OAKLAND COUNTY MICHIGAN
MEDICAL EXAMINER

OAKLAND COUNTY EXECUTIVE DAVID COULTER

Ljubisa J. Dragovic, M.D., Chief Forensic Pathologist
(248) 858-5097 | dragoviclj@oakgov.com

AUTOPSY PROTOCOL

NAME OF DECEASED: **DAKOTA LUIS HERRERA**

CASE NUMBER: 23-5589

GENDER: Male **AGE:** 27 Years **RACE:** American Indian/Hispanic

DATE OF DEATH: August 25, 2023 **TIME:** Unknown

PLACE OF DEATH: Dwelling

DATE PRONOUNCED: August 25, 2023 **TIME:** 7:43 A.M.

PLACE PRONOUNCED: Highland Township

DATE OF AUTOPSY: August 26, 2023 **TIME:** 8:00 A.M.

CAUSE OF DEATH: **MITRAGYNINE INTOXICATION**

MANNER OF DEATH: **UNDETERMINABLE**

1200 North Telegraph Road | Building 28 East | Pontiac, MI 48341-0438 | Fax (248) 452-9173 | www.oakgov.com

EXTERNAL EXAMINATION

The body clad in a navy color t-shirt, green cargo pants, grey underwear briefs and black socks only is that of a 5'4", 141 pounds, with the abdominal girth of 30", medium developed, slim-nourished Hispanic male reported to be 27 years of age. Rigor mortis is fully developed in the cold body and livor mortis is dorsally distributed and fixed. The scalp hair is dark brown and measuring up to 27" in length. The scalp is without note. Facial hair consists of a sparse mustache and goatee. The irides are brown, the corneae are cloudy and the sclerae and conjunctivae are unremarkable. The earlobes are pierced once, bilaterally, and the external ear canals are free of foreign material or abnormal secretions. The nostrils contain blood-tinged purge and the nasal skeleton is palpably intact. The lips are without evident injury. Natural dentition is present in the upper and lower jaw. The oral cavity contains a small amount of blood-tinged purge. The neck is symmetrical and features tattoos which are also present on the front aspect of the chest, bilaterally and throughout the body. The belly is flat. The external genitalia are those of a circumcised adult male type. There are multiple small scars in the right and left lower chest areas and upper belly areas. The posterior torso and anal orifice are without note. The upper and lower extremities feature multiple tattoos. There is no external evidence of significant recent trauma.

INTERNAL EXAMINATION

HEAD: The scalp is reflected after making the usual intermastoid incision and is free of subcutaneous and subgaleal hemorrhage. The calvarium is intact. The external meninges are unremarkable, without epidural or subdural hemorrhage. The 1,324 grams brain is covered by transparent leptomeninges and the cerebrospinal fluid is clear. The arterial

HEAD (cont'd): vessels at the base of the brain pursue their usual anatomic courses and are patent. Old or recent traumatic lesion or other abnormality is not evident externally or on serial coronal sectioning in the fresh state. Transverse sectioning of the brainstem and parasagittal sectioning of the cerebellum reveal no abnormality. The bones at the base of the skull are without evidence of fracture.

NECK: There is no evidence of injury to the soft tissues or bony structures of the neck. The laryngeal cartilages, the hyoid bone and the cervical spine are intact. The lumen of the larynx and trachea contains frothy fluid admixed with regurgitated gastric contents. The mucosa is without note.

BODY CAVITIES: The body cavities are entered in the usual manner. There are bilateral fibrous pleural adhesions that are patchily involving the lungs. The peritoneal cavity is without note. The organs are in their usual anatomic locations except for the surgically absent appendix. The lungs are expanded. There is no internal evidence of blunt force or penetrating injury to the thoraco-abdominal region.

CARDIOVASCULAR SYSTEM: The 326 grams heart has a smooth epicardium surface and unremarkable myocardium, endocardium and heart valves. The left ventricle myocardium measures 1.1 cm in thickness and the right ventricle myocardium measures 0.2 cm in thickness. No focal lesion is identified. The tricuspid valve circumference is 12 cm, the pulmonic valve circumference is 8 cm, the mitral valve circumference is 11 cm and the aortic valve circumference is 6 cm. The coronary ostia are patent and the coronary arteries show no significant compromise of their lumina. The aorta and its major branches

CARDIOVASCULAR SYSTEM (cont'd): are without note. The venae cavae and pulmonary arteries are free of antemortem thrombus.

