

AMENDED
AUTOPSY REPORT

NAME: ELIJAH MCCLAIN

ME#: A19-02434

**DATE AND TIME PRONOUNCED
(BRAIN DEAD):**

August 27, 2019 / 1551 Hours

DATE AND TIME OF AUTOPSY: September 3, 2019 / 1000 Hours

AGE: 23

RACE: African American

GENDER: Male

CIRCUMSTANCES OF DEATH

This 23-year-old male went unresponsive immediately following a police involved interaction. CPR was initiated and he was transported to a local hospital. Imaging studies of the brain showed decreased ventricular size and anoxic brain injury. Imaging studies of the neck were negative and studies of the heart showed a small left ventricle with an ejection fraction of 25.3%. Laboratory tests showed a peak troponin of 2.12 ng/mL. He developed acute kidney injury in the hospital which was addressed but he had a second cardiac arrest on August 25, 2019 at 0300 Hours. Following brain death the decedent became an organ donor. Toxicology at the time of his admission was positive for cannabinoids. A review of his record shows that he was hospitalized in 2016 for LSD intoxication with hyperactive and erratic behavior. His medical history included asthma.

IDENTIFICATION

The decedent was identified by his mother who was present in the hospital and by Morpho scan.

CIRCUMSTANCES OF POSTMORTEM EXAMINATION

The autopsy was authorized by the Coroner of Adams County, Colorado. Prosecuting was Dr. Stephen J. Cina and assisting was Chief Coroner Monica Broncucia-Jordan. The autopsy was performed at the Adams County Coroner's Office. Also in attendance were two representatives each from Aurora PD and from the District Attorney's Office.

CLOTHING AND PERSONAL EFFECTS

The decedent was received unclad.

EXTERNAL EXAMINATION

The body was that of a well-developed, well-nourished, African American male. The body bag was sealed with a piece of yellow plastic bearing the numbers 7116098. Hospital and donor identification bands were on the right wrist and left ankle. The body weighed 140 pounds, was 67-inches in height and appeared compatible with the reported age of 23 years.

The body was cool. Full rigor mortis was present to an equal degree in all extremities. Mild, fixed purple lividity was distributed over the posterior surfaces of the body, except in areas exposed to pressure.

The scalp hair was black, kinky and 1/2-inch in length. Facial hair consisted of a scant mustache and a few hairs on the chin. The irides were brown, the corneae were clear, the sclerae were slightly icteric with two 1 mm petechiae on the left, and the conjunctivae were tan and free of petechiae. The external auditory canals, external nares, and oral cavity were free of foreign material and abnormal secretions. The earlobes were bilaterally pierced. There were no transverse creases of the lower pinnae. The nasal skeleton was palpably intact. The teeth were in good repair.

Examination of the neck revealed no evidence of injury. A sutured incision extended from the manubrium to the pubis. The abdomen was flat. No healed surgical scars were noted.

The extremities showed no gross bony deformities or pitting edema. The fingernails were intact. Tattoos were across the upper chest, on the bilateral forearms, on the right upper arm and on the left side of the neck. Needle tracks were not observed.

The external genitalia were those of a circumcised adult male. Only one testis was palpable in the scrotum (confirmed by internal examination). The anus was atraumatic.

EVIDENCE OF THERAPY

Evidence of medical intervention consisted of a venipuncture site with an associated purple/red ecchymosis covered by gauze in the left antecubital fossa; a tied Foley catheter; a blood pressure cuff on the left upper arm; endotracheal and nasogastric tubes; a pillow wrapped around the head with tape; intravenous catheters in the left internal jugular region and right antecubital fossa; a right radial arterial line; a pulse oximeter on the right second finger; and EKG leads on the right flank, bilateral posterior shoulders (2 each), and left lateral chest (2).

EVIDENCE OF INJURY**HEAD AND NECK INJURIES:**

A 1 1/4-inch linear scabbed abrasion was between the eyebrows. A 1/8-inch scabbed abrasion was above the medial right eyebrow and a 3/16-inch scabbed abrasion was on the left side of the forehead. A 3/16-inch scabbed abrasion was lateral to the right eyebrow. A 5/8-inch linear scabbed abrasion was in the right preauricular region. A 1/2-inch scabbed abrasion was lateral to the left eyebrow. A faint 1/4-inch scabbed abrasion was over the left zygoma. A 3/16-inch scabbed abrasion was anterior to the right ear. A 1/2-inch faint scabbed abrasion was on the right side of the chin. A 3/16-inch scabbed abrasion was on the right side of the upper lip.

There were no injuries to the skull or brain and there was no intracranial bleeding.

