



NMS Labs

CONFIDENTIAL

200 Welsh Road, Horsham, PA 19044-2208

Phone: (215) 657-4900 Fax: (215) 657-2972

e-mail: nms@nmslabs.com

Robert A. Middleberg, PhD, F-ABFT, DABCC-TC, Laboratory Director

Demo Report**Report Issued** 04/22/2022 11:18**To:** 88888Forensic Example Report
Attn: Example Reports
200 Welsh Road
Horsham, PA 19044**Patient Name** 8151B-POS
Patient ID 8151B-POS
Chain 20001776
DOB Not Given
Sex Not Given
Workorder 20001776

Page 1 of 5

Positive Findings:

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Matrix Source</u>
Ethanol	85 ±6	mg/dL	001 - Blood
Blood Alcohol Concentration (BAC)	0.085 ±0.006	g/100 mL	001 - Blood
Alprazolam	10 ±2	ng/mL	001 - Blood
Delta-9 THC	5.0 ±1.0	ng/mL	001 - Blood
Cocaine	50 ±11	ng/mL	001 - Blood
Morphine - Free	10 ±2	ng/mL	001 - Blood
6-Monoacetylmorphine - Free	5.0 ±1.3	ng/mL	001 - Blood
Fentanyl	5.0 ±0.9	ng/mL	001 - Blood

Quantitative results are reported as Result +/- Uncertainty of Measurement (UM). Ethanol results are reported at a coverage probability of 99.73%; all other analytes are reported at a coverage probability of 95.45%.

See Detailed Findings section for additional information

Testing Requested:

<u>Test</u>	<u>Test Name</u>
8151B	DUID/DRE Panel (w/Alcohol) ProofPOSITIVE®, Blood (Forensic)

Specimens Received:

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

All sample volumes/weights are approximations.

Specimens received on 08/24/2020.



CONFIDENTIAL

Workorder

20001776

Chain

20001776

Patient ID

8151B-POS

Page 2 of 5

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
Ethanol	Confirmed	mg/dL	10	001 - Blood	Headspace GC
Alprazolam	10	ng/mL	5.0	001 - Blood	LC-MS/MS
Delta-9 THC	5.0	ng/mL	0.50	001 - Blood	LC-MS/MS
Cocaine	50	ng/mL	20	001 - Blood	GC/MS
Morphine - Free	10	ng/mL	5.0	001 - Blood	LC-MS/MS
6-Monoacetylmorphine - Free	5.0	ng/mL	1.0	001 - Blood	LC-MS/MS
Fentanyl	5.0	ng/mL	0.10	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. 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 6 minutes and 33 minutes, respectively.

2. Alprazolam (Xanax®) - Blood:

Alprazolam is a low-dose benzodiazepine used for the treatment of anxiety disorders and short-term relief of anxiety associated with depressive symptoms. Alpha-hydroxyalprazolam is an active metabolite of alprazolam. They share the actions and adverse reactions of other CNS-depressants. Alcohol greatly enhances the activity of benzodiazepines. Common adverse effects of alprazolam include drowsiness, fatigue, sedation, dizziness, weakness, unsteadiness and disorientation. Signs of CNS depression can include the presence of horizontal gaze nystagmus, lack of convergence of the eyes, normal pupil size with slow reaction to light and reduced pulse and blood pressure. 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 a population of 219 drivers arrested for driving under the influence, Alprazolam concentrations ranged from 5 - 1580 ng/mL, with a mean of 103 ng/mL. Other drugs may also have been present. Studies confirm that alprazolam is capable of causing significant impairment to driving and psychomotor abilities across a wide range of concentrations.

3. Blood Alcohol Concentration (BAC) - Blood:

I certify that I am the analyst of record for this report. In this capacity, I am authorized by NMS Labs to provide the final analytical review of the results in this case. This report cannot be released without my review, and I am responsible for the accuracy of results contained herein. This laboratory is accredited and licensed, and complies with accreditation standards for internal chain of custody, standard operating procedures, analysis of appropriate blanks, calibrators and controls, and other quality control and quality assurance measures, all of which I am familiar with, and that ensure test result accuracy. A complete list of accreditations and licensures are listed on our website at www.nmslabs.com. I have considered the information available to me at this time, and it is my opinion that testing was properly performed in compliance with laboratory standards and policies, and the results are supported by the analytical data and accurately reflect the toxicological findings for this subject. If lawfully subpoenaed, I will testify to the above facts in a court of law.

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.

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

Delta-9-THC is the principle psychoactive ingredient of marijuana (cannabis, hashish). It is also the active component of the prescription medication Marinol®. Whole blood THC concentrations are typically half those in a corresponding plasma sample. After smoking a user-preferred 300 mcg/kg dose average plasma THC concentrations at 35 minutes were reported at 16.1 (range 4.7 - 30.9) ng/mL, and had declined to 1.5 (range 0.4 - 3.2) ng/mL after 190 minutes. Marijuana use causes relaxation, distorted perception, euphoria and feelings of well being, along with confusion, dizziness, somnolence, ataxia, speech difficulties, lethargy and muscular weakness. Effects of marijuana use on driving ability may include weaving, inattention, poor coordination and slowed reaction time with increased error rates in complex tasks. These effects worsen with increased THC concentrations. Peak effects typically last from 1-4 hours. THC concentrations in the blood decline rapidly after use, and may be undetectable within 1-3 hours following smoking. Numerous studies have associated marijuana use with impaired driving performance.

