants (**DSS**); and
- Multiple precursor chemicals, additives or impurities (**P/A/I**)

This publication presents the results of cases analyzed and completed by the CTEB laboratory from October 1, 2022 through December 31, 2022.

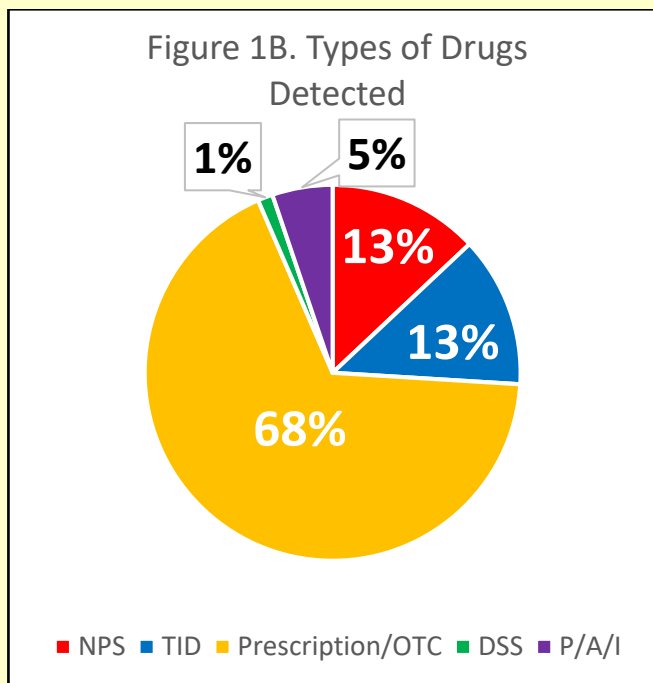
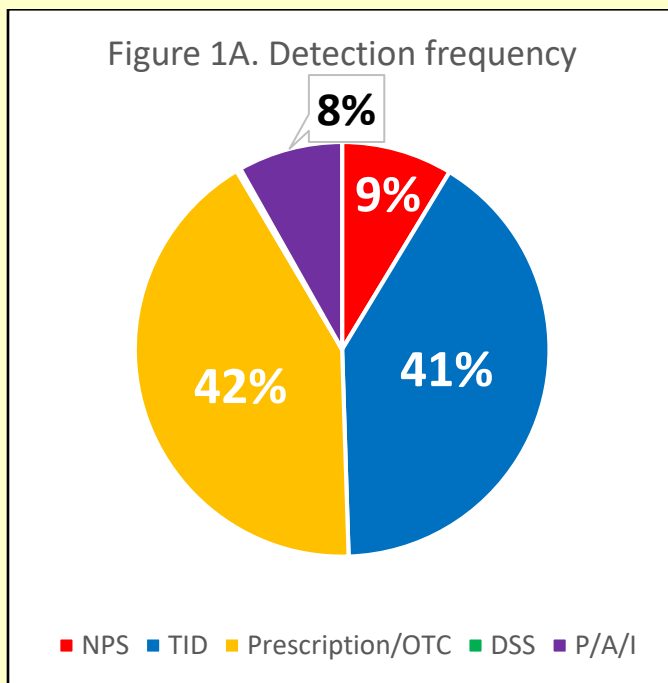
Summary

Between October 1, 2022 through December 31, 2022, 100 biological samples from 99 cases originating from 14 states namely, Alabama (8), California (2), Georgia (4), Kentucky (29), Louisiana (3), Maryland (3), North Carolina (1), Nebraska (17), Oregon (3), South Carolina (4), Tennessee (14), Texas (1), Utah (3), and Wisconsin (7) were submitted to DEA TOX. These samples were analyzed for NPS, TID, prescription or OTC drugs, DSS, and P/A/I. The biological samples submitted consisted of 12 serum, 9 plasma, 56 whole blood, 21 urine, and 2 tissue samples.

DEA TOX identified and confirmed a total of 600 drugs and metabolites that consisted of 52 NPS detections, 245 TID detections, 252 prescription or OTC drug detections, 2 DSS¹, and 49 P/A/I detections during this reporting period (Fig. 1A). While some drugs identified could be placed in more than one category, for purposes of this report and for consistency, DEA TOX placed such substances in a single category only. Many prescription drugs that are commonly abused and encountered are listed as TID. Substances that are not approved by the Food and Drug Administration for medical use within the U.S. are considered NPS.

A breakdown of the 600 total drug and metabolite confirmations demonstrated 77 different drugs, which consisted of 10 NPS, 10 TID, 52 prescription and OTC drugs, 1 DSS and 4 P/A/I (Fig. 1B).