There was a 6 1/2 x 1.8 cm zone of hemorrhage involving the fascia of the left sided deep strap muscles over the larynx. There was hemorrhage beneath the left sternocleidomastoid muscle in the region of an intravenous catheter. A layered anterior neck dissection showed no other hemorrhage in the strap muscles proper. The hyoid bone and larynx were intact.

THORACOABDOMINAL INJURIES:

There was a 5 1/2 x 3 1/2-inch zone of scabbed abrasions on the left side of the upper and mid back. A 6 x 5 1/2-inch zone of nonspecific scabbed abrasions was on the right side of the upper

back and mid back. A 7 x 1 1/2-inch zone of patterned scabbed abrasions was on the left side of the mid back/lower back. Three red 1/2 - 1/4-inch abrasions were on the right lateral chest. A 3/8-inch scabbed abrasion was on the anterior right shoulder.

The skin of the posterior torso was reflected revealing no hemorrhage into the musculature. The skin of the anterior torso was reflected revealing a 3 x 1 cm zone of hemorrhage on the right anterior chest wall.

There were no rib fractures or visceral injuries.

INJURIES TO EXTREMITIES:

Punctate scabbed abrasions were on the right pretibial region.

A 1-inch scabbed abrasion was on the posterior upper left thigh adjacent to a linear vesicle. A 1/2-inch scabbed abrasion was on the posterior right thigh.

A patterned 7 x up to 2-inch scabbed abrasion was on the posterior left lower leg. A 4 x 1 1/2-inch nonspecific, faint scabbed abrasion was on the posterior right thigh.

1/8-inch scabbed abrasions were on the palmar surface of the right 3rd and 4th fingers.

A 3/8-inch tram track scabbed abrasion was on the radial aspect of the left wrist.

There were no long bone fractures.

INTERNAL EXAMINATION

Body Cavities:

The body was opened by a modified thoracoabdominal incision and the previously incised chest plate was removed. Approximately 200 mL of serosanguinous fluid resided in each of the pleural cavities and the peritoneum. The organs shared one large cavity space status post procurement. The kidneys, adrenal glands, pancreas, liver and gallbladder had been surgically removed. The subcutaneous fat layer of the abdominal wall was 1 cm in thickness. There was marked soft tissue edema.

Head: (Central Nervous System)

The scalp was reflected. The calvarium of the skull was removed. The dura mater and falx cerebri were intact. There was no subdural or epidural hemorrhage. The leptomeninges were thin and delicate. The cerebral hemispheres were symmetrical, soft and pink/gray with diffuse edema characterized by flattening of the gyri and narrowing of the sulci. The structures at the base of the brain, including the cranial nerves and blood vessels, were intact. Coronal sections through the cerebral hemispheres revealed blurring at the gray/white junctions. The cerebellum had undergone liquefactive necrosis. There was mild Duret hemorrhage within the pons. The brain weighed 1,240 grams. The spinal cord was not removed.

Neck:

Hemorrhage into the soft tissues of the left side of the neck have been described above. The hyoid bone and larynx were intact.

Cardiovascular System:

The pericardial sac had been incised. The coronary arteries arose normally, followed the usual distribution, and were widely patent, however, the left anterior descending coronary artery had a maximum diameter of 1-2 mm. There was no superimposed thrombosis. The remaining portions of the aorta and vena cavae were unremarkable. The heart weighed 265 grams prior to fixation for subsequent dissection

Upon re-examination, the left anterior coronary artery was confirmed to be atrophic. The cardiac valves were unremarkable. The chambers and valves exhibited the usual size-position relationships. The myocardium was red/brown and firm with no focal lesions; the atrial and ventricular septae were intact. The conduction system appeared to be grossly intact.

Respiratory System:

The upper airway was clear of debris and foreign material; the mucosal surfaces were smooth, yellow/tan and unremarkable. The pleural surfaces were smooth and glistening with no focal lesions. The pulmonary parenchyma was tan/purple with focal "leopard spotting". The parenchyma of the upper lobe of the

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right lung was firm and diffusely purple. There was minimal anthracosis. No mass lesions were noted. The pulmonary arteries were normally developed, patent, and without thrombus or embolus. The right lung weighed 510 grams; the left lung weighed 400 grams.

Liver and Biliary System:

The liver had been procured.

Alimentary System:

The tongue exhibited no evidence of recent injury. The esophagus was lined by gray/white, smooth mucosa. The gastric mucosa was autolyzed and the lumen contained approximately 200 mL of thick, green liquid with identifiable beans. The small and large bowels were unremarkable. The pancreas had been procured. The appendix was present.

