NMS Labs
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

CONFIDENTIAL

Demo Report

Report Issued 06/07/2021 07:05

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

Patient Name 6946H-POS
Patient ID 6946H-POS
Chain 20001354
Age Not Given **DOB** Not Given
Gender Not Given
Workorder 20001354

Positive Findings:

Compound	Result	Units	Matrix Source
Benzoylecgonine	Positive	ng/g	001 - Hair
Cocaine	Positive	ng/g	001 - Hair
Cocaethylene	Positive	ng/g	001 - Hair
Dihydrocodeine / Hydrocodol	Positive	ng/g	001 - Hair
Codeine	Positive	ng/g	001 - Hair
Morphine	Positive	ng/g	001 - Hair
Hydrocodone	Positive	ng/g	001 - Hair
6-Monoacetylmorphine	Positive	ng/g	001 - Hair
Hydromorphone	Positive	ng/g	001 - Hair
Oxycodone	Positive	ng/g	001 - Hair
Oxymorphone	Positive	ng/g	001 - Hair
Phencyclidine	Positive	ng/g	001 - Hair
Amphetamine	Positive	ng/g	001 - Hair
Methamphetamine	Positive	ng/g	001 - Hair
MDA	Positive	ng/g	001 - Hair
MDMA	Positive	ng/g	001 - Hair
MDEA	Positive	ng/g	001 - Hair
Butabarbital	Positive	mcg/g	001 - Hair
Butalbital	Positive	mcg/g	001 - Hair
Amobarbital	Positive	mcg/g	001 - Hair
Pentobarbital	Positive	mcg/g	001 - Hair
Secobarbital	Positive	mcg/g	001 - Hair
Phenobarbital	Positive	mcg/g	001 - Hair
Diazepam	Positive	ng/g	001 - Hair
Nordiazepam	Positive	ng/g	001 - Hair
Oxazepam	Positive	ng/g	001 - Hair
Temazepam	Positive	ng/g	001 - Hair
Chlordiazepoxide	Positive	ng/g	001 - Hair
Lorazepam	Positive	ng/g	001 - Hair
Clonazepam	Positive	ng/g	001 - Hair
7-Amino Clonazepam	Positive	ng/g	001 - Hair
Alprazolam	Positive	ng/g	001 - Hair
Alpha-Hydroxyalprazolam	Positive	ng/g	001 - Hair
Midazolam	Positive	ng/g	001 - Hair
Methadone	Positive	ng/g	001 - Hair

See Detailed Findings section for additional information

Testing Requested:

Analysis Code	Description
6946H	Drugs of Abuse Screen (9 Panel), Hair

Specimens Received:

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

All sample volumes/weights are approximations.

Specimens received on 06/25/2020.

Detailed Findings:

Analysis and Comments	Result	Units	Rpt. Limit	Specimen Source	Analysis By
Hair Length	10	cm		001 - Hair	ELISA
Benzoylecgonine	Positive	ng/g	500	001 - Hair	GC/MS
Cocaine	Positive	ng/g	200	001 - Hair	GC/MS
Cocaethylene	Positive	ng/g	200	001 - Hair	GC/MS
Dihydrocodeine / Hydrocodol	Positive	ng/g	50	001 - Hair	LC-MS/MS
Codeine	Positive	ng/g	50	001 - Hair	LC-MS/MS
Morphine	Positive	ng/g	50	001 - Hair	LC-MS/MS
Hydrocodone	Positive	ng/g	50	001 - Hair	LC-MS/MS
6-Monoacetylmorphine	Positive	ng/g	50	001 - Hair	LC-MS/MS
Hydromorphone	Positive	ng/g	50	001 - Hair	LC-MS/MS
Oxycodone	Positive	ng/g	50	001 - Hair	LC-MS/MS
Oxymorphone	Positive	ng/g	50	001 - Hair	LC-MS/MS
Phencyclidine	Positive	ng/g	10	001 - Hair	LC-MS/MS
Amphetamine	Positive	ng/g	10	001 - Hair	LC-MS/MS
Methamphetamine	Positive	ng/g	10	001 - Hair	LC-MS/MS
MDA	Positive	ng/g	10	001 - Hair	LC-MS/MS
MDMA	Positive	ng/g	10	001 - Hair	LC-MS/MS
MDEA	Positive	ng/g	10	001 - Hair	LC-MS/MS
Butabarbital	Positive	mcg/g	2.0	001 - Hair	GC/MS
Butalbital	Positive	mcg/g	2.0	001 - Hair	GC/MS
Amobarbital	Positive	mcg/g	2.0	001 - Hair	GC/MS
Pentobarbital	Positive	mcg/g	2.0	001 - Hair	GC/MS
Secobarbital	Positive	mcg/g	2.0	001 - Hair	GC/MS
Phenobarbital	Positive	mcg/g	2.0	001 - Hair	GC/MS
Diazepam	Positive	ng/g	40	001 - Hair	LC-MS/MS
Nordiazepam	Positive	ng/g	40	001 - Hair	LC-MS/MS
Oxazepam	Positive	ng/g	40	001 - Hair	LC-MS/MS

