



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

**MEDICAL EXAMINER REPORT**

**DECEDENT:** Grant Quinn McKee

**CASE:** 13-04437

**DATE OF EXAMINATION:** 07/02/2013

**TIME:** 08:13 Hours

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**PATHOLOGICAL DIAGNOSES**

- I. Smoke inhalation.
  - A. Thick soot deposition, oral cavity, nostrils, larynx and trachea.
  - B. Cardiac blood: Carboxyhemoglobin of 21% saturation.
- II. Thermal changes of upper and lower airways.
- III. Diffuse thermal burns.
- IV. Level I toxicology testing (see separate Toxicology Report).
  - A. Iliac blood: Positive for hydrocodone of 0.122 mg/L, presence of dihydrocodeine, presence of norhydrocodone, hydromorphone Of 0.002 mg/L, amphetamine of 0.12 mg/L, fluoxetine of 0.13 mg/L, presence of norfluoxetine, carisoprodol of <2 mg/L, meprobamate of <5 mg/L and acetaminophen of ~27 mg/L.
  - B. Vitreous humor: Negative for ethanol, methanol, isopropanol and acetone.
  - D. Urine: Positive for hydrocodone, dihydrocodeine, norhydrocodone, amphetamine, fluoxetine, norfluoxetine and meprobamate.
  - D. Brain: Positive for benzene, toluene and xylene by GC/MS.
  - E. Lung: Positive for benzene and toluene by GC/MS.
- V. Decompositional changes.
- VI. See separate Forensic Odontology Report.

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**CAUSE OF DEATH:** Fire-related injuries  
**MANNER:** Accident

9/23/2013

Date Signed

*Kathleen M. Enstice MD*

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**KATHLEEN M. ENSTICE, M.D.**  
**MEDICAL EXAMINER**

GRANT QUINN MCKEE

13-04437

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.

**IDENTIFICATION**

The decedent is received in a zippered orange bag (#16) sealed by red lock #025598. A red OME ID band is on the left ankle, labeled with "U.M.; 13-4437".

**EVIDENCE OF MEDICAL INTERVENTION**

None.

**CLOTHING AND PERSONAL EFFECTS**

The decedent is clad in one left dark brown lace up boot, and has an extremely charred belt with a metal belt buckle around the waist, a pants waistband labeled with "28-32 SHORT" and a waistband from underpants labeled with "TOMMY HILFIGER, Size S". Accompanying the decedent is the bottom of a right boot and a burned piece of yellow NOMEX-like fabric. No personal effects and no fire shelter are received.

**CONDITION OF BODY**

The unembalmed body is cold following refrigeration. Neither rigor mortis nor lividity can be assessed due to thermal changes resulting in contraction of the skin and joints, and thermal changes and charring.

The skin of the back is leathery and tan-brown in color. Otherwise, the entire body has thermal changes and black charring. The skin has been burned away from the lower extremities in the regions of the thighs, knees, and upper shins. The upper extremities are fixed in a pugilistic stance. The scalp and facial hair has been burned away and no hair remains on the torso or extremities.

**EVIDENCE OF INJURY**

None.

**GENERAL EXTERNAL EXAMINATION**

The unclad body is of a 67 ½ inch, 143 pound adult male appearing compatible with the reported age of 21 years. The eyes have indeterminate irides. The conjunctivae have cherry-red discoloration. The nasal bridge and septum are intact. The external auditory canals are unremarkable. The lips and oral mucosa have no lesions. The maxilla and mandible have native dentition in good repair. The symmetric neck has no injuries or palpable masses. The well-developed chest is symmetric. The abdomen is flat and firm. The well-developed back is symmetric. The external genitalia are of a normally developed adult male with bilaterally descended testes. The anus is atraumatic. The paired extremities have no clubbing, cyanosis or edema. The intact fingernails and toenails are short. No needle punctures, needle track marks or hesitation marks are identified. The soles of the feet are unremarkable.

GRANT QUINN MCKEE

13-04437

**IDENTIFYING MARKS, TATTOOS, SCARS**

A multicolored tattoo of an anchor is on the dorsal left foot.

**INTERNAL EXAMINATION**

The body is opened by a standard Y-shaped thoracoabdominal incision. All body organs are in their normal anatomic positions. The internal organs have mild to moderate thermal changes and minimal decompositional changes, and are surrounded by minimal adipose tissue. The subcutaneous fat layer is 0.8 cm thick at mid-abdominal level. The intact serosal surfaces are intact. No adhesions, blood or excess fluid are in the body cavities.

**HEAD/NERVOUS SYSTEM**

The intact reflected scalp, galea and temporalis muscles have no injury. The calvarium and skull base are of normal thickness, with no fractures. The intact dura mater has no epidural or subdural hemorrhages. The blood in the dural sinuses is not clotted. The leptomeninges are thin and transparent. The symmetric 1500 gram brain has a normal gyral configuration, moderate to marked swelling, and cherry-red discoloration; with no subarachnoid hemorrhage or exudate. The pink-tan cerebral cortex has no contusions. The cerebral white matter has faint pink discoloration. The tan-pink caudate nuclei, thalami and basal ganglia are symmetric. The symmetric brainstem and cerebellum are unremarkable. The substantia nigra is normally pigmented. The normally formed blood vessels at the brain base have no atherosclerosis, aneurysm or thrombi. The paired cranial nerves and mammillary bodies are normally distributed. The slit-like ventricles have no hemorrhage. The upper cervical spinal cord is unremarkable. The atlanto-occipital articulation is intact.