6. Ethanol (Ethyl Alcohol) - Blood:

Ethanol (beverage alcohol) is a central nervous system depressant. It causes impairment of cognitive, perceptual and psychomotor capabilities manifested as decrements in alertness, judgment, perception, coordination, response time and sense of care and caution. Potential effects on driving include, but are not limited to, weaving, crossing center or fog lines, failure to obey traffic signals, wide turns, inappropriate speed for conditions, and involvement in collisions. Generally, a person's level of intoxication will increase with rising blood alcohol concentration. Effects are more pronounced in individuals with limited tolerance, especially minors, however at blood alcohol concentrations of 80 mg/dL (0.08 g/100 mL or 0.08% w/v), virtually all individuals exhibit impairment on some critical driving measures.

Analysis performed in duplicate by, internally standardized, headspace Gas Chromatography (GC). The average of the two headspace GC results is reported.

NMS Labs is an approved Laboratory for Alcohol analysis in the Commonwealth of Pennsylvania.

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).

Reference Comments:

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.

Substance(s) known to interfere with the identity and/or quantity of the reported result: 4-methylphenethyl acetyl fentanyl

8. Morphine - Free - Blood:

Morphine (Duramorph, Roxanol, MS-Contin) is an opiate narcotic analgesic. It is also commonly found as a metabolite or breakdown product of codeine and heroin. A large portion of the morphine may be conjugated; the portion which is not conjugated is termed 'free morphine'. When found together with 6-monoacetylmorphine (6-MAM), it is an indicator that the likely source was heroin. Morphine is a powerful painkilling drug whose effects include analgesia, drowsiness, and sedation. Following excessive opiate use, pupils are typically constricted and unreactive to light. Pulse and blood pressure, and body temperature can be lowered. Psychomotor impairment is generally present, with increased body sway, and poor performance in divided attention tests. Users are sometimes described as 'on the nod', falling asleep in the middle of conversations or at inappropriate times. Tolerance can develop to the effects of opiates, and more experienced users are less susceptible to the impairing effects. Patients taking carefully controlled opiates under a doctor's supervision are less likely to be impaired than if abusing the medication. Intravenous administration of 10 mg morphine produced reported peak therapeutic blood levels of 60 ng/mL, which declined to 3 ng/mL after 36 hr. In a population of 676 drivers arrested for driving under the influence, Morphine concentrations ranged from 1.25 - 1290 ng/mL, with a mean of 52 ng/mL. Other drugs may also have been present. The narcotic and sedative effects of morphine may result in significant impairment of the skills necessary for safe driving.

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 54002B - Benzodiazepines Confirmation (DUID/DRE), Blood

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

<u>Analyte</u>	<u>Rpt. Limit</u>	<u>Analyte</u>	<u>Rpt. Limit</u>
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 54003B - Cannabinoids Confirmation (DUID/DRE), Blood

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

<u>Analyte</u>	<u>Rpt. Limit</u>	<u>Analyte</u>	<u>Rpt. Limit</u>
11-Hydroxy Delta-9 THC	1.0 ng/mL	Delta-9 THC	0.50 ng/mL
Delta-9 Carboxy THC	5.0 ng/mL		

Test 54004B - Cocaine and Metabolites Confirmation (DUID/DRE), Blood

Analysis Summary and Reporting Limits:

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

<u>Analyte</u>	<u>Rpt. Limit</u>	<u>Analyte</u>	<u>Rpt. Limit</u>
Benzoylecgconine	50 ng/mL	Cocaine	20 ng/mL
Cocaethylene	20 ng/mL		

Test 54006B - Opiates - Free (Unconjugated) Confirmation (DUID/DRE), Blood

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

<u>Analyte</u>	<u>Rpt. Limit</u>	<u>Analyte</u>	<u>Rpt. Limit</u>
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 54459B - DUID/DRE Fentanyl and Acetyl Fentanyl Confirmation, Blood

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

<u>Analyte</u>	<u>Rpt. Limit</u>	<u>Analyte</u>	<u>Rpt. Limit</u>
Acetyl Fentanyl	0.10 ng/mL	Norfentanyl	0.20 ng/mL
Fentanyl	0.10 ng/mL		

Test 8151B - DUID/DRE Panel (w/Alcohol) ProofPOSITIVE®, Blood (Forensic)

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

<u>Analyte</u>	<u>Rpt. Limit</u>	<u>Analyte</u>	<u>Rpt. Limit</u>
Amphetamines	20 ng/mL	Methadone / Metabolite	25 ng/mL
Barbiturates	0.040 mcg/mL	Methamphetamine / MDMA	20 ng/mL
Benzodiazepines	20 ng/mL	Opiates	20 ng/mL
Buprenorphine / Metabolite	0.50 ng/mL	Oxycodone / Oxymorphone	10 ng/mL
Cannabinoids	10 ng/mL	Phencyclidine	10 ng/mL
Carisoprodol / Metabolite	500 ng/mL	Tramadol / Metabolite	50 ng/mL
Cocaine / Metabolites	20 ng/mL	Zolpidem	5.0 ng/mL
Fentanyl / Acetyl Fentanyl	0.50 ng/mL		

-Analysis by Headspace Gas Chromatography (GC) for:

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

-Analysis by Headspace Gas Chromatography (GC) for:

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