



OFFICE OF THE MEDICAL EXAMINER
701 W. Jefferson St.
Phoenix, AZ 85007

MEDICAL EXAMINER REPORT

DECEDENT: Christopher Alan Peebles MacKenzie

CASE: 13-04426

DATE OF EXAMINATION: 07/02/2013

TIME: 1007 Hours

PERSONS PRESENT AT EXAMINATION:

Lieutenant Tom Boelts (Yavapai County Sheriff's Office)
Jerry Payne, Deputy State Forester

PATHOLOGIC DIAGNOSES

- I. Fire-related injuries.
 - A. Thermal injuries.
 - 1. 42 percent total body surface area of full-thickness burns.
 - 2. 8 percent total body surface area of partial-thickness burns.
 - 3. Exposure of bone of bilateral lower extremities with calcining of the metatarsals of the right foot.
 - B. Inhalation of products of combustion.
 - A. See separate Toxicology Report
 - B. Cherry-red discoloration of musculature.
 - C. Soot in airways.
- II. No evidence of significant natural disease.
- III. See separate Toxicology Report.

CAUSE OF DEATH: Fire related injuries
MANNER: Accident

10/24/2013
Date Signed


CHRISTOPHER K. POULOS, MD
MEDICAL EXAMINER

CHRISTOPHER ALAN PEEBLES MACKENZIE

13-04426

CIRCUMSTANCES OF DEATH

On July 1, 2013, Yavapai County officials requested assistance from the Maricopa County Office of the Medical Examiner with the medicolegal death investigations of 19 firefighters who died in the Yarnell Hill wildfire on June 30, 2013. Under the Maricopa County Manager's authority and direction, the Maricopa County Office of the Medical Examiner examined the firefighters' remains for the purpose of forensic identification and postmortem evaluation. The Maricopa County Office of the Medical Examiner also agreed to provide consultative services to investigating authorities and the Yavapai County Medical Examiner. The Yavapai County Medical Examiner agreed it will certify the firefighters' death certificates. The following Maricopa County Office of the Medical Examiner case numbers were designated for this incident: 13-04425, 13-04426, 13-04427, 13-04428, 13-04429, 13-04430, 13-04431, 13-04432, 13-04433, 13-04434, 13-04435, 13-04436, 13-04437, 13-04438, 13-04439, 13-04440, 13-04441, 13-04442, and 13-04443.

The decedent was a 30-year-old male who was a firefighter involved in a wildfire.

EXTERNAL EXAMINATION

The body is received in a zippered body pouch secured by evidence seal 026521.

PHOTOGRAPHS:

Photographs are taken during the examination.

RADIOGRAPHS:

Radiographs reveal dental restorations, clothing in belt buckle with the engraving "Granite Mountain Hot Shots," laces and nails of boots and other equipment.

IDENTIFICATION:

The body is identified by family confirmation of distinctive tattoos on 7/2/2013.

CLOTHING AND PERSONAL EFFECTS

The body is clad in the items of clothing as detailed in the property inventory list: a fire-retardant pouch that is not covering the decedent's face (appears torn), the feet, or the right arm. This fire-retardant pouch is cut at the edge for removal of the pouch from the decedent's body. Additional clothing includes charred remnants of boots, a brown leather belt with a yellow-metal buckle bearing the previously described inscription, remnants of a sock, a helmet located off the body that is melted (Bullard brand) with a bandana inside the helmet, gloves without labels retained on the body, a wristwatch brand Suunto Core, a camp camouflage Buck brand knife, green pants size 30 x 34 short, brand Wild Wind firefighter protective (fastened with belt buckled). Within these

