

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



Medical Factual Memorandum for Record

May 22, 2024

A. CASE

NTSB ID: CEN23FA071
Location: Galliano, Louisiana
Date: December 29, 2022

B. MEDICAL SPECIALIST

Specialist JE Tuttle MD MHA FACS
National Transportation Safety Board
Washington, DC

C. DETAILS

1.0 Description of Review

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

- Federal Aviation Administration (FAA) final medical case review
- Autopsy report- pilot
- Toxicology report – pilot

2.0 Summary of Medical Facts

According to the FAA medical case review, the 32-year-old male pilot's last aviation medical examination was February 23, 2022. At that time, he reported no medical conditions or medication use. He was issued a second-class medical certificate without limitation.

The autopsy of the pilot was performed by the Jefferson Parish Forensic Center, as authorized by the Lafourche Parish Coroner. According to the autopsy report, the cause of death was multiple blunt force injuries with subsequent drowning. The manner of death was accident. According to the autopsy report, extensive head and facial trauma was present. The autopsy did not identify significant natural disease.

At the request of the Jefferson Parish Coroner's Office, NMS Labs performed toxicology testing of the pilot's postmortem liver tissue. Ethanol was detected at 0.11 g/dL. Caffeine was also presumptively positive in liver tissue.¹

The FAA Laboratory performed toxicology testing of postmortem specimens from the pilot.² Ethanol was detected in cavity blood at 0.042 g/dL and vitreous fluid at 0.029 g/dL but was not detected in urine. Isopropanol was detected in cavity blood at 0.004 g/dL but not in vitreous fluid or urine. N-propanol was detected in cavity blood and vitreous fluid but not urine. N-butanol was detected in cavity blood but not vitreous fluid or urine. The cavity blood specimen was unsuitable for carboxyhemoglobin testing.

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.³ 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.⁴ 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. Postmortem ethanol production is made more likely by

¹ "Presumptively positive" means detected by an initial screening test without a second test performed to confirm the result. Information about the NMS Labs tissue testing procedures, including tested-for substances, is available on the NMS Labs website at Test Code [8052TI](#).

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.

³ Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

⁴ 14 Code of Federal Regulations §91.17. General operating and flight rules. <https://www.ecfr.gov/current/title-14/chapter-I/subchapter-F/part-91>. Updated May 7, 2024. Accessed May 16, 2024.

extensive traumatic injury and can cause an affected toxicological specimen to test positive for ethanol while another specimen from the same person tests negative.⁵

Isopropanol is an alcohol commonly found in disinfectants, anti-freeze, and window cleaners. Isopropanol can also be found in postmortem specimens due to antemortem or postmortem sources. Postmortem production of isopropanol is a byproduct of the decomposition process due to microbial activity.^{6, 7, 8}

N-propanol and particularly n-butanol are other alcohols that can be produced by microbes in a person's body after death. Their presence in a postmortem specimen is potentially indicative of postmortem microbial activity in the specimen but does not reliably indicate that postmortem ethanol production occurred^{5,8,9}

Caffeine is a central nervous system stimulant that is commonly ingested, including in coffee, tea, soft drinks, and chocolate, and is also an ingredient in certain anti-drowsiness medications and headache medications.¹⁰ Caffeine is not generally considered impairing.

Submitted by:

JE Tuttle MD MHA FACS
Medical Officer

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 Avedschmidt SE, Melton A, Turner KA, Sommer S, Olden NK, Cohle S. The Impact of Donor Preparation for Tissue Procurement on Postmortem Vitreous Isopropanol Concentration. *Am J Forensic Med Pathol*. . 2023;44(2):97-99. doi:10.1097/PAF.0000000000000810.

⁷ Kimberley Molina, D. A Characterization of Sources of Isopropanol Detected on Postmortem Toxicologic Analysis. *Journal of Forensic Sciences*, 2010,55: 998-1002. <https://doi.org/10.1111/j.1556-4029.2010.01386.x>.

⁸ 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.

⁹ Gubala W. n-Butanol in blood as the indicator of how long a dead body lay in water. *Forensic Science International*. 1990;46(1-2):127-128. doi:https://doi.org/10.1016/0379-0738(90)90149-s

¹⁰ National Institutes of Health National Library of Medicine. Caffeine. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=6d9b3926-7198-5e00-e053-2a91aa0a9580>. Updated September 23, 2020. Accessed January 11, 2024.