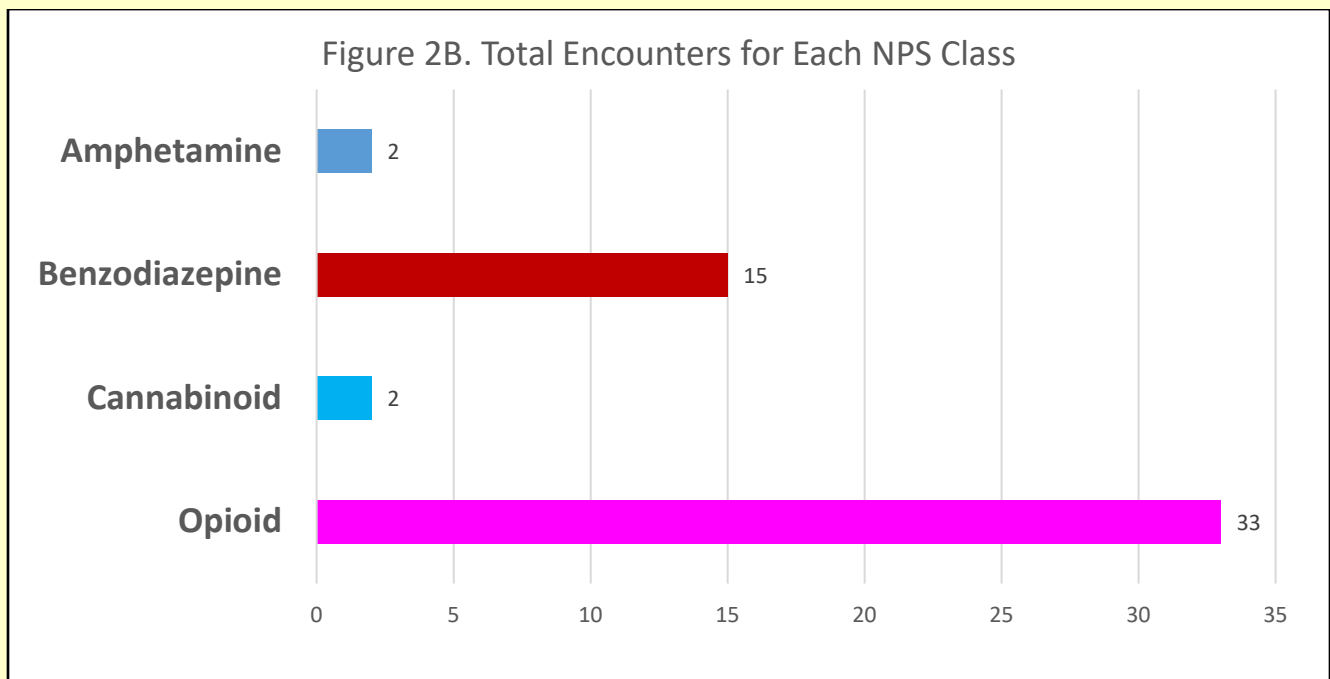
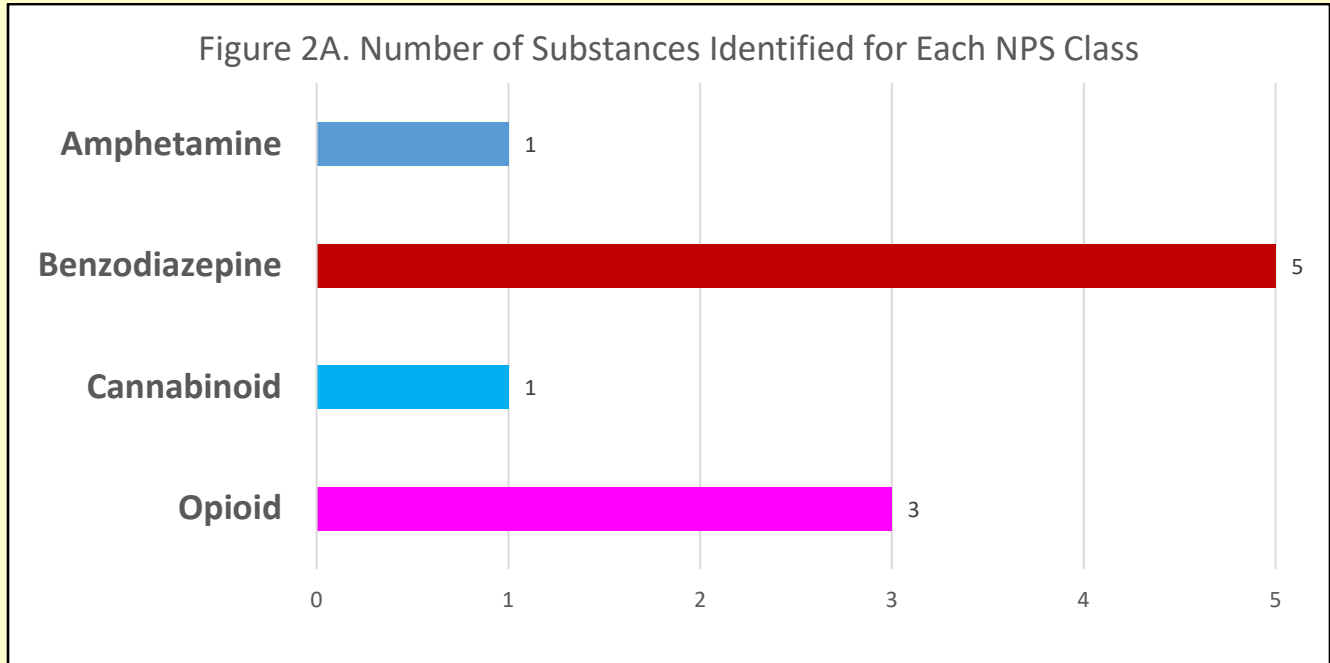
Of the cases submitted this quarter, 28 out of the 99 cases (28%) detected at least one NPS. In addition, 49 out of the 99 cases (49.5%) contained fentanyl.



