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CONFIDENTIAL

Demo Report

Report Issued 08/15/2022 09:02

To: **88888**
Forensic Example Report
Attn: Example Reports
200 Welsh Road
Horsham, PA 19044

Patient Name	4177B-POS
Patient ID	4177B-POS
Chain	21001835
DOB	Not Given
Sex	Not Given
Workorder	21001835

Positive Findings:

Analyte	Result	Units	Matrix Source
Ethanol	**85**	**mg/dL**	**001 - Blood**
Blood Alcohol Concentration (BAC)	**0.085**	**g/100 mL**	**001 - Blood**
Phenobarbital	**5.0**	**mcg/mL**	**001 - Blood**
Alprazolam	**50**	**ng/mL**	**001 - Blood**
Cocaine	**50**	**ng/mL**	**001 - Blood**
6-Monoacetylmorphine - Free	**50**	**ng/mL**	**001 - Blood**
Delta-9 THC	**5.0**	**ng/mL**	**001 - Blood**
Fentanyl	**10**	**ng/mL**	**001 - Blood**
4-ANPP	**10**	**ng/mL**	**001 - Blood**
Warfarin	**50**	**mcg/mL**	**001 - Blood**

See Detailed Findings section for additional information

Testing Requested:

Test	Test Name
4177B	Postmortem, SUIDS Screen, Blood (Forensic)

Specimens Received:

ID	Tube/Container	Volume/ Mass	Collection Date/Time	Matrix Source	Labeled As
001	Clear vial	Not Given	Not Given	Blood	Not Applicable

All sample volumes/weights are approximations.

Specimens received on 12/13/2021.

Detailed Findings:

Analysis and Comments	Result	Units	Rpt. Limit	Specimen Source	Analysis By
Ethanol	85	mg/dL	10	001 - Blood	Headspace GC
Blood Alcohol Concentration (BAC)	0.085	g/100 mL	0.010	001 - Blood	Headspace GC
Phenobarbital	5.0	mcg/mL	0.50	001 - Blood	GC/MS
Alprazolam	50	ng/mL	5.0	001 - Blood	LC-MS/MS
Cocaine	50	ng/mL	20	001 - Blood	GC/MS
6-Monoacetylmorphine - Free	50	ng/mL	1.0	001 - Blood	LC-MS/MS
Delta-9 THC	5.0	ng/mL	0.50	001 - Blood	LC-MS/MS
Ethanol	Confirmed	mg/dL	10	001 - Blood	Headspace GC
Fentanyl	10	ng/mL	0.10	001 - Blood	LC-MS/MS
4-ANPP	10	ng/mL	0.10	001 - Blood	LC-MS/MS
Warfarin	50	mcg/mL	0.20	001 - Blood	LC-MS/MS

Other than the above findings, examination of the specimen(s) submitted did not reveal any positive findings of toxicological significance by procedures outlined in the accompanying Analysis Summary.

Reference Comments:

1. 4-ANPP (Despropionyl fentanyl) - Blood:

   4-ANPP (despropionylfentanyl) is a precursor chemical used in the production of fentanyl and is also a fentanyl metabolite. It may be used in the production of other related compounds such as acetyl fentanyl, butyryl fentanyl and furanyl fentanyl and may be a metabolite of these and other fentanyl-related compounds. It is considered to be pharmacologically weak.

2. 6-Monoacetylmorphine - Free (6-MAM; Heroin Metabolite) - Blood:

   6-monoacetylmorphine (6-MAM) is the 6-monoacetylated form of morphine, which is pharmacologically active. When present, it is generally indicative of heroin (diacetylmorphine) use. 6-MAM has also been reported to occur as an artifact in samples with unusually high blood morphine concentrations.

   A healthy man administered 12 mg heroin intravenously achieved peak blood concentrations at two minutes post injection of 150 ng/mL of 6-MAM and 44 ng/mL of morphine, which declined with half-lives of 7 minutes and 33 minutes, respectively.