Detailed Findings:

Analysis and Comments	Result	Units	Rpt. Limit	Specimen Source	Analysis By
Temazepam	Positive	ng/g	40	001 - Hair	LC-MS/MS
Chlordiazepoxide	Positive	ng/g	40	001 - Hair	LC-MS/MS
Lorazepam	Positive	ng/g	10	001 - Hair	LC-MS/MS
Clonazepam	Positive	ng/g	4.0	001 - Hair	LC-MS/MS
7-Amino Clonazepam	Positive	ng/g	10	001 - Hair	LC-MS/MS
Alprazolam	Positive	ng/g	10	001 - Hair	LC-MS/MS
Alpha-Hydroxyalprazolam	Positive	ng/g	10	001 - Hair	LC-MS/MS
Midazolam	Positive	ng/g	10	001 - Hair	LC-MS/MS
Methadone	Positive	ng/g	40	001 - Hair	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 (6-MAM; Heroin Metabolite) - Hair:

   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. It has been found together with morphine in hair of heroin users.

2. 7-Amino Clonazepam (Clonazepam Metabolite) - Hair:

   7-Amino Clonazepam is a metabolite of clonazepam.

3. Alpha-Hydroxyalprazolam (Alprazolam Metabolite) - Hair:

   Alpha-Hydroxyalprazolam is an active metabolite of alprazolam.

4. Alprazolam (Xanax®) - Hair:

   Alprazolam is used in the treatment of anxiety and panic disorder.

5. Amphetamine - Hair:

   Amphetamine is a Schedule II phenethylamine CNS-stimulant. It is used therapeutically in the treatment of narcolepsy and obesity and also in the treatment of hyperactivity in children. Amphetamine has a high potential for abuse. Amphetamine is also a metabolite of methamphetamine, benzphetamine, and selegiline.

6. Benzoylecgonine (Cocaine Degradation Product) - Hair:

   Benzoylecgonine is an inactive metabolite and chemical breakdown product of cocaine. 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. It has a half-life of 6 to 10 hours.

7. Butabarbital (Butisol Sodium) - Hair:

   Butabarbital is a barbiturate derivative with an intermediate duration of action. It is used for routine sedation and to relieve anxiety pre-operatively. Butabarbital is frequently abused, is additive in effect(s) with other CNS-depressants and is often found in combination with other compounds.

8. Butalbital - Hair:

   Butalbital is a barbiturate derivative with an intermediate duration of action. Signs noted following its administration include drowsiness, sedation and ataxia.

9. Chlordiazepoxide (Librium®) - Hair:

   Chlordiazepoxide is used for the management of anxiety and for aid in alcohol withdrawal. The compound is extensively metabolized to at least 4 active metabolites: norchlordiazepoxide, demoxepam, nordiazepam and oxazepam.

Reference Comments:

10. Clonazepam (Klonopin®) - Hair:

    Clonazepam is a benzodiazepine-derivative anticonvulsant agent. It is used in both the prophylaxis and treatment of various seizure disorders.