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pants in the left front pocket is a tube of Burt's Bees lip balm, a pack of Trident gum, and tobacco. In the left cargo pocket is an eyeglass cleaner brand Chums, a container of chewing tobacco, three books of matches, a purple lighter, an orange lighter, a Smith brand eyeglass cleaner, and a cellular telephone. Additional items present are a pair of camouflage underpants size medium, a yellow shirt labeled "shirt flame-resistant (Amarid) Terry Manufacturing" size large (buttoned). In the front pocket of the shirt is a Canon S1400IS camera (working), a compass within the left front pocket, a pen (Tracy Murr St. Farm) within the left front pocket, a Sharpie within the left front pocket, a glasses bag with a rescue-type reflecting mirror within the left front pocket. Also present are a black T-shirt with the logo "Granite Mountain Interagency Hot Shot Crew" and a leather holster for unknown type of tool.

EVIDENCE OF MEDICAL INTERVENTION

There is no evidence of recent medical intervention.

EVIDENCE OF TRAUMA

External thermal injuries

Partial thickness burns are identified on the posterior aspect of the left upper arm, the dorsal and ventral aspects of the forearms bilaterally and the superior portion of the back and nape of the neck. Full-thickness burns are identified on the posterior aspect of the left elbow, on the posterior aspect of the right upper arm with charring and exposure of the underlying muscle, on the majority of the back, on the posterior aspects of the thighs and lower legs, bilaterally, and on the anterior lower legs with charring and exposure of bone and burning and calcining of the metatarsals of the right foot with thermal-related fractures of the right foot. Relative sparing of the toes of the left foot is identified.

INTERNAL EVIDENCE OF INHALATION OF PRODUCTS OF COMBUSTION:

Internal examination of the body reveals pink-red discoloration of the skeletal muscle and soot throughout the decedent's airways.

Additional nonthermal-related injuries include a 1/4-inch red abrasion of the dorsum of the right hand.

SCARS, TATTOOS AND OTHER IDENTIFYING BODY FEATURES:

Include an approximately 1-inch irregular scar of the right side of the mid back, a complex leaf-type tattoo on the right arm involving an owl, a lighthouse, the name MacKinze and other illegible figures, a tattoo of a cartoon character in a trash can and the name "Hemet" in the anterior aspect of the right thigh, a tattoo of a skull and the word "Fiend" on the anterior aspect of the left thigh.

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GENERAL EXTERNAL EXAMINATION

The unembalmed body is that of a male 70 inches in height, weighing 242 pounds. Rigor mortis is generalized and livor mortis is cherry red, fixed and anterior. The body is cold. Evidence of postmortem change includes green discoloration of the face, purging of hemolyzed fluid from the mouth and nares, marbling of the skin. The scalp hair is brown, straight, and approximately 1 inch in length. The irides are of indeterminate coloration secondary to corneal clouding. There are no lesions of the sclerae or conjunctivae aside from heat-related artifacts. No petechial hemorrhages are identified on the sclerae, conjunctiva, or oral mucosa. The decedent wears a beard and mustache. The ears are unremarkable and appear to be unpierced. Dentition is natural and in good condition. The trachea is in the midline. The thorax is well developed and symmetrical. The abdomen is flat. There are no palpable intra-abdominal masses. The external genitalia are those of a normal appearing male with testes appearing to be bilaterally descended within the scrotum, and the penis appears to be uncircumcised. The extremities are well developed and symmetrical with no significant cyanosis, clubbing, edema or deformity (where intact). The fingernails are unremarkable. The feet and toes are remarkable for the previously described injuries but otherwise unremarkable. The posterior aspects of the torso are symmetrical and devoid of any acute injury patterns aside from the previously described thermal injury. General appearance is compatible with the reported age of years 30 years.

INTERNAL EXAMINATION

The body is opened by a standard Y-shaped thoracoabdominal incision. All viscera occupy their appropriate anatomic relationships. Serous surfaces are smooth and glistening throughout. There is approximately 50 mL of decomposition-related fluid within each pleural cavity; however, there are no additional fluid accumulations or adhesions within the other body cavities.

