

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



Medical Factual Memorandum of Record

April 29, 2026

A. CASE

NTSB ID: CEN24FA170
Location: Bristol, Indiana
Date: April 30, 2024

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 and pilot-rated passenger 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) Medical Case Review
- Autopsy and Coroner's reports - pilot
- FAA Forensic Sciences Laboratory Toxicology report - pilot
- Autopsy and Coroner's reports - pilot-rated passenger
- FAA Forensic Sciences Laboratory Toxicology report - pilot-rated passenger

2.0 Summary of Medical Facts

2.1 Pilot

According the FAA medical case review, the 81-year-old male pilot's last aviation medication examination was July 9, 2018. At that time, the pilot reported a history of high cholesterol and hypothyroidism. He reported taking simvastatin (a prescription medication commonly used to treat elevated cholesterol) and levothyroxine (a prescription medication commonly used to treat low thyroid hormone). The aviation medical examiner (AME) noted that the pilot's low thyroid hormone met Conditions AMEs-Can Issue (CACI) criteria, and issued the pilot a third-class medical certificate limited by a requirement to wear corrective lenses. The pilot's medical certificate subsequently expired. The pilot completed a BasicMed course, most recently in June 2022, and reported completing a Comprehensive Medical Examination Checklist (CMEC), most recently in June 2020.¹

At the request of the Elkhart County Coroner's Office, Western Michigan University School of Medicine Medical Examiner and Forensic Services performed the pilot's autopsy. According to the associated coroner's report, the pilot's cause of death was multiple blunt force injuries, and his manner of death was accidental. Anatomical evaluation of the brain was not possible due to the extent of injury. The pilot's autopsy identified up to 50% narrowing of the coronary arteries. No further anatomic detail about the coronary artery narrowing was provided in the autopsy report. Moderate plaque was identified in the aorta. The remainder of the autopsy, including visual examination of the heart, did not identify other significant natural disease. Microscopic evaluation of the heart was not performed.

At the request of the Western Michigan University School of Medicine, Axis Forensic Toxicology performed toxicological testing of postmortem blood from the pilot. Ethanol was detected at 0.026 g/dL. No other tested-for substances were detected.

The FAA Forensic Sciences Laboratory also performed toxicological testing of postmortem specimens from the pilot.² Ethanol was detected in cavity blood at 0.011 g/dL and in liver tissue at 0.013 g/hg.³ Ethanol was not detected in brain tissue.

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\(3\)](#) and https://www.faa.gov/licenses_certificates/airmen_certification/basic_med/.

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 In tissue, concentrations in g/hg are approximately equivalent to concentrations in g/dL.

Losartan, metoprolol, and desmethylsildenafil were detected in liver and muscle tissue.

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.⁴ 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.⁵ 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 tissues and fluids after death. Postmortem ethanol production is made more likely by extensive traumatic injury.⁶

Desmethylsildenafil is an active metabolite of sildenafil. Sildenafil is a prescription medication commonly used to treat erectile dysfunction, as a sexual enhancement aid, or in the treatment of certain other conditions, including pulmonary hypertension. Sildenafil is not typically impairing, although the FAA states that pilots should wait 8 hours after using it before flying, to monitor for side effects.⁷

Losartan is a prescription medication commonly used to treat high blood pressure. Metoprolol is a prescription medication commonly used to treat high blood pressure, chest pain, and heart failure. Losartan and metoprolol are not generally considered impairing.

2.2 Pilot-Rated Passenger

According to FAA medical case review, the 78-year-old male pilot-rated passenger's last aviation medical examination was in September 2006. At that time, the pilot-rated passenger reported no active medical conditions or medication use. He was issued a second-class medical certificate limited by a requirement to wear corrective lenses. The pilot-rated passenger's medical certificate subsequently expired. The pilot-rated passenger completed a BasicMed course, and reported completing a BasicMed CMEC, both most recently in December 2023.¹

⁴ Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

⁵ [Code of Federal Regulations 14 \(CFR\), §91.17](#).

⁶ 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.

⁷ Federal Aviation Administration. Pharmaceuticals (therapeutic medications) erectile dysfunction and benign prostatic hyperplasia medications. Guide for Aviation Medical Examiners. https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/pharm/ed/. Updated August 25, 2017. Accessed April 17, 2026.

