



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

April 15, 2022

Turan Kayagil, MD, FACEP
Medical Officer

A. ACCIDENT INFORMATION

Identification: ERA22FA056

Location: Oak Hill, Florida

Date: November 10, 2021

B. GROUP IDENTIFICATION

No group was formed for the medical evaluation in this accident.

C. DETAILS OF INVESTIGATION

1. Purpose

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

2. Methods

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

3. Findings

a. Medical Case Review

According to the FAA medical case review, the 61-year-old male pilot had his last aviation medical examination on April 22, 2019. At that time, he reported 153 total civilian flight hours. He was 72 inches tall and weighed 163 pounds. He reported using the medications atorvastatin (a prescription medication commonly used to control cholesterol and reduce cardiovascular risk) and aspirin (an over-the-counter medication commonly used to reduce cardiovascular risk, or to treat pain and fever). Those medications generally are not considered impairing. The pilot reported no active medical conditions. No

significant issues were identified, and he was issued a third-class medical certificate, without limitation. This certificate expired at the end of April 2021, by which time the pilot had already completed a BasicMed training course and Comprehensive Medical Examination Checklist (CMEC), in February 2021.¹

b. Autopsy

The Volusia County District 7 Medical Examiner's Office performed the pilot's autopsy. According to the autopsy report, the cause of death was multiple blunt force injuries, and the manner of death was accident. Structural examination of the brain was severely limited by injury. The autopsy did not identify significant natural disease.

c. Toxicology

At the request of the Medical Examiner's Office, NMS Labs performed toxicological testing of cavity blood from the pilot.² This testing detected ethanol at 0.017 g/dL.

The FAA Forensic Sciences Laboratory also performed toxicological testing of postmortem specimens from the pilot.³ Ethanol was detected at 0.014 g/dL in blood, 0.017 g/dL in heart tissue, 0.028 g/dL in brain tissue, and 0.122 g/dL in muscle tissue.⁴ N-butanol was also detected in muscle tissue.

d. Descriptions of Detected Substances

Ethanol is the intoxicating alcohol in beer, wine, and liquor. It can impair judgment, psychomotor performance, cognition, and vigilance.^{5,6} FAA regulation imposes strict limits on flying after consuming ethanol. This includes a prohibition on acting as a crewmember of a civil aircraft while having a blood

¹ BasicMed provisions allow pilots who meet certain requirements to fly without current medical certification. Among those requirements, a pilot must have completed a BasicMed training course within 24 calendar months, and must have had a medical examination with a state-licensed physician using the CMEC within 48 months. Aircraft and operating restrictions also apply. For details, see [14 Code of Federal Regulations \(CFR\) Part 68](#), [14 CFR 61.113\(i\)](#), [14 CFR 61.23\(c\)\(3\)](#), and https://www.faa.gov/licenses_certificates/airmen_certification/basic_med/.

² The NMS Labs toxicology report listed tested-for substances as: amphetamines, barbiturates, benzodiazepines, buprenorphine/metabolite, cannabinoids, cocaine/metabolites, fentanyl/acetyl fentanyl, methadone/metabolite, methamphetamine/MDMA, opiates, oxycodone/oxymorphone, phencyclidine, acetone, ethanol, isopropanol, and methanol.

³ The FAA Forensic Sciences Laboratory tests specimens for over 1,300 substances including toxins, prescription and over-the-counter medications, and illicit drugs.

⁴ The autopsy report implied, but did not explicitly state, that the blood specimen provided to the FAA Forensic Sciences Laboratory was cavity blood.

⁵ 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.

⁶ Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

ethanol level of 0.04 g/dL or greater.⁷ Ethanol can also be produced by microbes in a person's body tissues after death.^{5,8} N-butanol is another alcohol that can be produced by microbes in a person's body tissues after death.⁸

D. SUMMARY OF MEDICAL FINDINGS

The 61-year-old male pilot had his last aviation medical examination on April 22, 2019. At that time, he reported no active medical conditions, and reported using the medications atorvastatin and aspirin, which generally are not considered impairing. He was issued a third-class medical certificate, without limitation, which expired at the end of April 2021. He completed a BasicMed training course and Comprehensive Medical Examination Checklist in February 2021.

The Volusia County District 7 Medical Examiner's Office performed the pilot's autopsy. According to the autopsy report, the cause of death was multiple blunt force injuries, and the manner of death was accident. Structural examination of the brain was severely limited by injury. The autopsy did not identify significant natural disease.

Two labs performed toxicological testing of postmortem specimens from the pilot. One lab detected ethanol at 0.017 g/dL in cavity blood. The other lab detected ethanol at 0.014 g/dL in blood, 0.017 g/dL in heart tissue, 0.028 g/dL in brain tissue, and 0.122 g/dL in muscle tissue. That lab also detected n-butanol in muscle tissue.

⁷ [14 Code of Federal Regulations § 91.17.](#)

⁸ 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.