RESPIRATORY TRACT: The right lung weighs 940 grams and the left lung weighs 827 grams. Their pleural surfaces are smooth except in the areas of the above mentioned focal fibrous adhesions present. There is mild subpleural anthracosis. The parenchyma is markedly congested and edematous, oozing copious amounts of frothy fluid from cut surfaces. The bronchi and their major branches contain frothy, blood-tinged fluid.

LIVER, BILIARY TRACT, SPLEEN, PANCREAS AND LYMPH NODES: The 1,556 grams liver has a smooth capsular surface with sharp anterior margins. The parenchyma is congested but unremarkable. The gallbladder contains approximately 20 mL of bile and the bile passages are patent. The pancreas is without external or sectioned abnormality. The 210 grams spleen has an intact capsule and congested parenchyma. There are prominent portal lymph nodes. The lymph nodes of the chest and belly cavities are otherwise without note. The 25 grams thymus gland is unremarkable.

GENITO-URINARY SYSTEM: The right kidney 94 weighs grams and the left kidney weighs 103 grams. Their capsules strip with ease to reveal smooth cortical surfaces. On sectioning there is good cortico-medullary definition and the calyces, pelves and ureters are unremarkable. The urinary bladder contains approximately 120 mL of urine. The mucosa is without gross lesion. The prostate gland is of the usual size and consistency.

GASTRO-INTESTINAL TRACT: The tongue is without evident recent injury. The pharynx and esophagus are unremarkable. The stomach contains approximately 40 mL of

GASTRO-INTESTINAL TRACT (cont'd): dark brown fluid without identifiable solid food particles. The mucosa is without note. The duodenum and remainder of the small and large bowels are without evident abnormality. The appendix is surgically absent.

ENDOCRINE SYSTEM: The thyroid, the pituitary and the adrenal glands are unremarkable.

MUSCULOSKELETAL SYSTEM: The skeletal muscle is firm and without note. The long bones of the extremities, the bony thorax, the bony pelvis and the vertebral column are without evidence of fracture.

DIAGNOSIS:

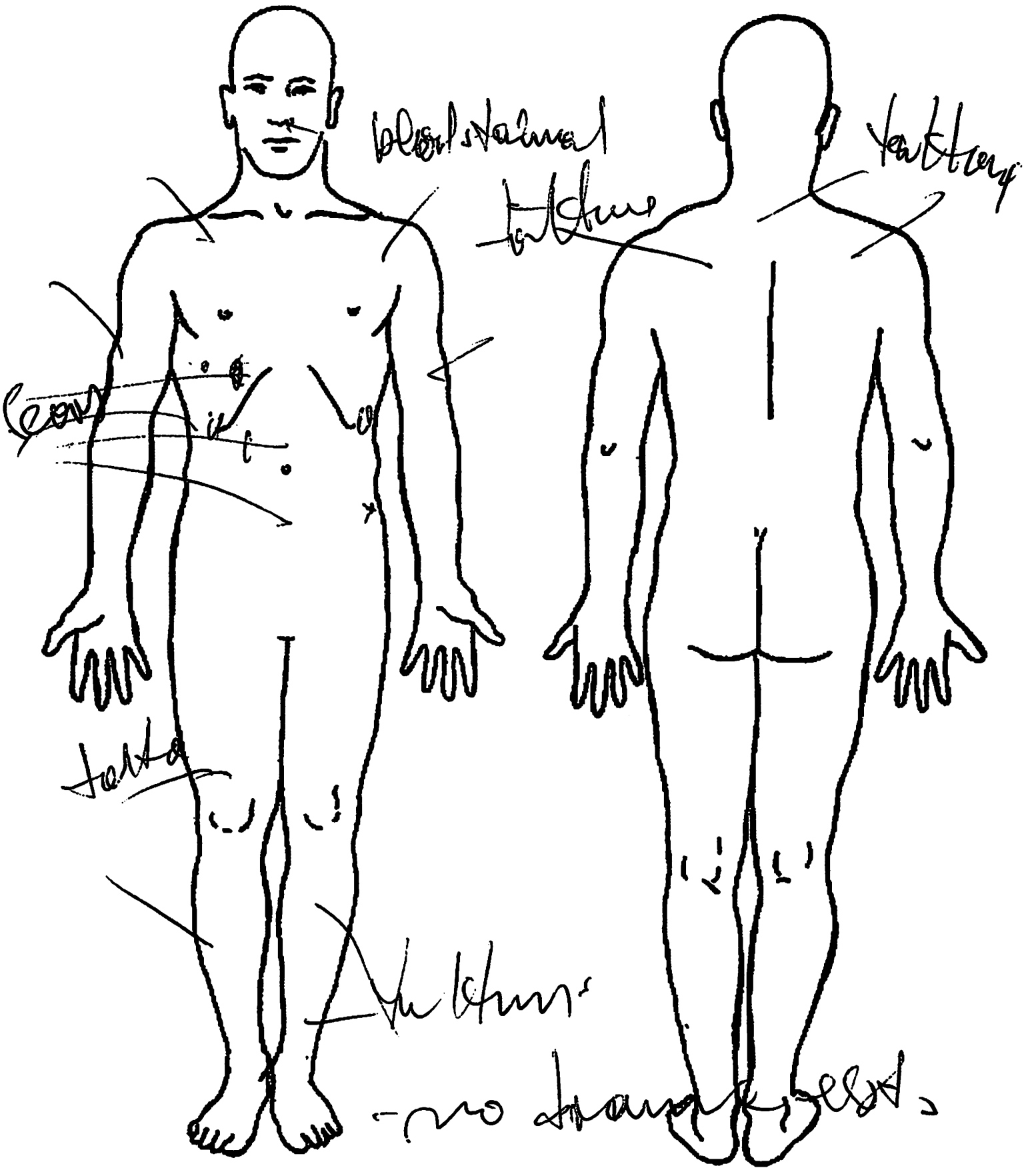
I. Mitragynine Intoxication
   A. Pulmonary congestion and edema