**NECK**

The intact cervical spine, strap muscles, blood vessels, prevertebral tissues, hyoid bone and laryngeal and tracheal cartilages have no hemorrhages. The patent upper airway has marked thermal changes characterized by sloughing and cherry-red discoloration of the mucosa, with thick black soot deposition that coats the epiglottis, the epiglottic opening, the larynx and proximal trachea. The mucosal sloughing and cherry red-pink discoloration the length of the tracheal lumen, and the mainstem bronchi and their respective segmental branches. The tongue has soot deposition and thermal changes, but no masses or hemorrhage.

**CARDIOVASCULAR SYSTEM**

The 300 gram heart has intact epicardial surfaces. The patent coronary ostia have normal takeoff angles. The coronary arteries arise normally and follow a codominant distribution, with no thrombi or atherosclerosis. The moderately firm cherry red-brown myocardium has no fibrosis. The atrial and ventricular septa are intact. At one cm below the valve annuli, ventricular thicknesses are: left ventricle 1.3 cm, interventricular septum 1.3 cm and right ventricle 0.4 cm. The cardiac chambers are not dilated. The endocardial surfaces have no hemorrhage or fibrosis. The normally formed cardiac valves have thin, pliable leaflets. The valve circumferences are appropriate to the caliber of the cardiac chambers. The valve cusps and surfaces have no fusion or vegetations. The aorta and its branches arise normally, are of normal caliber and follow the usual course. Elasticity is normal. The smooth intimal surfaces have cherry red discoloration, with no aneurysm formation or dissection. The heart and major blood vessels contain viscous cherry-red maroon blood.

**RESPIRATORY SYSTEM**

The pleural surfaces of the normally formed 760 gram right and 820 gram left lungs have no obvious anthracotic pigmentation. The well-expanded cherry red-maroon parenchyma exudes abundant blood and mild frothy edema fluid, with no masses, consolidation, scars or cavitations. The patent bronchi are of normal caliber and contain cherry-red edema fluid, with no obvious soot deposition. The normally developed, patent pulmonary arteries have no thromboemboli.

**DIGESTIVE/HEPATOBIILIARY SYSTEM**

The unobstructed oropharynx has soot deposition. The normally formed esophagus is of normal caliber, with thermal changes and soot deposition along the superior-most mucosa, and with sloughing of the mucosa extending along the proximal third. The remaining mucosa is faint pink-white and intact. The gastroesophageal junction is unremarkable. The stomach has intact cherry red-tan mucosa, with no hemorrhage, ulcers or masses. The gastric lumen contains 5 ml of thick tan fluid, with several large leafy green vegetable fragments. The small and large intestines and appendix are unremarkable. The large intestines contain brown stool. The lobular cherry red-tan pancreas has no fat necrosis, hemorrhage, cysts or fibrosis. The patent pancreatic ducts are of normal caliber. The normally formed 1530 gram liver has an intact smooth capsule covering moderately firm cherry red-brown parenchyma with no masses, fibrosis or fatty change. The patent intrahepatic and extrahepatic ducts are of normal caliber. The gallbladder contains viscid bile and has smooth velvety mucosa.

**GENITOURINARY SYSTEM**

The normally formed 110 gram right and 140 gram left kidneys have capsules that strip with ease from the smooth cherry red-brown cortical surfaces. The cortices are sharply delineated from the medullary pyramids. The patent renal calyces, pelves, ureters and renal vessels are of normal caliber. The urinary bladder contains 100 ml of yellow urine and has smooth mucosa with faint pink discoloration. The trigone is patent. The prostate gland is not enlarged. The tan testicular parenchyma has thermal changes.

**HEMATOPOIETIC SYSTEM**

The normally formed 160 gram spleen has an intact smooth gray capsule covering moderately soft maroon parenchyma. The lymph nodes have their normal appearance and distribution.

**ENDOCRINE SYSTEM**

The symmetrical thyroid gland has uniform cherry red-brown parenchyma. The normally formed adrenal glands and pituitary gland have no masses or hemorrhage.

**MUSCULOSKELETAL SYSTEM**

The supporting musculature and soft tissues have mild to moderate thermal changes and cherry red discoloration. The axial and appendicular skeletal regions have no fractures, degenerative changes or atraumatic lesions.

**EVIDENCE**

The following items of evidence are collected, inventoried and released to Joshua Nelson #5222 (Yavapai County Sheriff's Office):

- one pair of projective pants, size 28-32 SHORT (burned)
- one belt and metal buckle (burned)
- one piece yellow "Nomex" fabric (burned)
- one left boot and one sole of right boot (burned)
- one Tommy Hilfiger underpants

One blood stain/filter card is collected and retained.  
Cardiac blood, purple top tube, is collected and retained.  
One nasopharyngeal swab is collected and retained.

