

# National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



## Medical Factual Memorandum for Record

March 14, 2024

### A. CASE

NTSB ID: ERA22FA351  
Location: South Haven Charter Township, Michigan  
Date: August 2, 2022  
Time: 0800 EDT

### 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-rated passenger and the certified flight instructor / pilot in command (pilot) for potentially impairing medical conditions and potentially impairing 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 report - pilot-rated passenger
- Toxicology report - pilot-rated passenger
- Autopsy report - pilot
- Toxicology report - pilot

## **2.0 Summary of Medical Facts**

### **2.1 Pilot-Rated Passenger**

According to the FAA medical case review, the 70-year-old male pilot-rated passenger's last aviation medical examination was on October 30, 2020. At that time, he was 66 inches tall and weighed 145 pounds. He reported taking atorvastatin (a prescription medication used to control high cholesterol and lower cardiovascular risk). This medication is not generally considered impairing. The pilot-rated passenger reported no active medical conditions. No significant medical concerns were identified, and he was issued a third-class medical certificate with the limitation that he must wear corrective lenses for near and distant vision.

The Medical Examiner and Forensic Services of the Western Michigan University (WMU) School of Medicine performed the autopsy of the pilot-rated passenger. According to the autopsy report, the pilot-rated passenger's cause of death was multiple blunt force injuries, and his manner of death was accident. The autopsy did not reveal significant natural disease. At the request of the WMU School of Medicine, NMS Labs performed postmortem toxicological testing of the pilot-rated passenger's liver tissue.<sup>1</sup> No tested-for substances were detected.

The FAA Forensic Sciences Laboratory performed postmortem toxicological testing of the pilot-rated passenger's specimens.<sup>2</sup> Ethanol was detected in liver tissue at 0.05 g/hg and was not detected in brain tissue.<sup>3</sup> No vitreous fluid was available for testing. N-propanol was detected in liver tissue but not detected in brain tissue. Atorvastatin was 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.<sup>4</sup> 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 extensive traumatic injury and can cause an affected toxicological specimen to test positive for ethanol while another specimen from the same person tests negative.<sup>5</sup>

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<sup>1</sup> Information about the tissue testing procedure, including tested-for substances, is available on the NMS Labs website at Test Code [8051T1](#)

<sup>2</sup> 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.

<sup>3</sup> In tissue, concentrations in g/hg are approximately equivalent to concentrations in g/dL.

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

<sup>5</sup> Kugelberg FC, Jones AW. Interpreting results of ethanol analysis in postmortem specimens: a review of the

N-propanol is another alcohol that can be produced by microbes in a person's body after death. Its 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.<sup>5,6</sup>

Atorvastatin is a prescription medication commonly used to treat high cholesterol and reduce cardiovascular risk.<sup>7</sup> Atorvastatin is not generally considered impairing.

## 2.2 Pilot

According to the FAA medical case review, the 70-year-old male pilot in command's last aviation medical examination was January 9, 2021. At that time, the pilot was 67 inches tall and weighed 205 pounds. He reported taking metoprolol (a prescription medication that can be used to treat high blood pressure and certain other heart conditions), lisinopril (a prescription medication used to treat high blood pressure), rosuvastatin (a prescription medication used to treat high cholesterol and reduce cardiovascular risk), and aspirin (an over-the-counter medication that can be used as an anti-inflammatory medication or to reduce cardiovascular risk). None of these medications are generally considered impairing. The pilot also reported a history of hypertension, coronary artery disease with a coronary artery bypass grafting procedure (CABG) in 2013. At the last exam, the AME noted a new right bundle branch block on the pilot's EKG. The pilot was issued a first-class medical certificate by AME-Assisted Special Issuance, limited by a requirement to wear corrective lenses, and not valid for any class after January 31, 2022.<sup>8</sup>

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literature. *Forensic Sci Int.* 2007;165(1):10-29. doi:10.1016/j.forsciint.2006.05.004.

<sup>6</sup> 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.