11. Cocaethylene (Cocaine/Ethanol By-Product) - Hair:

    Cocaethylene is a transesterification artifact formed in vivo when cocaine and alcohol are in the circulation at the same time. It is an active metabolite with activity equal to or greater than that of cocaine.

12. Cocaine - Hair:

    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.

13. Codeine - Hair:

    Codeine is a DEA Schedule III narcotic analgesic with central nervous system depressant activity. An adult therapeutic regimen for codeine is 30 to 60 mg four to six times daily as needed. Morphine is a demethylated metabolite of codeine. Hydrocodone is also a reported metabolite of codeine.

14. Diazepam (Valium®) - Hair:

    Diazepam is used primarily for its sedative anxiolytic or muscle relaxing effects. It is metabolized to several pharmacologically active compounds: nordiazepam, oxazepam and temazepam.

15. Dihydrocodeine / Hydrocodol - Hair:

    Dihydrocodeine (6-alpha-hydrocodol) is an opiate analgesic. It is available as a therapeutic agent (in products such as Synalgos-DC and DHC Plus) for oral use and can be formed in vivo as a metabolite of hydrocodone.

16. Hair Length - Hair:

    Head Hair:
    Hair collected from the back of the head grows at a rate of approximately 1 centimeter (cm) per month with some individual variability.

    Body Hair:
    Body hair grows at a rate of approximately 0.5 centimeters (cm) per month. However, because body hair has a longer period of growth latency, the period of time represented by any portion of body hair is more variable than for head hair.

17. Hydrocodone (Dicodid®) - Hair:

    Hydrocodone is a DEA Schedule II semisynthetic narcotic analgesic. It is similar to codeine in analgesic activity and is also widely used in cough syrups for its antitussive activity. This compound is reported to be highly addictive. For relief of pain, hydrocodone, as the bitartrate salt, is only available in oral form in combination with non-opiate drugs, e.g., acetaminophen. Active metabolites of hydrocodone include hydromorphone and hydrocodol (dihydrocodeine). Normal adult oral dosages range from 5 to 10 mg every 4 to 6 hr. Hydrocodone has also been demonstrated to be a metabolite of codeine.

    Hydrocodone is reported to be more toxic than codeine. In overdose, it produces the same manifestations as other opiates including: drowsiness, sedation, respiratory depression, coma and death.

18. Hydromorphone (Dilaudid®; Hydrocodone Metabolite) - Hair:

    Hydromorphone is a semi-synthetic narcotic opioid. It is also a metabolite of morphine. Hydromorphone is a strong analgesic for the relief of moderate to severe pain. Its addiction liability is at least that of morphine. This compound should be administered in the smallest effective dose possible. The normal adult oral dosage is 2 mg every 4 to 6 hours. For severe pain, the dosage may be increased to 4 mg every 4 to 6 hours.

    Hydromorphone shares the same toxic effects as other opioids, e.g., constipation, nausea, drowsiness, respiratory depression, coma and death.

19. Lorazepam (Ativan®) - Hair:

    Lorazepam is used in the treatment of anxiety and for short-term relief of anxiety associated with depressive symptoms.

Reference Comments:

20. MDA (3,4-Methylenedioxyamphetamine; Adam; MDMA Metabolite) - Hair:

    3,4-Methylenedioxyamphetamine (MDA) is an amphetamine derivative and a chemical analogue of 3,4-methylenedioxymethamphetamine (MDMA). This compound is abused for its central nervous system stimulant and hallucinogenic properties. Illicit forms of the drug have been found containing 50 to 250 mg of the substance as the hydrochloride salt and can be used either orally or by injection. Occasionally these preparations contain related substances such as MDMA. In addition to being used itself as a drug of abuse, MDA is a metabolite of MDMA.

    Overdose with MDA may result in agitation, tremor, tachycardia, rapid breathing, dilated pupils, increased body temperature, muscular rigidity, convulsions and coma.