**RADIOGRAPHS**

Postmortem full body x-rays (total of 14) reveal abundant foreign radiopaque material.

GRANT QUINN MCKEE

13-04437

**SPECIAL STUDIES**

Vitreous humor, red top tube, is collected and submitted for electrolyte analysis, with the following results:

Glucose	11 mg/dL
Urea nitrogen	33 mg/dL
Creatinine	1.5 mg/dL
Chloride	128 mmol/L
Potassium	42.0 mmol/L
Sodium	135 mmol/L

Cardiac blood, red top tube, is collected and submitted for carboxyhemoglobin analysis, with the following result:

Carboxyhemoglobin 21% saturation

**TOXICOLOGY SPECIMENS**

Iliac blood, 2 oz container, is collected and submitted for level I toxicologic testing.

Vitreous humor, red top tube, is collected and submitted for volatile analysis.

Brain, red top tube, is collected and submitted for volatiles testing.

Lung, red top tube, is collected and submitted for volatiles testing.

Urine, 2 oz container, is collected and held.

Cardiac blood, 2 oz container, is collected and held.

Gastric contents, 2 oz container, is collected and held.

Bile, 2 oz container, is collected and held.

Subcutaneous adipose tissue, brain, spleen, liver, kidney, psoas muscle; 2 oz containers each, are collected and held.

**FINAL SUMMARY**

Based on the investigative history as available to me, and my above noted autopsy findings, it is my opinion that Grant Quinn McKee, a 21 year old male, died of fire-related injuries.

The presence of benzene, toluene and xylene were likely due to burning of NOMEX fibers and ethanol.

The manner of death is accident.

KME/hyf

D: 7/02/13

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 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.*



# Maricopa County

Forensic Science Center

701 West Jefferson Street  
Phoenix, Arizona 85007-2908  
Phone: (602) 506-3322  
Fax: (602) 506-1546

July 8, 2013

Kathleen Enstice, M.D.  
Maricopa County Forensic Science Center  
Phoenix, Arizona

Re: Maricopa County Medical Examiner Case # 13-4437

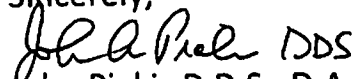
Dear Dr. Enstice,

On July 2, 2013, a dental examination including dental radiographs was completed at the Maricopa County Forensic Science Center on Medical Examiner Case # 13-4437.

Also on July 2, 2013, I received the dental radiographs of Mr. Grant McKee from Advanced Dental Center Prescott, Arizona for a comparison to Case #13-4437.

Upon comparing the antemortem dental radiographs of Mr. Grant McKee and the postmortem dental radiographs of Case # 13-4437, a positive identification has been established, meaning that the antemortem and postmortem dental radiographs match in sufficient detail to establish that they are from the same individual.

Sincerely,

  
John Piakis D.D.S., D.A.B.F.O.  
Forensic Odontologist  
Maricopa County  
Phoenix, Arizona

KME

MARICOPA COUNTY OFFICE OF THE MEDICAL EXAMINER

REPORT OF TOXICOLOGICAL EXAMINATION

Case Number: 13-04437  
Decedent: GRANT QUINN MCKEE  
Date Submitted: 07/02/2013  
Report Date: 09/06/2013

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

Medical Examiner: KATHLEEN M. ENSTICE, MD

**RESULTS\*:**

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

Iliac Blood: Positive for  
Hydrocodone 122 ng/mL (0.122 mg/L)  
Dihydrocodeine  
Norhydrocodone (hydrocodone metabolite)  
Hydromorphone 2 ng/mL (0.002 mg/L)  
Amphetamine 0.12 mg/L  
Fluoxetine 0.13 mg/L  
Norfluoxetine (fluoxetine metabolite)  
Carisoprodol (<2 mg/L)  
Meprobamate (carisoprodol metabolite) (<5 mg/L)  
Acetaminophen (~27 mg/L)  
None detected for ethanol, methanol, isopropanol, acetone, methamphetamine, phencyclidine, cocaine, benzoylecgonine, methadone, benzodiazepines, barbiturates, antihistamines, phenothiazines, tricyclic antidepressants, fentanyl, oxycodone, and acid neutral drugs

Cardiac Blood: Positive for  
Carboxyhemoglobin (21% saturation)

Brain: Positive by GC/MS for  
Benzene  
Toluene  
Xylene


CONTINUED

1/11/13

Lung: Positive by GC/MS for  
Benzene  
Toluene

Urine: Positive for  
Hydrocodone  
Dihydrocodeine  
Norhydrocodone (hydrocodone metabolite)  
Amphetamine  
Fluoxetine  
Norfluoxetine (fluoxetine metabolite)  
Meprobamate (carisoprodol metabolite)  
None detected for 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"



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Norman A. Wade  
Laboratory Director

Jurisdictional Agency: YAVAPAI SO  
By: svp, Tox.1/2000, DAWN