<sup>7</sup> National Institutes of Health National Library of Medicine. Atorvastatin Calcium Tablet. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=6ccdb6f3-22c7-5b48-46bc-ce4a4c65eb4d>. Updated November 30, 2020. Accessed March 12, 2024.

<sup>8</sup> AME-Assisted Special Issuance is a process by which an AME may re-issue a medical certificate under the provisions of an applicant's FAA Authorization for Special Issuance if the applicant provides specific required medical information from treating physician(s) as set forth in the Authorization letter. AMEs may not issue initial Authorizations, and AME-Assisted Special Issuance determinations are subject to review by the FAA. Additional information about the AME-Assisted Special Issuance process is available on the [FAA AME Guide website](#).

The pilot had completed a BasicMed course, most recently on March 24, 2022, and had reported completing a BasicMed Comprehensive Medical Examination Checklist (CMEC) on that same date.<sup>9</sup>

According to the medical case review, the pilot had received an authorization for Special Issuance of Medical Certification for the bilateral retinal tears treated with laser retinopexy in 2011. The first Authorization for Special Issuance for coronary artery disease and CABG was in 2013. The pilot was issued an Authorization for Assisted Special Issuance for coronary artery disease, CABG, and medication on March 24, 2021.

The Medical Examiner and Forensic Services of the WMU School of Medicine performed the autopsy of the pilot. According to the autopsy report, the pilot's cause of death was multiple blunt force injuries, and his manner of death was accident. The autopsy revealed an enlarged heart. Heart weight was 860 g (normal heart weight for a male of the pilot's autopsy body weight of 223 pounds is roughly 300-520 g).<sup>10</sup> Biventricular dilatation and severe native coronary artery disease were present. All coronary artery bypass grafts were patent and without significant stenosis. Further examination of the heart, brain, and lungs did not demonstrate other significant natural disease. At the request of the Medical Examiner and Forensic Services, NMS Labs performed postmortem toxicological testing of the pilot's cavity blood and urine.<sup>11</sup> No tested-for substances were detected.

The FAA Forensic Sciences Laboratory performed postmortem toxicological testing of the pilot.<sup>2</sup> Metoprolol and valsartan were detected in cavity blood and urine.

Metoprolol is a prescription medication used to treat high blood pressure, angina, heart failure, and abnormal heart rates.<sup>12</sup> Valsartan is a prescription

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<sup>9</sup> 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/](https://www.faa.gov/licenses_certificates/airmen_certification/basic_med/).

<sup>10</sup> Kitman DW, Scholz DG, Hagem PT, Ilstrup DM, Edwards WD. Age-Related Changes in Normal Human Hearts During the First 10 Decades of Life. Part II (Maturity): A Quantitative Anatomic Study of 765 Specimens from Subjects 20 to 99 Years Old. *Mayo Clinic Proceedings*. 1988;63(2):137-146. doi:[https://doi.org/10.1016/s0025-6196\(12\)64946-](https://doi.org/10.1016/s0025-6196(12)64946-)

<sup>11</sup> Information about the urine and blood testing procedures, including tested-for substances, is available on the NMS Labs website at Test Codes [8050U](#) and [8041B](#). According to the NMS Labs analysis summary, testing of cavity blood for volatile substances (including ethanol) was not performed due to a "sample matrix problem."

<sup>12</sup> National Institutes of Health National Library of Medicine. Metoprolol tartrate. Updated January 31, 2024. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=809c6386-0039-42ff-a03e-e42733e229b8>. Accessed March 12, 2024.

medication used to treat high blood pressure and heart failure with left ventricular dysfunction.<sup>13</sup> Metoprolol and valsartan are not generally considered impairing.

Submitted by:

JE Tuttle MD MHA FACS  
Medical Officer

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<sup>13</sup> National Institutes of Health National Library of Medicine. Valsartan tablet, film coated. Updated January 11, 2024. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=ab5e0e5a-5bdf-4cfc-9d18-57ea4d642f65>. Accessed March 12, 2024.