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

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2018-1101
VSCSD

Toxicology Report

Report Issued 01/10/2019 08:01

To: **10217**
Saginaw County Medical Examiner's Office
Attn: Kanu Virani, M.D.
[redacted]
Saginaw, MI 48602

Patient Name [redacted]
Patient ID
Chain
Age 83 Y **DOB** [redacted]
Gender Male
Workorder [redacted]

Positive Findings:

Compound	Result	Units	Matrix Source
Caffeine	Positive	mcg/mL	001 - Peripheral Blood
Phenobarbital	5.3	mcg/mL	001 - Peripheral Blood
Phenytoin	1.9	mcg/mL	001 - Peripheral Blood

See Detailed Findings section for additional information

Testing Requested:

Analysis Code	Description
8052B	Postmortem, Expanded, Blood (Forensic)

Specimens Received:

ID	Tube/Container	Volume/ Mass	Collection Date/Time	Matrix Source	Miscellaneous Information
001	Gray Top Tube	10.5 mL	12/31/2018 08:30	Peripheral Blood	
002	Gray Top Tube	9.25 mL	12/31/2018 08:30	Peripheral Blood	

All sample volumes/weights are approximations.

Specimens received on 01/03/2019.

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CONFIDENTIAL **Workorder** [redacted]
Chain
Patient ID

Detailed Findings:

Analysis and Comments	Result	Units	Rpt. Limit	Specimen Source	Analysis By
Caffeine	Positive	mcg/mL	0.20	001 - Peripheral Blood	LC/TOF-MS
Phenobarbital	5.3	mcg/mL	0.50	001 - Peripheral Blood	GC/MS
Phenytoin	1.9	mcg/mL	0.50	001 - Peripheral Blood	HPLC

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. Caffeine (No-Doz) - Peripheral Blood:

   Caffeine is a xanthine-derived central nervous system stimulant. It also produces diuresis and cardiac and respiratory stimulation. It can be readily found in such items as coffee, tea, soft drinks and chocolate. As a reference, a typical cup of coffee or tea contains between 40 to 100 mg caffeine.

   The reported qualitative result for this substance was based upon a single analysis only. If confirmation testing is required please contact the laboratory.

2. Phenobarbital (Luminal®) - Peripheral 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.

3. Phenytoin (Dilantin®) - Peripheral Blood:

   Phenytoin is an anticonvulsant agent due to its CNS-depressant effects, Phenytoin is used alone or adjuvantly with other more potent anticonvulsants in a regimen to control epilepsy. The drug is generally given in oral daily doses of 300 to 400 mg; it may, however, also be given by the IV or IM route for acute seizure problems.

   Following administration of a single 100 mg oral dose, peak serum concentrations of phenytoin of 2 - 3 mcg/mL were reported 2 to 4 hr after administration. During chronic phenytoin treatment with 300 to 400 mg phenytoin daily, plasma concentrations averaged 8 - 18 mcg/mL. The range for desirable therapeutic results with phenytoin is 10 - 20 mcg/mL.

   In a reported fatality due to phenytoin a blood level of 45 mcg/mL was reported 80 hr after an acute overdose; the antemortem level was 94 mcg/mL 24 hr after ingestion.

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

Unless alternate arrangements are made by you, the remainder of the submitted specimens will be discarded one (1) year from the date of this report; and generated data will be discarded five (5) years from the date the analyses were performed.

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Workorder [redacted]
Chain
Patient ID

Workorder 19001544 was electronically signed on 01/10/2019 07:45 by:

[redacted]

Paul Miller,
Certifying Scientist

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 50011B - Barbiturates Confirmation, Blood - Peripheral Blood

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

Compound	Rpt. Limit	Compound	Rpt. Limit
Amobarbital	0.20 mcg/mL	Pentobarbital	0.20 mcg/mL
Butabarbital	0.20 mcg/mL	Phenobarbital	0.50 mcg/mL
Butalbital	0.20 mcg/mL	Secobarbital	0.20 mcg/mL

Acode 52105B - Phenytoin Confirmation, Blood - Peripheral Blood

-Analysis by High Performance Liquid Chromatography (HPLC) for:

Compound	Rpt. Limit	Compound	Rpt. Limit
Phenytoin	0.50 mcg/mL		

Acode 8052B - Postmortem, Expanded, Blood (Forensic) - Peripheral Blood

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

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

-Analysis by Headspace Gas Chromatography (GC) for:

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

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