

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



Medical Factual Memorandum for Record

September 6, 2024

A. CASE

NTSB ID: CEN23FA155
Location: Mammoth Spring, Arkansas
Date: April 13, 2023

B. MEDICAL SPECIALIST

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

C. DETAILS

1.0 Description of Review

For purposes of evaluating the pilot for potentially impairing substances and potentially impairing medical conditions, the above Medical Specialist reviewed the following sources of medical information, along with selected relevant regulation, medical literature, and investigator reports.

- Final Federal Aviation Administration (FAA) medical case review
- Autopsy report
- FAA Forensic Sciences Laboratory toxicology report

2.0 Summary of Medical Facts

The 67-year-old male pilot's last aviation medical examination was May 20, 2015. At that time, he reported no medication use or medical conditions. He was issued a third-class medical certificate limited by a requirement to have available glasses for near vision. That medical certificate expired in 2017. The pilot

subsequently completed a BasicMed education course and reported completing a BasicMed Comprehensive Medical Examination Checklist (CMEC), both most recently in May 2021.¹

The Arkansas State Crime Laboratory performed the pilot's autopsy. According to the pilot's autopsy report, his cause of death was multiple injuries, and his manner of death was suicide. The autopsy was limited by the extent of the pilot's injuries. Mild coronary artery disease was present (up to 30% narrowing of the left anterior descending coronary artery, and minimal atherosclerosis of the left circumflex and right coronary arteries). Within the limitations of the autopsy, it did not otherwise identify significant natural disease.

Postmortem toxicological testing by the FAA Forensic Sciences Laboratory detected ethanol at 0.048 g/dL, along with n-propanol, in cavity blood. Neither ethanol nor n-propanol was detected in vitreous fluid.

Ethanol is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance.² FAA regulation imposes strict limits on flying after consuming ethanol, including a prohibition on piloting a civil aircraft while having a blood ethanol level of 0.04 g/dL or greater.³ Alcohol consumption is not the only possible source of ethanol in postmortem specimens. Ethanol may sometimes be produced by microbes in a person's body after death, potentially elevating ethanol levels in some postmortem specimens but not others. Vitreous fluid is generally the specimen type best protected against postmortem microbial ethanol production.⁴⁻⁷ N-propanol is

¹ BasicMed provisions allow pilots who meet certain requirements to fly (as pilot in command or as a required flightcrew member) without current medical certification. Among those requirements, a pilot must have completed a BasicMed education 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 Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

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

⁴ 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.

⁵ 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.

⁶ Boumba VA, Exadactylou P, Velivasi G, Ziavrou KS, Fragkouli K, Kovatsi L. The frequency of ethanol, higher alcohols and other low molecular weight volatiles in postmortem blood samples from unnatural deaths. *Forensic Sci Int*. 2022;341:111503. doi:10.1016/j.forsciint.2022.111503.

⁷ Oshaug K, Kronstrand R, Kugelberg FC, Kristoffersen L, Mørland J, Høiseth G. Frequency of postmortem ethanol formation in blood, urine and vitreous humor - improving diagnostic accuracy with the use of ethylsulphate and

another alcohol that can be produced by microbes in a person's body after death. Detection of n-propanol in a postmortem specimen is potentially indicative of postmortem microbial activity in the specimen, but does not necessarily mean that microbial activity produced ethanol.^{4,6}

Submitted by:

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putrefactive alcohols. *Forensic Sci Int.* 2022;331:111152. doi:10.1016/j.forsciint.2021.111152