   Eight subjects who died within fifteen minutes of heroin administration had postmortem blood 6-MAM concentrations averaging 19 ng/mL with a range from less than 1.0 to 82 ng/mL.

3. Alprazolam (Xanax®) - Blood:

   Alprazolam is a DEA Schedule IV second-generation benzodiazepine, which is effective at very low doses. It shares the actions of other benzodiazepines in the management of anxiety disorders and short-term relief of anxiety associated with depressive symptoms. Alpha-hydroxyalprazolam is an active metabolite of alprazolam. Common CNS-depressant side effects of alprazolam include drowsiness and fatigue. For anxiety, daily doses of 0.8 to 4 mg are effective whereas for phobic and panic disorders, 6 to 9 mg daily is recommended.

   Reported therapeutic plasma concentrations of alprazolam are proportional to dose given: 3 mg/day produced steady-state levels of 30 ng/mL; 6 mg/day, 60 ng/mL; and 9 mg/day, 100 ng/mL.

   In reported cases involving driving under the influence, alprazolam concentrations ranged from 8 - 640 ng/mL. Alcohol greatly enhances the activity of benzodiazepines.

   Reported blood concentrations of alprazolam in alprazolam-related fatalities ranged from 100 - 400 ng/mL (mean, 200 ng/mL). In combination with other central nervous system depressants such as ethyl alcohol, alprazolam can become toxic at low concentrations.

Reference Comments:

4. Cocaine - Blood:

   Cocaine is a DEA Schedule II controlled central nervous stimulant drug. Effects following cocaine use can include euphoria, excitement, restlessness, risk taking, sleep disturbance, and aggression. A period of mental and physical fatigue and somnolence follow the use of cocaine after the excitant-stimulant effects wear off. Cocaine is metabolized to the inactive compounds benzoylecgonine, ecgonine methyl ester, and ecgonine. Benzoylecgonine and ecgonine methyl ester can form from cocaine breakdown after death and even after sample collection. The average blood cocaine concentration in 906 impaired drivers was 87 ng/mL (range 5 - 2390 ng/mL). Blood cocaine concentrations in patients admitted to an emergency room for cocaine related medical complaints were 260 ng/mL (SD = 500 ng/mL). Cocaine concentrations in plasma following oral administration of 2 g/day over 6 days, averaged 1260 ng/mL. The average blood cocaine concentration in 37 cocaine related fatalities was 4600 ng/mL (range 40 - 31000 ng/mL).

5. Delta-9 THC (Active Ingredient of Marijuana) - Blood:

   Marijuana is a DEA Schedule I hallucinogen. Pharmacologically, it has depressant and reality distorting effects. Collectively, the chemical compounds that comprise marijuana are known as Cannabinoids.

   Delta-9-THC is the principle psychoactive ingredient of marijuana/hashish. It rapidly leaves the blood, even during smoking, falling to below detectable levels within several hours. Delta-9-carboxy-THC (THCC) is the inactive metabolite of THC and may be detected for up to one day or more in blood. Both delta-9-THC and THCC may be present substantially longer in chronic users.
   THC concentrations in blood are usually about one-half of serum/plasma concentrations. Usual peak levels in serum for 1.75% or 3.55% THC marijuana cigarettes: 50 - 270 ng/mL at 6 to 9 minutes after beginning smoking, decreasing to less than 5 ng/mL by 2 hrs.

6. Ethanol (Ethyl Alcohol) - Blood:

   Ethyl alcohol (ethanol, drinking alcohol) is a central nervous system depressant and can cause effects such as impaired judgment, reduced alertness and impaired muscular coordination. Ethanol can also be a product of decomposition or degradation of biological samples. The blood alcohol concentrations (BAC) can be expressed as a whole number with the units of mg/dL or as a decimal number with units of g/100 mL which is equivalent to % w/v. For example, a BAC of 85 mg/dL equals 0.085 g/100 mL or 0.085% w/v of ethanol.