CARDIOVASCULAR SYSTEM

The heart weighs 400 grams. The heart occupies its usual mediastinal site. The external configuration is unremarkable. The epicardial surfaces are smooth and glistening. All major vessels arise in their appropriate anatomic relationships. The coronary arteries arise normally and are distributed in a left dominant pattern with no significant atherosclerotic stenosis. The myocardium is firm, red-brown without areas of softening, hemorrhage or gross scarring. No abnormal communications exist between the cardiac chambers. Ventricular thicknesses are: left 1.4 cm, right 0.5 cm, and 1.5 cm. in the interventricular septum. The cardiac valves have thin, pliable leaflets. The valve circumferences are appropriate to the caliber of the cardiac chambers. The valve cusps and surfaces are free of fusion or vegetations.

The aorta is of normal caliber with all major arterial branches arising in their appropriate anatomic relationship. Elasticity is normal. The intimal surfaces are smooth, without

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aneurysm formation or dissection. No systemic venous abnormalities or thrombi are present.

RESPIRATORY SYSTEM

The lungs weigh 750 grams, bilaterally. The upper and lower airways contain soot but are otherwise patent and of normal caliber. The pleural surfaces are smooth and glistening. The parenchyma is well expanded, light pink to dark red-purple, exuding moderate amounts of blood and frothy fluid. There are no areas of induration, consolidation, hemorrhage or gross scarring. The pulmonary vessels are patent and of normal caliber.

DIGESTIVE/HEPATOBIILIARY SYSTEM

The oropharynx is grossly normal and unobstructed. The esophagus is of normal caliber with a smooth, white mucosal lining. The gastroesophageal junction is well defined. The stomach has intact mucosal surfaces and the lumen contains 50 mL of light brown fluid with partially digested food fragments. No areas of ulceration, erosion, or hemorrhage or scarring are present. The small and large intestines are externally unremarkable and are without palpable masses or diverticula. The vermiform appendix is present. The lobular tan pancreas is firm, without areas of fat necrosis, gross hemorrhage or space-occupying lesions. The pancreatic ducts are patent and of normal caliber.

The 1400-gram liver has a smooth intact capsule, covering red-brown parenchyma. No localizing masses, lesions or areas of hemorrhage are evident on external or cut surfaces. The intrahepatic and extrahepatic ducts are patent and of normal caliber. The gallbladder contains viscid bile. The gallbladder mucosa is grossly normal.

GENITOURINARY SYSTEM

The symmetric kidneys weigh 150 grams, bilaterally. They are similar in size and shape. The capsules strip with ease from the smooth, red-brown cortical surfaces. The cortices are sharply delineated from the medullary pyramids. The calyces, pelves and ureters are unremarkable. The renal vessels are patent and of normal caliber.

The urinary bladder contains approximately 10 mL of clear dark yellow urine. The mucosal surfaces are flat and pink-tan. The prostate and seminal vesicles are unremarkable.

HEMATOPOIETIC SYSTEM

The 175-gram spleen occupies its usual anatomic site, with an intact, smooth and glistening capsule covering a red-purple, moderately firm, parenchyma. An accessory spleen is present. Regional lymph nodes have their usual distribution and appearance. Rib bone marrow is beefy, red, and unremarkable.

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ENDOCRINE SYSTEM

The thyroid and adrenal glands are grossly not remarkable.

NECK

The cervical spine is structurally intact. The hyoid bone and thyroid cartilage are intact. There are no hemorrhages in the strap muscles or soft tissues of the neck. The upper airway contains soot but is patent.

MUSCULOSKELETAL SYSTEM

The bony framework, supporting musculature and soft tissues are unremarkable except for the previously described thermal injuries.

