

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



Medical Factual Memorandum for Record

February 4, 2025

A. CASE

NTSB ID: WPR23FA256
Location: Saint Maries, Idaho
Date: July 6, 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 (including NMS Labs toxicology report)
- FAA Forensic Sciences Laboratory toxicology report

2.0 Summary of Medical Facts

The 75-year-old male pilot's last aviation medical examination was July 1, 2022. At that time, he reported a medical history including prediabetes (treated with metformin), high blood pressure, and gout. His high blood pressure was noted to be qualified under Conditions Aviation Medical Examiners Can Issue (CACI) criteria. The

FAA had issued him a letter of eligibility for the CACI program for high blood pressure and prediabetes in 2020.¹ At his last aviation medical examination, the pilot reported using metformin (a prescription oral medication commonly used to help control blood glucose in prediabetes and diabetes), bisoprolol/hydrochlorothiazide (a prescription combination of two medications used to treat high blood pressure), amlodipine (a prescription medication that can be used to treat high blood pressure and certain types of coronary artery disease), simvastatin (a prescription medication commonly used to help control cholesterol and reduce cardiovascular risk), and allopurinol (a prescription medication used to lower uric acid for treatment of gout). The pilot was issued a third-class medical certificate limited by a requirement to have available glasses for near vision.

The Spokane County Medical Examiner's Office performed the pilot's autopsy, as authorized by the Benewah County Coroner. In the opinion of the forensic pathologist who performed the autopsy, the pilot's cause of death was blunt force injuries of the head, neck, torso, and extremities. The autopsy identified evidence of hypertensive and atherosclerotic cardiovascular disease, including coronary artery disease with 80% narrowing of the left anterior descending coronary artery by plaque, moderate dilation of both cardiac ventricles, mild mitral valve calcification, moderate aortic plaque, and kidney tissue changes of the type that may be seen in chronic high blood pressure. Heart weight and ventricular wall and septal thicknesses were normal. The remainder of the autopsy, including visual examination of the heart, did not identify other significant natural disease.

According to the pilot's autopsy report, tableside screening tests were conducted at the time of autopsy. Screening of urine was positive for ketones at 40 mg/dL and negative for glucose.² Screening of vitreous fluid was negative for ketones and glucose. Urine drug screening was negative for screened-for substances.³

As part of the death investigation, NMS Labs performed toxicological testing of postmortem chest cavity blood from the pilot. Amlodipine and caffeine were presumptively detected (detected by screening without a second test to confirm). Carboxyhemoglobin (a marker of carbon monoxide exposure) was measured and showed no abnormal elevation.

¹ According to an e-mail from the physician who performed the FAA medical case review, at the pilot's last aviation medical examination, he reported prediabetes treated with metformin, and the examiner acknowledged this condition but did not comment on its CACI status.

² Normal ketone screening results are negative in urine and vitreous fluid. In living people, ketones are byproducts of fat metabolism. Fat metabolism may increase when cells have a limited supply of glucose to metabolize (for example, during prolonged fasting due to low blood glucose, or in inadequately controlled diabetes due to cells' limited ability to metabolize blood glucose).

³ Screened-for substances were not specified in the autopsy report.

The FAA Forensic Sciences Laboratory also performed toxicological testing of postmortem specimens from the pilot.⁴ Glucose was measured at 69 mg/dL in urine; glucose was not detected in vitreous fluid.⁵ The medications metformin, bisoprolol, hydrochlorothiazide, and amlodipine were detected in cavity blood and urine. These medications were reported by the pilot at his last aviation medical examination and are described above; they are not generally considered impairing.

Submitted by:

Turan Kayagil, MD, FACEP
Medical Officer

⁴ 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.

⁵ Glucose in random fresh urine normally is 25 mg/dL or less. It may increase due to high blood glucose or altered kidney function. Urine glucose is raised by high blood glucose only if the blood glucose surpasses a certain threshold, which varies among individuals, but which is typically higher than normal blood glucose. The [FAA Forensic Sciences Laboratory](#) considers postmortem glucose levels to be abnormal if above 100 mg/dL in urine or above 125 mg/dL in vitreous fluid. The choice of these values is discussed in FAA Aerospace Medicine Technical Report [DOT/FAA/AM-00/22](#). Vitreous glucose decreases after death, so negative vitreous glucose is not considered abnormal.