¹ The two detections for the DSS category generated a value of 0.003% thus is not shown in Figure 1A

New Psychoactive Substances

DEA TOX confirmed 52 detections comprising of 10 NPS[§] (Table 1) from four different classes of drugs (Figure 2A) in the fourth quarter of 2022. The total encounters for each NPS class are summarized in Figure 2B.



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Table 1. NPS detected – Fourth Quarter 2022

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Amphetamine	MDA	1	KY			14.5	
	MDMA	1	KY			660	
Benzodiazepine	8-Amino clonazolam	4	GA, NE, MD, TN	0.4		0.7-15.9	
	Bromazolam	8	GA, KY(2) TN(5)	17.5		0.1-62.9	
	Deschloroetizolam	1	KY			6.8	
	Etizolam	1	TN			0.7	
	Flualprazolam	1	GA	3.3			
Cannabinoid	Delta-8-THC	1	KY	5.7			
	11-nor-9-carboxy-delta-8-THC	1	KY	46.9			
Opioids	7-OH Mitragynine	3	GA, KY, LA	15.1			1960
	Despropionyl <i>para</i> -fluorofentanyl	7	AL, CA, GA, KY, TN(2), WI	0.6		0.1-1.7	62.5
	Metonitazene	2	KY, TN			2.9-13.8	
	Mitragynine	3	GA, KY, LA	139			1070
	<i>para</i> -Fluorofentanyl	18	AL, CA(2) GA(2), KY(3), NE, TN(7), WI(2)	1.2-17.7		0.2-10.5	1.9-312

* CA – California; GA – Georgia; KY – Kentucky; MD – Maryland; NE – Nebraska; TN – Tennessee; WI – Wisconsin

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Traditional Illicit Drugs

DEA TOX confirmed 245 detections comprising of 10 TIDs[§] (Table 2) in the fourth quarter of 2022.

Table 2. TID detected – Fourth Quarter 2022

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Amphetamine	4-OH Methamphetamine	4	KY(2), NE, TN			1.3-19.8	189-8075
	Amphetamine	14	GA(2), KY(4), NE(6), TN(2)	118-978		12-434	1210-15400
	Methamphetamine	32	AL, CA, GA(3), KY(10), NE(6), OR(2), SC, TN(8)	10.5-5940	7.9-107	1.6-7870	63.7-126000
Arylcyclohexylamine	Ketamine	4	KY(3), WI				99.6-50700
Cannabinoid	11-nor-9-carboxy-delta-9-THC	6	KY, NE, OR, SC, UT, WI		49-65.6	46-66.7	70.5-708
	Delta-9-THC	1	TN			34	
Cocaine	Benzoylcegonine	29	AL(2), GA(2), KY(8), NE(7), OR(2), TN(4), WI(4)	15.5-1700	10.2-21.8	2.5-1880	4.0-349000
	Cocaethylene	9	AL, GA, KY(2), NE(3), TN, WI	NQ		NQ	NQ
	Cocaine	16	AL, GA, KY(4), NE(5), TN(3), WI(2)	94.2		2.1-51.3	2.7-10500
	Ecgonine Methyl Ester	16	AL(2), GA(2), KY(5), NE(2), OR(2), TN, WI(2)	NQ		NQ	NQ