OPINION: This 27-year-old Hispanic male, Dakota Herrera, died of mitragynine intoxication. There was no evidence of other trauma or a pre-existing disease. In consideration of the circumstances surrounding this death, the results of this postmortem examination and the results of the toxicological analyses, the manner of death is undeterminable.

L. J. DRAGOVIC, M.D.
CHIEF MEDICAL EXAMINER

dmk

NAME: Dakota Herrera **CASE #:** 23-5589



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TOXICOLOGY REPORT

NAME: **DAKOTA HERRERA**
CASE # **23-05589**

VOLATILE SCREEN

INCLUDES: ACETONE, ETHYL ALCOHOL, ISOPROPYL ALCOHOL

REPORT: **FEMORAL BLOOD – None detected**

VITREOUS – None detected

FEMORAL BLOOD DRUG SCREEN*

INCLUDES: ACETAMINOPHEN, AMPHETAMINE, BARBITURATES, BENZODIAZEPINES, CANNABINOIDS, CARISOPRODOL, COCAINE/COCAINE METABOLITES, FENTANYL, FLUOXETINE, METHADONE, METHAMPHETAMINE, METHYLPHENIDATE, OPIATES, OXYCODONE/OXYMORPHONE, SALICYLATES, TRICYCLIC ANTIDEPRESSANTS

REPORT: **Cannabinoids detected**

SERUM DRUG SCREEN*

INCLUDES: CARBAMAZEPINE, PHENYTOIN, VALPROIC ACID

REPORT: **None detected**

URINE DRUG SCREEN*

INCLUDES: AMPHETAMINE/METHAMPHETAMINE, BARBITURATES, BENZODIAZEPINES, CANNABINOIDS, COCAINE/COCAINE METABOLITES, METHADONE, OPIATES, PHENCYCLIDINE

REPORT: **Cannabinoids detected**

DATE: 08/31/2023

9-18-23

DANIEL S. ISENSCHMID, PH.D., F-ABFT
FORENSIC TOXICOLOGIST, FOR NMS LABS

dmt

*This is an unconfirmed screen. Confirmation by a more definitive technique such as GC/MS is recommended.

NMS LABS

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

CONFIDENTIAL

Toxicology Report

Report Issued 09/15/2023 10:11

To: **10062**
Oakland County Medical Examiner
Attn: Toxicology
1200 N Telegraph Rd-Bldg 28 E
Pontiac, MI 48341

Patient Name	HERRERA, DAKOTA
Patient ID	23-05589
Chain	NMSCP288310
DOB	01/09/1996
Sex	Male
Workorder	23340529

Positive Findings:

Analyte	Result	Units	Matrix Source
Caffeine	**Presump Pos**	**mcg/mL**	**001 - Femoral Blood**
11-Hydroxy Delta-9 THC	**4.1**	**ng/mL**	**001 - Femoral Blood**
Delta-9 Carboxy THC	**18**	**ng/mL**	**001 - Femoral Blood**
Delta-9 THC	**16**	**ng/mL**	**001 - Femoral Blood**
Mitragynine	**290**	**ng/mL**	**001 - Femoral Blood**

See Detailed Findings section for additional information

Testing Requested:

Test	Test Name
8062B	Postmortem, Expanded w/o Alcohol, Blood (Forensic)

Specimens Received:

ID	Tube/Container	Volume/ Mass	Collection Date/Time	Matrix Source	Labeled As
001	Gray Stopper Glass Tube	7.75 mL	08/26/2023	Femoral Blood	23-05589 A

All sample volumes/weights are approximations.
Specimens received on 09/01/2023.