7. Fentanyl (Duragesic®; Sublimaze®) - Blood:

   Fentanyl is a DEA Schedule II synthetic morphine substitute anesthetic/analgesic. It is reported to be 80 to 200 times as potent as morphine and has a rapid onset of action as well as addictive properties.

   It is reported that patients lost consciousness at mean plasma levels of fentanyl of 34 ng/mL when infused with 75 mcg/Kg over a 15 min period; peak plasma levels averaged 50 ng/mL.

   After application of a fentanyl transdermal preparation (patch), serum fentanyl concentrations are reported to be in the following ranges within 24 hours:
   25 mcg/hour patch: 0.3 - 1.2 ng/mL
   50 mcg/hour patch: 0.6 - 1.8 ng/mL
   75 mcg/hour patch: 1.1 - 2.6 ng/mL
   100 mcg/hour patch: 1.9 - 3.8 ng/mL

   Following removal of the patch, serum fentanyl concentrations are reported to decrease with a mean elimination half-life of 17 hours (range, 13 to 22 hours).

   The mean peak plasma serum fentanyl concentration in adults given an 800 mcg oral transmucosal fentanyl preparation over 15 minutes is reported at 2.1 ng/mL (range, 1.4 - 3.0 ng/mL) at approximately 0.4 hours.

   Signs associated with fentanyl toxicity include severe respiratory depression, seizures, hypotension, coma and death. In fatalities from fentanyl, blood concentrations are variable and have been reported as low as 3 ng/mL.

Reference Comments:

8. Phenobarbital (Luminal®) - Blood:

   Phenobarbital is a DEA Schedule IV barbiturate derivative with a long duration of action. It is primarily used as therapy in the control of seizures due to its CNS-depressant activity. It may be encountered as a parent compound or as the metabolite of primidone. At excessively high levels, drowsiness, slurring of speech, ataxia, respiratory depression and coma may be manifested. The recommended therapeutic range for effective anticonvulsant therapy is 10 - 30 mcg/mL.

   Reported blood levels of phenobarbital in fatalities associated with use of this compound range from 64 - 116 mcg/mL.

   Concomitant use of phenobarbital with other CNS-depressant agents, e.g., ethyl alcohol, would produce at least additive CNS-depressant effects.

9. Warfarin (Coumadin®) - Blood:

   Warfarin is an anticoagulant used in the prophylaxis and treatment of venous thrombosis, pulmonary and other emboli and in the treatment of coronary occlusion. It is also used as a rodenticide. The usual initial adult dose is 2 to 5 mg daily and may be increased to 10 mg to maintain the prothrombin time International Normalized Ratio (INR) within the target range. Warfarin can induce fatal internal bleeding and has a narrow therapeutic index.

   Peak plasma concentrations following single 10 mg doses averaged 0.6 mcg/mL for both R-warfarin and S-warfarin (combined concentration 1.2 mcg/mL). The blood to plasma ratio is approximately 0.5. This test is not chiral specific and does not distinguish between the R and S enantiomers of warfarin.

Analysis Summary and Reporting Limits:

All of the following tests were performed for this case. For each test, the compounds listed were included in the scope. The Reporting Limit listed for each compound represents the lowest concentration of the compound that will be reported as being positive. If the compound is listed as None Detected, it is not present above the Reporting Limit. Please refer to the Positive Findings section of the report for those compounds that were identified as being present.

Test 4177B - Postmortem, SUIDS Screen, Blood (Forensic) - Blood

-Analysis by Enzyme-Linked Immunosorbent Assay (ELISA) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Barbiturates	0.040 mcg/mL	Salicylates	120 mcg/mL
Cannabinoids	10 ng/mL		

-Analysis by Headspace Gas Chromatography (GC) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Acetone	5.0 mg/dL	Isopropanol	5.0 mg/dL
Ethanol	10 mg/dL	Methanol	10 mg/dL

-Analysis by High Performance Liquid Chromatography/Time of Flight-Mass Spectrometry (LC/TOF-MS) for: The following is a general list of analyte classes included in this screen. The detection of any specific analyte is concentration-dependent. Note, not all known analytes in each specified analyte class are included. Some specific analytes outside of these classes are also included. For a detailed list of all analytes and reporting limits, please contact NMS Labs. Amphetamines, Anticonvulsants, Antidepressants, Antihistamines, Antipsychotics, Benzodiazepines, CNS Stimulants, Cocaine and Metabolites, Hallucinogens, Hypnosedatives, Muscle Relaxants, Non-Steroidal Anti-Inflammatory Agents, Opiates and Opioids.