21. MDMA (3,4-Methylenedioxymethamphetamine; Ecstasy) - Hair:

    3,4-Methylenedioxymethamphetamine (MDMA) is a DEA Schedule I controlled substance and is a synthetic sympathomimetic compound with mixed stimulant, psychotropic, and hallucinogenic activities. It was used briefly as an adjunct to psychotherapy, but because of widespread abuse it has now been reclassified as a DEA Schedule I compound. It has been most commonly administered orally, in doses between 100 and 150 mg, as the hydrochloride salt. An administration of 200 mg MDMA produced visual hallucinations, confusion agitation, coma, and hypotension.

22. Methadone (Dolophine®) - Hair:

    Methadone is a DEA Schedule II narcotic analgesic used in the treatment of opiate addiction and in the treatment of pain. Major metabolites of methadone include EDDP and EMDP.

23. Methamphetamine - Hair:

    d-Methamphetamine is a DEA schedule II stimulant drug capable of causing hallucinations, aggressive behavior and irrational reactions. Chemically, there are two forms (isomers) of methamphetamine: l- and d-methamphetamine. The l-isomer is used in non-prescription inhalers as a decongestant and has weak CNS-stimulatory activity. The d-isomer has been used therapeutically as an anorexigenic agent in the treatment of obesity and has potent CNS-, cardiac- and circulatory-stimulatory activity. Amphetamine and norephedrine (phenylpropanolamine) are metabolites of methamphetamine. d-Methamphetamine is an abused substance because of its stimulatory effects and is also addictive.

    High doses of methamphetamine can also elicit restlessness, confusion, hallucinations, circulatory collapse and convulsions.

    *In this case, the level of methamphetamine determined has not been differentiated according to its isomeric forms.

24. Midazolam (Versed®) - Hair:

    Midazolam is usually utilized for preoperative sedation, as a sedative hypnotic, and as an agent for the induction of anesthesia.

25. Morphine - Hair:

    Morphine is a DEA Schedule II narcotic analgesic. In analgesic therapy, it is usually encountered as the parent compound, however, it is also commonly found as the metabolite of codeine and heroin. In illicit preparations from which morphine may arise, codeine may be present as a contaminant. A large portion of the morphine is bound to the blood proteins or is conjugated; that which is not bound or conjugated is termed 'free morphine'. Hydromorphone is a reported metabolite of morphine.

    In general, free morphine is the active biologic agent. Morphine has diverse effects that may include analgesia, drowsiness, nausea and respiratory depression. 6-monoacetylmorphine (6-MAM) is the 6-monoacetylated form of morphine, which is pharmacologically active. It is commonly found as the result of heroin use.

26. Nordiazepam - Hair:

    Nordiazepam is a pharmacologically active metabolite of several benzodiazepine anxiolytic/sedative/hypnotic agents such as diazepam, chlordiazepoxide and clorazepate.

27. Oxazepam (Serax®) - Hair:

    Oxazepam may be given as a primary medication for the short-term relief of symptoms of anxiety and in the management of alcohol withdrawal. It is frequently seen as the metabolite of diazepam and other benzodiazepines.

Reference Comments:

28. Oxycodone (OxyContin®; Roxicodone®) - Hair:

    Oxycodone is a DEA Schedule II controlled semi-synthetic narcotic analgesic. It is used to control pain associated with such ailments as bursitis, injuries, simple fractures and neuralgia. The addiction liability of oxycodone is about the same as for morphine. This compound should be administered in the smallest effective dose and as infrequently as possible. The usual adult dose of the hydrochloride salt is 5 mg every 6 hr.

    In overdose, oxycodone can produce stupor, coma, muscle flaccidity, severe respiratory depression, hypotension and cardiac arrest.

29. Oxymorphone (Numorphan®; Opana®; Oxycodone Metabolite) - Hair:

    Oxymorphone is a semisynthetic opioid analgesic. It is indicated for use in the relief of moderate to severe pain and as a preanesthetic medication. The compound may be administered by injection or by mouth. Oral preparations are available as immediate-release tablets (5 or 10 mg) and as extended-release tablets (5 to 40 mg). Oxymorphone is also a pharmacologically active metabolite of oxycodone.

    Adverse effects of oxymorphone are typical of the opioid group of compounds.