Detailed Findings:

Analysis and Comments	Result	Units	Rpt. Limit	Specimen Source	Analysis By
Caffeine	Presump Pos	mcg/mL	0.20	001 - Femoral Blood	LC/TOF-MS
This test is an unconfirmed screen. Confirmation by a more definitive technique such as GC/MS is recommended.					
11-Hydroxy Delta-9 THC	4.1	ng/mL	1.0	001 - Femoral Blood	LC-MS/MS
Delta-9 Carboxy THC	18	ng/mL	5.0	001 - Femoral Blood	LC-MS/MS
Delta-9 THC	16	ng/mL	0.50	001 - Femoral Blood	LC-MS/MS
Mitragynine	290	ng/mL	50	001 - Femoral 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. 11-Hydroxy Delta-9 THC (Active Metabolite) - Femoral Blood:

   11-hydroxy-THC is a psychoactive THC metabolite. 11-OH-THC was detectable in blood, with a 0.5 ng/mL cutoff, for 1.5 hours (range: 0.25-3.5) when cannabis was smoked by occasional users. 11-OH-THC may be present over 72 hours in chronic, frequent cannabis users.

   In occasional cannabis users, median (range) peak blood concentrations after smoking of 6.9% (50 mg) THC were 1.9 (0.5-8.7) ng/mL with median times of maximum concentrations at approximately 11 minutes. In chronic, frequent cannabis users, median (range) peak blood concentrations after smoking 6.9% THC were 7.2 (1.9-30.9) ng/mL, with median times of maximum concentrations at approximately 12 minutes. Usual peak levels are less than 10% of THC levels after smoking.

2. Delta-9 Carboxy THC (Inactive Metabolite) - Femoral Blood:

   Delta-9 THC is the principle psychoactive ingredient of marijuana/hashish. Delta-9 carboxy THC (THCC) is the inactive metabolite of THC. The usual peak concentrations in serum for 1.75% or 3.55% THC marijuana cigarettes are 10-101 ng/mL attained 32 to 240 minutes after beginning smoking, with a slow decline thereafter. The ratio of whole blood concentration to plasma concentration is unknown for this analyte. THCC 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. THCC is usually not detectable after passive inhalation.

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

   Delta-9 THC is the principle psychoactive ingredient of marijuana (cannabis, hashish). It is also the active component of the prescription medication Marinol®. Marijuana use causes relaxation, distorted perception, euphoria and feelings of well being, along with confusion, dizziness, somnolence, ataxia, speech difficulties, lethargy and muscular weakness.

   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. 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. Whole blood THC concentrations are typically half those in a corresponding plasma sample.

4. Mitragynine (Kratom) - Femoral Blood:

   Mitragynine is an alkaloid found in the plant Kratom which originates from Asia and is considered an atypical opioid agonist. The leaves of the plant are traditionally chewed or brewed into a tea, however, Kratom powders and leaf extracts are also sold and may be subject to abuse. The effects of Kratom are dose dependent, with lower doses resulting in stimulant-type effects and higher doses resulting in opioid-type effects. Reported adverse effects include seizures, psychosis, and liver toxicity.

   Over a 27 month-period, mitragynine was reported in 1001 blood specimens submitted during the course of medicolegal investigations; concentrations ranged from 5.6-29,000 ng/mL. In three cases which ruled mitragynine as the sole drug in the cause of death, postmortem peripheral blood concentrations ranged from 1590-3420 ng/mL.

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.

Workorder 23340529 was electronically signed on 09/15/2023 09:53 by:

Jennifer L. Swatek, M.S.F.S., D-ABFT-FT
Forensic Toxicologist

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 52198B - Cannabinoids Confirmation, Blood - Femoral 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 THC	0.50 ng/mL
Delta-9 Carboxy THC	5.0 ng/mL		

Test 52495B - Mitragynine Confirmation, Blood - Femoral Blood

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

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Mitragynine	50 ng/mL		

Test 8062B - Postmortem, Expanded w/o Alcohol, Blood (Forensic) - Femoral Blood

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

Analyte	Rpt. Limit	Analyte	Rpt. Limit
Barbiturates	0.040 mcg/mL	Gabapentin	5.0 mcg/mL
Cannabinoids	10 ng/mL	Salicylates	120 mcg/mL

-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.