Genitourinary System:

The kidneys had been procured. The urinary bladder was empty; the mucosa was gray/tan and wrinkled with punctate erythema. The prostate gland was unremarkable. Only one testis could be identified within the scrotal sac.

Reticuloendothelial System:

The spleen had been biopsied. The remainder of the capsule was smooth and intact covering red/purple, moderately firm parenchyma; the lymphoid follicles were unremarkable. The regional lymph nodes appeared normal. The spleen weighed 70 grams.

Endocrine System:

The thyroid was unremarkable. The adrenal glands had been procured.

Musculoskeletal System:

Muscle development was normal. There was diffuse soft tissue edema. No bone or joint abnormalities were noted.

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SPECIMENS/EVIDENCE OBTAINED

Samples of admission blood, donor blood, peripheral blood, and vitreous fluid were obtained for toxicology.

A DNA card was retained for the file.

Samples of the major organs were submitted for stock in formalin.

Six cassettes were submitted initially for histologic analysis; 5 others followed.

The heart was fixed for subsequent dissection and examined by Dr. Cina on 9/11/19.

Eight additional cassettes were submitted by Dr. Roger Mitchell on 3/27/21.

MICROSCOPIC DESCRIPTION

A - Left anterior descending coronary artery: tangential section; unremarkable myocardium (note: recut is tangential but shows mild intimal hyperplasia)

B - Left lung: patchy hemorrhage; interstitial pneumonitis; atelectasis; intra-alveolar histiocytes; mild anthracosis; patchy hemorrhage; mildly sickled erythrocytes; intraluminal mucus and a few neutrophils; histiocytic response to foreign material

C - Right lung: patchy hemorrhage; interstitial pneumonitis; atelectasis; intra-alveolar histiocytes; mild anthracosis; giant cells with ingested foreign material; patchy edema; intrabronchial mucus with neutrophils; mildly sickled erythrocytes; thickened basement membranes with smooth muscle hyperplasia and increased eosinophils

D - Cerebellum: liquefactive necrosis; pyknotic, red neurons

E - Left temporal cortex: liquefactive necrosis; edema; pyknotic, red neurons

F - Left deep strap muscles: acute hemorrhage in fibrofatty tissue, muscle spared; benign thyroid tissue; iron stain negative

G - Anterior left ventricle: unremarkable

H - Interventricular septum: unremarkable

I - Right ventricle: unremarkable

J - SA nodal region: unremarkable

K - AV nodal region: unremarkable

L through N - Lungs: aspirated orogastric contents with foreign body giant cell response; interstitial pneumonitis; patchy hemorrhage; patchy atelectasis; very mild anthracosis; foci of basement membrane thickening; intraluminal mucus with neutrophils

O - Heart, posterior wall: very focal, mild myocyte hypertrophy

P - Heart, anterior wall: unremarkable

Q - Heart, septum: focal, minimal fibrointimal hyperplasia of subepicardial arteriole (note: septal sections should not contain epicardial adipose tissue)

R and S - Heart, lateral wall: rare mildly hypertrophic myocytes

PATHOLOGIC DIAGNOSES

- I. Superficial blunt force injuries
 - A. Nonspecific and patterned scabbed abrasions of torso, extremities and face
 - B. Tram track abrasion, left wrist
 - C. Rare scleral petechiae, left eye
 - D. Negative anterior neck dissection
 - E. No fractures or visceral injuries

- II. Pulmonary:
 - A. Acute and granulomatous interstitial pneumonitis
 - B. Giant cells with ingested foreign material including gastric contents
 - C. Acute bronchitis
 - D. Atelectasis
 - E. Mildly sickled erythrocytes (hemoglobin electrophoresis negative for Hgb S)
 - F. Chronic asthma

- III. Anoxic encephalopathy

- IV. Narrow left anterior descending coronary artery

- V. Acute hemorrhage in interstitial tissues of neck (strap muscles spared)

- VI. Status post organ donation

- VII. Toxicology (NMS Labs 19266069, hospital blood):
 - A. Ketamine = 1400 ng/mL
 - B. 11-Hydroxy Delta-9 THC = 4.9 ng/mL
 - C. Delta-9 Carboxy THC = 31 ng/mL
 - D. Delta-9 THC = 14 ng/mL
 - E. Urine positive for cannabinoids

AMENDED OPINION

The original autopsy report was signed on November 7, 2019. The cover sheet of that autopsy report stated that the opinions rendered were based on the information available at that time. Since then, this Office has received additional material for review including extensive body camera footage, witness statements, and additional records. It is worth noting that these materials had been requested prior to release of the initial autopsy report but the material was either not provided to us or not provided to us in their entirety. Having insufficient information as of November 7, 2019 was one of the reasons the cause and manner of death in this case were deemed UNDETERMINED. Additional material of relevance has also been generated through the grand jury investigation.