-Analysis by Spectrophotometry (SP) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Carboxyhemoglobin	5 %Saturation		

Analysis Summary and Reporting Limits:

-Analysis by Spectrophotometry (SP) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Methemoglobin	1.0 %Saturation	Sulfhemoglobin	2.0 %Saturation

Test 50011B - Barbiturates Confirmation, Blood - Blood

-Analysis by Gas Chromatography/Mass Spectrometry (GC/MS) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Butalbital	0.20 mcg/mL	Phenobarbital	0.50 mcg/mL
Pentobarbital	0.20 mcg/mL	Secobarbital	0.20 mcg/mL

Test 50012B - Benzodiazepines Confirmation, Blood - Blood

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
7-Amino Clonazepam	5.0 ng/mL	Flurazepam	2.0 ng/mL
Alpha-Hydroxyalprazolam	5.0 ng/mL	Hydroxyethylflurazepam	5.0 ng/mL
Alprazolam	5.0 ng/mL	Hydroxytriazolam	5.0 ng/mL
Chlordiazepoxide	20 ng/mL	Lorazepam	5.0 ng/mL
Clobazam	20 ng/mL	Midazolam	5.0 ng/mL
Clonazepam	2.0 ng/mL	Nordiazepam	20 ng/mL
Desalkylflurazepam	5.0 ng/mL	Oxazepam	20 ng/mL
Diazepam	20 ng/mL	Temazepam	20 ng/mL
Estazolam	5.0 ng/mL	Triazolam	2.0 ng/mL

Test 50014B - Cocaine and Metabolites Confirmation, Blood - Blood

-Analysis by Gas Chromatography/Mass Spectrometry (GC/MS) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Benzoylecgonine	50 ng/mL	Cocaine	20 ng/mL
Cocaethylene	20 ng/mL		

Test 50016B - Opiates - Free (Unconjugated) Confirmation, Blood - Blood

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
6-Monoacetylmorphine - Free	1.0 ng/mL	Hydromorphone - Free	1.0 ng/mL
Codeine - Free	5.0 ng/mL	Morphine - Free	5.0 ng/mL
Dihydrocodeine / Hydrocodol - Free	5.0 ng/mL	Oxycodone - Free	5.0 ng/mL
Hydrocodone - Free	5.0 ng/mL	Oxymorphone - Free	1.0 ng/mL

Test 52198B - Cannabinoids Confirmation, Blood - Blood

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
11-Hydroxy Delta-9 THC	1.0 ng/mL	Delta-9 Carboxy THC	5.0 ng/mL

Analysis Summary and Reporting Limits:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Delta-9 THC	0.50 ng/mL		

Test 52250B - Alcohols and Acetone Confirmation, Blood - Blood

-Analysis by Headspace Gas Chromatography (GC) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Acetone	5.0 mg/dL	Isopropanol	5.0 mg/dL
Ethanol	10 mg/dL	Methanol	5.0 mg/dL

Test 52486B - Fentanyl and 4-ANPP Confirmation, Blood - Blood

-Analysis by High Performance Liquid Chromatography/ Tandem Mass Spectrometry (LC-MS/MS) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
4-ANPP	0.10 ng/mL	Fentanyl	0.10 ng/mL
Acetyl Fentanyl	0.10 ng/mL	Norfentanyl	0.20 ng/mL

Test 52505B - Warfarin Confirmation, Blood - Blood

-Analysis by High Performance Liquid Chromatography/Tandem Mass Spectrometry (LC-MS/MS) for:

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Warfarin	0.20 mcg/mL		