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Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Opioids	Beta-hydroxy Fentanyl	14	KY(5), NE(3), TN(3), WI(3)			0.6-2.9	8.8-410
	Desmethyl-cis-tramadol	2	KY, TN			49.9	20.9
	Fentanyl	43	AL, GA(3), KY(13), NE(11), OR(2), SC, TN(8), TX, WI(3)	4.7-104	0.8-2.8	4.9-2250	0.6-69.0
	Hydrocodone	3	KY, TN(2)			12.9-19.2	177
	Morphine	4	NE(2), TN(2)			1.6-6.6	
	Norfentanyl	37	AL, GA, KY(12), NE(11), OR(2), SC, TN(6), WI(3)	0.9-9.6	0.3-2.0	0.3-14.4	1.7-13600
	Oxycodone	6	KY(2), NE, OR, TN, WI		6.3	0.8-7.3	23-23200
	Tramadol	5	KY(3), TN(2)			0.2-1020	7-28.8

* AL – Alabama; CA – California; GA – Georgia; KY – Kentucky; LA– Louisiana; MD – Maryland; NE– Nebraska, OR– Oregon, SC – South Carolina; TN – Tennessee; TX – Texas; UT – Utah; WI – Wisconsin

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine; NQ – Not Quantified

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Prescription and Over the Counter Drugs

DEA TOX confirmed 252 detections comprising of 52 prescription or OTC drugs[§] (Table 3) in the fourth quarter of 2022. Drugs for the prescription/OTC drugs panel are not typically quantitated unless specifically requested thus “Confirmed Levels” are not provided.

Table 3. Prescription or OTC drugs detected – Fourth Quarter 2022

Drug Class	Drug	Freq.	States Found*
Anesthetic	Lidocaine	7	AL, GA, NE(3), TN, SC
Antibiotic	Linezolid	1	TN
Anticonvulsant	Gabapentin	15	KY(3), LA, GA, NE(4), OR, TN(4), WI
	Lamotrigine	2	KY, UT
	Topiramate	1	NE
Antidepressant	Citalopram	5	KY, NC, NE(2), TN
	Duloxetine	2	KY, TN
	Fluoxetine	2	KY, NE
	mCPP**	6	KY(4), NE, TN
	Norfluoxetine	2	KY, NE
	Paroxetine	1	WI
	Pipradrol	1	WI
	Sertraline	2	WI, KY
	Trazodone	9	KY(4), NE(2), TN(3)
	Venlafaxine	1	UT
Antidiarrheal	Loperamide	3	GA, TN, WI
Antihistamine	Chlorpheniramine	2	KY, NE
	Diphenhydramine	15	GA, KY(6), NC, NE(2), OR, TN(2), UT, WI
	Doxylamine	4	AL, NE, TN, WI
	Hydroxyzine	8	CA, KY(2), NE(2), OR, WI(2)
	Promethazine	2	KY, NE
	Pseudoephedrine	2	CA, NE
Antipsychotic	Aripiprazole	1	TN
	Haloperidol	2	OR, UT
	Ziprasidone	1	TN
Anxiolytic	Buspirone	3	NE, TN, WI

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Drug Class	Drug	Freq.	States Found*
Benzodiazepine	7-amino Clonazepam	5	KY, NE, TN, WI(2)
	Alpha-hydroxy Alprazolam	2	NE, WI
	Alprazolam	7	AL, GA, NE(3), TN, WI
	Clonazepam	3	KY, NE, WI
	Diazepam	4	GA, LA, NE(2)
	Lorazepam	9	KY(4), OR, TN(2), UT, WI
	Midazolam	9	AL, KY(4), NE, OR, TN, UT
	Nordiazepam	6	GA, KY, LA, NE(2), WI
	Oxazepam	3	KY, NE, WI
	Temazepam	2	NE, WI
Antidiabetic	Metformin	1	KY
Cardiovascular	Amiodarone	7	AL, GA, KY, NE(2), TN, TX
	Atenolol	1	CA
	Atorvastatin	1	LA
	Atropine	6	AL, KY, NE, TN(2), TX
	Carvedilol	2	LA, NE
	Clonidine	2	KY, NE
	Diltiazem	2	AL, TN
	Labetalol	2	KY, SC
	Metoprolol	3	TN(2), WI
	Verapamil	1	WI
Warfarin	1	NE	
Cough Suppressant	Dextromethorphan	6	AL, KY(2), NE(2), TN
	Dextrophan	6	AL, KY(2), NE(2), TN
Diuretic	Furosemide	1	KY
Muscle Relaxant	Cyclobenzaprine	1	KY
	Orphenadrine	1	NE
Opioid	Buprenorphine	4	OR, TN, WI(2)
	EDDP	4	NE(4)
	Methadone	6	KY(2), NE(4)
	Naloxone	30	AL, GA(2), KY(11), NE(8), TN(3), TX, WI
	Norbuprenorphine	5	OR, TN, WI(3)
	Remifentanilic acid	1	LA
Pain Reliever	Acetaminophen	7	GA, KY(3), NE, TN(2)
	Naproxen	1	NE