At the request of the Elkhart County Coroner's Office, Western Michigan University School of Medicine Medical Examiner and Forensic Services performed the pilot-rated passenger's autopsy. According to the associated coroner's report, the pilot-rated passenger's cause of death was multiple blunt force injuries, and his manner of death was accident. The pilot-rated passenger's autopsy identified up to 60% narrowing of the coronary arteries. No further anatomic detail about the coronary artery narrowing was provided in the autopsy report. Moderate plaque was identified in the aorta. The remainder of the autopsy, including visual examination of the heart, did not identify other significant natural disease. Microscopic evaluation of the heart was not performed.

At the request of the Western Michigan University School of Medicine, Axis Forensic Toxicology performed toxicological testing of postmortem clotted blood from the pilot-rated passenger. No tested-for substances were detected.

The FAA Forensic Sciences Laboratory also performed toxicological testing of postmortem specimens from the pilot-rated passenger.² Metformin, glipizide, atorvastatin, metoprolol, lisinopril, hydrochlorothiazide, chlorothiazide, and oxprenolol were detected in liver tissue and urine. Salicylic acid was detected in urine but not in liver tissue. Glucose was measured at 12 mg/dL in urine (a normal result).⁸

Metformin and glipizide are prescription oral medications commonly used to help control blood sugar in diabetes. Metformin and glipizide may be used individually or in combination.^{9,10,11} Metformin and glipizide are not typically impairing (although side effects such as low blood sugar are possible).

Atorvastatin is a prescription medication commonly used to treat high cholesterol and reduce cardiovascular risk. Metoprolol is a prescription medication commonly used to treat high blood pressure, chest pain, and heart failure. Lisinopril is a prescription medication commonly used to treat high blood pressure. It can also

⁸ The FAA Forensic Sciences Laboratory considers glucose levels in postmortem urine to be abnormal if above 100 mg/dL. Glucose in random fresh urine normally is 25 mg/dL or less, and may increase due to high blood glucose or altered kidney function. Urine glucose is raised by high blood glucose when the blood glucose surpasses a certain threshold, which varies among individuals, but which is typically higher than normal blood glucose.

⁹ National Library of Medicine National Institutes of Health. Metformin hydrochloride. DailyMed. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=56d13a1c-b289-4528-b23c-60f5427b4552let_film_coated. Updated December 23, 2020. Accessed April 17, 2026

¹⁰ National Library of Medicine National Institutes of Health. Glipizide tablet. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=ad55dfd7-ffb5-478a-aa84-1009fa921e22>. Updated December 31, 2023. Accessed April 28, 2026.

¹¹ National Library of Medicine National Institutes of Health. Glipizide and metformin hcl tablet. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=ac018f64-fd9d-4b3c-b0ac-ca305b8df635>. Updated December 10, 2025. Accessed April 28, 2026

be used in combination with hydrochlorothiazide.¹² Hydrochlorothiazide is a prescription diuretic medication that is commonly used to treat high blood pressure. Chlorothiazide may be present as an impurity in hydrochlorothiazide, and also may occasionally be prescribed as a diuretic medication. 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. Salicylic acid can also be found in some over-the-counter topical skin products. Atorvastatin, metoprolol, lisinopril, hydrochlorothiazide, chlorothiazide, and salicylic acid are not typically impairing.

Oxprenolol is a sometimes used outside the US to treat conditions including high blood pressure, chest pain, and cardiac rhythm abnormalities. The US Food and Drug Administration (FDA) lists oxprenolol as discontinued.¹³ Oxprenolol has been proposed as a treatment for muscle wasting as a result of Amyotrophic Lateral Sclerosis (ALS), a progressive neurological disease. The FDA granted oxprenolol orphan drug designation status for ALS treatment in 2024 (incentivizing research for treating this rare condition), but has not approved the drug for this use.^{14,15}

Submitted by:
JE Tuttle MD MHA FACS
Medical Officer

¹³ See [Drugs@FDA](#). "Discontinued" products are approved products that have never been marketed, have been discontinued from marketing, are for military use, are for export only, or have had their approvals withdrawn for reasons other than safety or efficacy after being discontinued from marketing ([Drugs@FDA Glossary of Terms](#)).

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¹⁴ US Department of Health and Human Services. US FDA. Orphan Drug Designations and Approvals. Oxprenolol. August 2024.
<https://www.accessdata.fda.gov/scripts/opdlisting/oopd/detailedIndex.cfm?cfgridkey=1019324>.

¹⁵ US FDA: Designating an Orphan Product. <https://www.fda.gov/industry/medical-products-rare-diseases-and-conditions/designating-orphan-product-drugs-and-biological-products>]