

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



WPR21FA203

MEDICAL

Specialist's Factual Report

February 10, 2023

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A. ACCIDENT

Location: Las Vegas, Nevada
Date: May 24, 2021

B. MEDICAL SPECIALIST

Specialist Turan Kayagil, MD, FACEP
National Transportation Safety Board
Washington, DC

C. DETAILS OF THE INVESTIGATION

1.0 Purpose

This investigation was performed to evaluate the pilot for medical conditions, the use of medications/illicit drugs, and the presence of toxins.

2.0 Methods

The Federal Aviation Administration (FAA) medical case review and the pilot's autopsy and toxicology reports were reviewed. Relevant regulation and medical literature were also reviewed.

D. FACTUAL INFORMATION

1.0 FAA Medical Case Review

According to the FAA medical case review, the 43-year-old male pilot had his last aviation medical examination on January 19, 2021. At that time, he reported 143.5 civilian flight hours. He was 71 inches tall and weighed 208 pounds. He reported no medication use. He reported having Veterans Affairs disability benefits for orthopedic issues; the Aviation Medical Examiner (AME) commented that these issues were mild. The pilot did not report any other active medical conditions, and neither the pilot nor the AME identified any significant concerns. The pilot was issued a second-class medical certificate without limitation.

2.0 Autopsy

The Clark County Office of the Coroner/Medical Examiner performed the pilot's autopsy. According to the autopsy report, the cause of death was blunt force injuries and the manner of death was accident. The autopsy did not identify significant natural disease.

3.0 Toxicology

3.1 NMS Labs Toxicology

At the request of the Clark County Office of the Coroner/Medical Examiner, NMS Labs performed toxicological testing of postmortem liver tissue from the pilot. This testing detected caffeine. Ethanol was not detected.¹

3.2 FAA Toxicology

The FAA Forensic Sciences laboratory also performed toxicological testing of postmortem specimens from the pilot.² Ethanol was detected at 0.012 g/dL in muscle tissue. Ethanol was not detected in brain tissue.³ There was no blood available for testing. An annotation on the FAA toxicology report indicated that all specimens exhibited visible signs of postmortem microbial activity.

3.3 Descriptions of Detected Substances

Ethanol is a type of alcohol. It is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance.⁴ FAA regulation imposes strict limits on flying after consuming ethanol, including prohibiting pilots from flying with a blood ethanol level of 0.04 g/dL or greater.⁵ However, consumption is not the only possible source of ethanol in postmortem specimens. Ethanol can sometimes be produced by microbes in a person's body after death. Postmortem ethanol production can cause an affected toxicological specimen to test positive for ethanol while another specimen from the same person tests negative.^{6,7}

¹ Tested-for substances are available from the NMS Labs website at [Test Code 8052T](#). Caffeine was reported based on screening results without secondary confirmation. According to the NMS Labs toxicology report, the reporting limit for ethanol was 0.04 g/dL.

² The FAA Forensic Sciences laboratory has the capability to test for around a thousand substances including toxins, prescription and over-the-counter medications, and illicit drugs. Some of these substances are listed at <https://jag.cami.jccbi.gov/toxicology>. The FAA Forensic Sciences laboratory does not routinely report caffeine.

³ According to e-mail from an FAA forensic toxicologist, the FAA Forensic Sciences laboratory uses a reporting threshold for ethanol of 0.01 g/dL.

⁴ Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

⁵ [14 CFR § 91.17](#).

⁶ Spitz WU. Forensic aspects of alcohol. In: Spitz WU, Spitz DJ, eds. *Spitz and Fisher's Medicolegal Investigation of Death: Guidelines for the Application of Pathology to Crime Investigation*. 4th ed. Springfield, IL: Charles C Thomas; 2006:1218-1229.

⁷ Kugelberg FC, Jones AW. Interpreting results of ethanol analysis in postmortem specimens: a review of the literature. *Forensic Sci Int*. 2007;165(1):10-29. doi:10.1016/j.forsciint.2006.05.004.

Caffeine is a central nervous system stimulant that is commonly ingested, including in coffee, tea, soft drinks, and chocolate; it is also an ingredient in certain anti-drowsiness medications and headache medications.^{8,9} Caffeine is not generally considered impairing.

E. SUMMARY OF MEDICAL FACTS

The 43-year-old male pilot had his last aviation medical examination on January 19, 2021. At that time, he reported no medication use. He reported no active medical conditions other than mild orthopedic issues. No concerns were identified and he was issued a second-class medical certificate without limitation.

According to the pilot's autopsy report, his cause of death was blunt force injuries and his manner of death was accident. His autopsy did not identify significant natural disease.

Postmortem toxicological testing performed by the FAA Forensic Sciences laboratory detected ethanol at 0.012 g/dL in muscle tissue and did not detect ethanol in brain tissue. Postmortem toxicological testing of liver tissue performed by NMS Labs detected caffeine and did not detect ethanol.

Submitted by:

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⁸ National Institutes of Health National Library of Medicine. NoDoz Alertness Aid. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=e700e809-29b5-799e-e053-2a95a90a235c>. Updated October 11, 2022. Accessed February 10, 2023.

⁹ National Institutes of Health National Library of Medicine. Fioricet. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=c018be7d-f7b8-45e2-97b8-8e7a71740657>. Updated January 1, 2021. Accessed February 10, 2023.