

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



Medical Factual Memorandum for Record

July 30, 2024

A. CASE

NTSB ID: CEN23FA167
Location: Lewisville, Arkansas
Date: April 30, 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 – pilot
- Toxicology report – pilot

2.0 Summary of Medical Facts

The 46-year-old male non-certificated pilot had not applied for FAA medical certification.

The Arkansas State Crime Laboratory performed the pilot's autopsy. According to the pilot's autopsy report, his cause of death was multiple blunt force injuries and his manner of death was accident. The autopsy did not identify significant natural disease.

Postmortem toxicological testing by the FAA Forensic Sciences Laboratory identified ethanol at 0.02 g/dL in the pilot's cavity blood. Ethanol was not detected in the pilot's urine or vitreous. N-propanol was also detected at a low level in cavity blood and was not detected in urine in urine or vitreous. Dextromethorphan was detected in urine; testing was inconclusive for dextromethorphan in cavity blood. Dextrorphan was detected in cavity blood; testing was inconclusive for dextrorphan in urine. Metformin was detected in cavity blood and urine. Amlodipine, lisinopril, and hydrochlorothiazide were detected in cavity blood and urine, and chlorothiazide was detected in urine but not in cavity blood. Acetaminophen was detected in cavity blood and urine. Salicylic acid was detected in urine but not in cavity blood.

Ethanol is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance.¹ 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.² Alcohol 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.^{3,4} Ethanol may also be an additive in some automotive fuel.

N-propanol is 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.^{3,4}

Dextromethorphan is a cough suppressant medication that is available over the counter in a variety of cold and allergy products. Dextromethorphan is not typically impairing at levels associated with medicinal use.⁵ The FAA states that pilots

¹ Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

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

³ 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.

⁴ 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.

⁵ Couper FJ, Logan BK. Drugs and Human Performance Fact Sheets. National Highway Traffic Safety Administration. DOT HS 809 725. April 2014 (Revised). <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drughumanperformfs.pdf>. Accessed July 30, 2024.

who use dextromethorphan should observe a waiting period for the drug to be cleared from circulation before flying.⁶ Dextrorphan is an active metabolite of dextromethorphan.

Metformin is a prescription oral medication commonly used for blood sugar control in diabetes and prediabetes. Amlodipine, lisinopril, and hydrochlorothiazide are prescription medications commonly used to treat high blood pressure. Chlorothiazide may be present as an impurity in hydrochlorothiazide, and is also a prescription diuretic medication. Acetaminophen is a medication available in a wide variety of over-the-counter products as a pain and fever reducer. Salicylic acid is the primary active metabolite of aspirin, a widely available over-the-counter medication that can be used to control pain and fever and to reduce cardiovascular risk. Metformin, amlodipine, lisinopril, hydrochlorothiazide, chlorothiazide, acetaminophen, and salicylic acid/aspirin are not generally considered impairing.

Glucose was measured at 88 mg/dL in urine and was not detected in vitreous.⁷

Submitted by:

Turan Kayagil, MD, FACEP
Medical Officer

⁶ Federal Aviation Administration. Pilot information - Over-the-counter medications. Federal Aviation Administration website. https://www.faa.gov/pilots/medical_certification/medications. Updated June 5, 2024. Accessed July 30, 2024.

⁷ According to [the FAA Forensic Sciences Laboratory's website](#), the laboratory considers glucose (sugar) levels above 100 mg/dL to be abnormal in urine and levels above 125 mg/dL to be abnormal in vitreous. The choice of these values is discussed in FAA Aerospace Medicine Technical Report [DOT/FAA/AM-00/22](#).