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*AL – Alabama; CA – California; GA – Georgia; KY – Kentucky; LA – Louisiana; MD – Maryland;
NE – Nebraska, OR – Oregon, SC – South Carolina; TN – Tennessee; TX – Texas; UT – Utah;
WI – Wisconsin

**mCPP is an expected metabolite of trazodone

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Dietary Supplement Stimulants

DEA TOX confirmed two detection of one DSS (Table 4) in the fourth quarter of 2022.

Table 4. DSS detected – Fourth Quarter 2022

Drug Class	Drug	Freq.	States Found*
Stimulant	Hordenine	2	WI

* WI – Wisconsin

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Precursors/Additives/Impurities

DEA TOX confirmed 49 detections comprising of four P/A/I[§] (Table 5) in the fourth quarter of 2022.

Table 5. P/A/I detected – Fourth Quarter 2022

Drug Class	Drug	Freq.	States Found*	Confirmed Levels (ng/mL)**			
				S	P	WB	U
Additive	Quinine	14	GA(2), KY(5), NE(2), TN(3), TX, WI			15.4-25.4	846
	Xylazine	7	AL, KY(3), NE, TN(2)			0.1-4.0	15.4-52.0
Impurity	N,N-Dimethylamphetamine	12	GA(2), KY(3), NE(5), TN(2)	146-546		1.8-26.7	4.7-9570
Precursor	4-ANPP	16	GA, KY(6), NE(3), OR, TN(3), WI(2)	8.9	1.2	0.4-5.7	3.9-104

* AL – Alabama; GA – Georgia; KY – Kentucky; NE – Nebraska; OR – Oregon; TN – Tennessee; TX – Texas; WI – Wisconsin

**S – Serum; P – Plasma; WB – Whole Blood; U – Urine; NQ – Not Quantified

§ - Parent drugs or metabolites are only counted once for the number of drugs detected in Tables 1-5. If only a metabolite is encountered in the absence of a parent drug, it will still be counted as a unique drug. Both parent drugs and metabolites are counted as detections.

Contact Information

We invite medical and law enforcement facilities to contact our program if you encounter an overdose of a suspected synthetic drug and desire to have any leftover biological samples (blood preferred) analyzed further for such synthetic substances.

- **Sample Qualifications:**

- Patients thought to have ingested a synthetic drug, where the traditional drug screen has produced little or no viable options to explain the symptoms exhibited by the patient (alcohol and THC are exempted).

- **How to Contact Us and Send Your Samples:**

- Once the above qualifications are satisfied:
 - Email DEATOX@DEA.GOV with a brief description of the case (including initial toxicology screen and history) and a request for testing.
 - DEA will respond to each inquiry, and if approved, will send the instructions for packing and shipping of sample(s) to UCSF.
 - The main reason for disapproval of a case would be the identification of substances including methamphetamine, heroin, fentanyl, cocaine, LSD, PCP etc. in a routine toxicology screening at your facility.
 - This program's goal is to connect symptom causation to abuse of newly emerging synthetic drugs (e.g. synthetic cannabinoids, synthetic cathinones, fentanyl-related substances, other hallucinogens etc.).
- Ensure that you de-identify and label the sample with a numerical value, sex, date of birth or age, and the date and time the sample was collected in accordance with the labeling instructions (sent with shipping instructions).
- Keep a master list of the patients and the numerical values you allocated to each sample at your institution.

- **Cost of Sample Analysis:**

- DEA will cover the full cost of testing the patient samples.
 - The sender will only be responsible for paying for packing and shipping samples to UCSF.

- **Turn-around Time:**

- Results are expected within three to four weeks of receipt of the sample at UCSF except in rare occurrences when a novel substance is identified.

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**Clinical Toxicology
and Environmental Biomonitoring Laboratory**