After review of all material available to us at this time, it is my opinion that this 23-year-old, African American male, Elijah McClain, died of COMPLICATIONS OF KETAMINE ADMINISTRATION FOLLOWING FORCIBLE RESTRAINT.

According to Baselt's *Disposition of Toxic Drugs and Chemicals in Man*, 8th edition, therapeutic ketamine levels in the serum and plasma range from 1.0-6.3 mg/L following a single intravenous administration. In a fatality following a 1000 mg IM injection, the blood ketamine level was 27 mg/L; the ketamine level in this case was 1.4 mg/L. The investigation suggests that the decedent in this case received an intramuscular dose of ketamine that was higher than recommended for his weight. Further, my review of all of the body camera footage shows that Mr. McClain was extremely sedated within minutes of receiving a shot of ketamine. When he was placed on a stretcher, I believe he was displaying agonal breathing and respiratory arrest was imminent. Simply put, this dosage of ketamine was too much for this individual and it resulted in an overdose, even though his blood ketamine level was consistent with a "therapeutic" blood concentration. I believe that Mr. McClain would most likely be alive but for the administration of ketamine.

A carotid control hold was applied during the decedent's restraint. I cannot determine whether this carotid control hold contributed to death via stimulation of the carotid sinus, though the literature suggests that this was unlikely. Further, this type of hold is often used in the martial arts with no lasting adverse consequences. There were no findings in the neck

indicative of traumatic asphyxiation. In addition, during restraint the body weight of officers was used to subdue the decedent. However after this weight was removed, the decedent was still alive and able to speak. I have seen no evidence that injuries inflicted by the police contributed to death.

Mr. McClain was likely under physiological and emotional stress during the course of his restraint. Physical exertion (e.g. struggling during restraint, intense exercise) may result in several metabolic abnormalities. These include lactic acidosis and fluctuations in catecholamines (e.g. adrenaline) and certain electrolytes. We do not know the levels of lactic acid, adrenaline, and electrolytes in Mr. McClain's blood while he was being restrained. I cannot rule out that metabolic abnormalities contributed to death, nor can I prove they did.

Just prior to ketamine administration he was moving his feet, groaning, making other noises, and made a type of growling noise when he was injected with ketamine. This shows that he was alive and responsive to painful stimuli prior to receiving this drug. It is my opinion that he likely would have recovered if he did not receive this injection. It should be noted that the vast majority of people who are restrained or who vigorously exercise and develop lactic acidosis and adrenaline surges do not die.

The investigation indicates Mr. McClain was a distance runner and showed no cardiac symptoms prior to death. This suggests that his small coronary artery was congenital and he likely had sufficient collateral circulation in his heart to provide enough oxygen to the heart muscle during intense physical exertion. For this reason I do not believe this small coronary artery contributed to death.

I believe this tragic fatality is most likely the result of ketamine toxicity. These deaths are usually classified as ACCIDENT. I do not have evidence of trauma or lethal asphyxiation during restraint sufficient to cause death. I do not know if bradycardia associated with carotid body stimulation or metabolic abnormalities associated with struggling during restraint contributed to death. Based on my training and experience, I still contend that the appropriate manner of death in this case is UNDETERMINED. I acknowledge that other reasonable forensic pathologists who have trained in other places may have developed their own philosophy regarding deaths

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in custody and that they may consider the manner of death in this type of case to be either HOMICIDE or ACCIDENT.

Lastly, it should be made clear that the manner of death is not a medical diagnosis and it is not determined by the autopsy. Rather, it is a construct of Vital Statistics designed to classify and track deaths based on the circumstances surrounding a fatality. In some cases the manner of death may be deemed HOMICIDE but criminal prosecution may not follow (e.g. self-defense). Conversely, certain cases with a manner of death of UNDETERMINED may warrant prosecution if the entire facts of the case indicate that this is appropriate.

REFERENCES

A Guide for Manner of Death Classification, 1st ed., February 2002, National Association of Medical Examiners (NAME).

Mitchell R, Diaz F, Goldfogel G, Fajardo M, Fiore S, et. al. NAME Position Paper: Recommendations for the definition, investigation, postmortem examination, and reporting of deaths in custody. *Acad Forensic Pathol.* 2017 7(4): 604-618.

Gill J, Girela-Lopez E. Manner of death for in-custody fatalities. *Acad Forensic Pathol.* 2015 5(3): 402-413.

Graham M. Investigation of deaths temporally associated with law enforcement apprehension. *Acad Forensic Pathol.* 2014 4(3): 366-389.



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July 1, 2021

Date

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