NERVOUS SYSTEM

The scalp is reflected in the usual fashion. There are no contusions, lacerations, or abrasions. There is no skull fracture. The 1375-gram brain is covered by thin, clear, delicate leptomeninges. The dura mater and falx cerebri are intact. There is good preservation of cerebral symmetry without flattening of gyri or widening of sulci. Convolutional patterns remain intact. External landmarks are readily identified. There is no evidence of herniation or either diffuse or localized swelling. The cerebral vessels are intact with no evidence of aneurysm or thrombosis. Atherosclerotic changes are not identified. Multiple coronal sections of cerebrum, cerebellum, and brain stem reveal no localized hemorrhages, masses, or lesions. The ventricular system is symmetrical, non-dilated and filled with clear fluid. The basal ganglia are grossly normal. The atlanto-occipital articulation is grossly normal.

EVIDENCE

Includes a flame retardant pouch, one boot, one helmet, pants with belt, two gloves, and a yellow long-sleeve shirt size large.

TOXICOLOGY SPECIMENS

Samples of the following are collected and submitted for toxicological testing: gastric contents, psoas muscle, lung, liver, spleen, kidney, brain, nasal swabs, head hair, vitreous fluid, subcutaneous fat, iliac blood, cardiac blood, cavity blood, bile, and urine.

FINAL SUMMARY

Based on the autopsy findings and investigative history, as available to me, it is my opinion that Christopher Alan Peebles MacKenzie, a 30-year-old Caucasian male, died as a result of fire related injuries.

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The manner of death is accident.

CKP/hyf

D: 7/03/13

T: 7/03/13

The Maricopa County Medical Examiner's Office is required by statute (A.R.S. § 11-594(A)(2) and (4)) to certify the cause and manner of death following completion of the death investigation of each case over which it assumes jurisdiction, and to promptly execute a death certificate, on a form provided by the state registrar of vital statistics, indicating the cause and manner of death. The form provided by the state registrar of vital statistics includes five manners of death: homicide, suicide, accident, natural, and undetermined. The determination of manner of death is a forensic determination by the pathologist predicated upon the totality of all then-known forensic evidence and other circumstances surrounding the cause of death; it is not a legal determination of criminal or civil responsibility of any person(s) for the death.

Review
w/ 10/22/2013

MARICOPA COUNTY OFFICE OF THE MEDICAL EXAMINER
REPORT OF TOXICOLOGICAL EXAMINATION

Case Number: 13-04426
Decedent: CHRISTOPHER ALAN PEEBLES MACKENZIE
Date Submitted: 07/02/2013
Report Date: 07/26/2013

Specimens Collected: NASAL SWAB, KNOWN HEAD HAIR, VITREOUS,
SUBCUTANEOUS ADIPOSE TISSUE, ILIAC BLOOD, CARDIAC
BLOOD, CAVITY FLUID, BLOT/FILTER PAPER, BILE, URINE,
GASTRIC, PSOAS MUSCLE, LUNG TISSUE, LIVER, SPLEEN,
KIDNEY, BRAIN

Medical Examiner: CHRISTOPHER K. POULOS, MD

RESULTS*:

Vitreous: None detected for ethanol, methanol, isopropanol and acetone


Iliac Blood: Positive for
Ethyl alcohol 0.01 g% (trace amount)
None detected for methanol, isopropanol, acetone, amphetamine,
methamphetamine, phencyclidine, cocaine, benzoylcegonine,
methadone, morphine, codeine, benzodiazepines, barbiturates,
antihistamines, phenothiazines, tricyclic antidepressants, fentanyl,
oxycodone, and acid neutral drugs

Cardiac Blood: Positive for
Carboxyhemoglobin (18% saturation)

Brain and Lung: Positive by GC/MS for
Benzene
Toluene
Xylene

Urine: None detected for amphetamine, methamphetamine,
phencyclidine, cocaine, methadone, codeine, antihistamines,
phenothiazines, and tricyclic antidepressants

*If results are not listed for any specimen(s), that/those specimen(s) is/are deemed to be on "HOLD"


Norman A. Wade
Laboratory Director