30. Phencyclidine (Angel Dust; PCP; Sherm) - Hair:

    Phencyclidine (PCP) is a DEA Schedule II controlled dangerous hallucinogenic drug.

    The physiological effects of PCP can be classified as low or high dose. In low doses, PCP can elicit visual disturbances, drowsiness, agitation, hallucinations, aggressiveness, increased pulse rate and blood pressure, bronchospasm, increased respiratory rate and hyperthermia. In high doses, PCP can elicit convulsions, opisthotonos, coma, arrhythmias, decreased blood pressure and respirations and rhabdomyolysis.

31. Secobarbital (Seconal®) - Hair:

    Secobarbital is a DEA Schedule II sedative/hypnotic depressant barbiturate with a short duration of action. It is used therapeutically to induce sleep in the treatment of insomnia as well as for its sedative actions.

32. Temazepam (Normison®; Restoril®) - Hair:

    Temazepam is used in the short-term relief of insomnia. Its major metabolite, oxazepam, is also a pharmacologically active depressant. Temazepam is also a metabolite of diazepam.

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.

Acode 5900H - Cocaine and Metabolites Confirmation (Qualitative), Hair

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

Compound	Rpt. Limit	Compound	Rpt. Limit
Benzoylecgonine	500 ng/g	Cocaine	200 ng/g
Cocaethylene	200 ng/g		

Acode 5901H - Opiates Confirmation (Qualitative), Hair

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

Compound	Rpt. Limit	Compound	Rpt. Limit
6-Monoacetylmorphine	50 ng/g	Hydromorphone	50 ng/g
Codeine	50 ng/g	Morphine	50 ng/g
Dihydrocodeine / Hydrocodol	50 ng/g	Oxycodone	50 ng/g
Hydrocodone	50 ng/g	Oxymorphone	50 ng/g

Acode 5902H - Phencyclidine Confirmation (Qualitative), Hair

Analysis Summary and Reporting Limits:

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

Compound	Rpt. Limit	Compound	Rpt. Limit
Phencyclidine	10 ng/g		

Acode 5903H - Amphetamines Confirmation (Qualitative), Hair

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

Compound	Rpt. Limit	Compound	Rpt. Limit
Amphetamine	10 ng/g	MDMA	10 ng/g
MDA	10 ng/g	Methamphetamine	10 ng/g
MDEA	10 ng/g		

Acode 5904H - Barbiturates Confirmation (Qualitative), Hair

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

Compound	Rpt. Limit	Compound	Rpt. Limit
Amobarbital	2.0 mcg/g	Pentobarbital	2.0 mcg/g
Butabarbital	2.0 mcg/g	Phenobarbital	2.0 mcg/g
Butalbital	2.0 mcg/g	Secobarbital	2.0 mcg/g

Acode 5905H - Benzodiazepines Confirmation (Qualitative), Hair

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

Compound	Rpt. Limit	Compound	Rpt. Limit
7-Amino Clonazepam	10 ng/g	Lorazepam	10 ng/g
Alpha-Hydroxyalprazolam	10 ng/g	Midazolam	10 ng/g
Alprazolam	10 ng/g	Nordiazepam	40 ng/g
Chlordiazepoxide	40 ng/g	Oxazepam	40 ng/g
Clonazepam	4.0 ng/g	Temazepam	40 ng/g
Diazepam	40 ng/g		

Acode 5907H - Methadone Confirmation (Qualitative), Hair

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

Compound	Rpt. Limit	Compound	Rpt. Limit
Methadone	40 ng/g		

Acode 6946H - Drugs of Abuse Screen (9 Panel), Hair

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

Compound	Rpt. Limit	Compound	Rpt. Limit
Amphetamines	500 ng/g	Methamphetamine / MDMA	500 ng/g
Barbiturates	0.30 mcg/g	Opiates	200 ng/g
Benzodiazepines	300 ng/g	Oxycodone / Oxymorphone	100 ng/g
Cocaine / Metabolites	500 ng/g	Phencyclidine	300 ng/g
Methadone / Metabolite	500 ng/g		