



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report **January 7, 2022**

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Medical Officer

A. ACCIDENT: ERA21FA212; La Belle, Florida

Date/Time: May 6, 2021; 3:20 p.m. (EDT)
Aircraft: Ted Smith Aerostar 600, C-FAAZ
Injuries: 1 fatal, 1 serious
Flight Conducted under Part 91 personal flight

B. GROUP IDENTIFICATION

No group was formed for the medical evaluation in this accident.

C. DETAILS OF INVESTIGATION

Purpose

This investigation was performed to evaluate the pilot and pilot-rated passenger for medical conditions, the use of medications/illicit drugs, and the presence of toxins.

Methods

The Federal Aviation Administration (FAA) medical case review, correspondence with the Transportation Safety Board of Canada (TSB) about the pilot's medical certification¹, and the pilot's autopsy and FAA Forensic Sciences Laboratory toxicology² reports were reviewed. The pilot-rated passenger's FAA medical certification file was reviewed. Other relevant medical and regulatory issues were reviewed.

Pilot

FAA Medical Case Review and TSB correspondence on medical certification

According to the FAA medical case review, there were no records of the 67-year-old male pilot having applied for a medical certificate in the United States; the pilot was a Canadian national. According to the TSB correspondence, the pilot's most recent medical examination was completed in May 2020. A category 1 license was issued with knowledge of a previous condition

¹ Email response from the Transportation Safety Board of Canada concerning questions related to medical certification of pilot, 12/24/21.

² See <https://jag.cami.jccbi.gov/toxicology/> for a complete list of tested-for substances.

and knowledge of currently taking Xarelto (rivaroxaban).³ The pilot had a restriction that he was to have reading glasses available. There were no notable physical findings on the examination.

Autopsy

According to the autopsy report from the District 21 Medical Examiner's Office, Lee-Hendry-Glades Counties, Florida the pilot's cause of death was atlanto-occipital dislocation due to blunt force head and neck trauma due to airplane crash and the manner of death was accident. The pilot was 70 inches tall and 221 pounds. No significant natural disease was identified.

Toxicology

FAA Forensic Sciences Laboratory toxicology testing detected the allergy medication cetirizine in the pilot's heart blood at 137 nanograms per milliliter (ng/mL) and urine. The narcotic pain medication codeine was detected in his heart blood at 4 ng/mL and urine at 410 ng/mL; morphine was detected in urine at 281 ng/mL. The non-sedating pain medications acetaminophen and ketorolac were detected in his heart blood and urine.⁴ The mood stabilizing medication lamotrigine was detected in his heart blood and urine. Postmortem toxicological testing for the medical examiner's office detected caffeine in the pilot's abdominal blood.

Relevant Toxicological and Medical Information

Cetirizine is a second-generation antihistamine used to relieve hay fever and allergy symptoms. It is available over the counter, commonly marketed as Zyrtec. Although designed to be less sedating, cetirizine does have some sedating properties. The therapeutic range is between 190 and 1,450 ng/mL; the elimination half-life is between 6.5 and 10 hours. FAA provides guidance on wait times before flying after using this medication; post-dose observation time is 48 hours and the medication is not for daily use.^{5,6}

Codeine is prescribed to relieve mild to moderate pain or to suppress coughing. It is often prescribed in combination with acetaminophen (commonly marketed as Tylenol with Codeine). Codeine is a narcotic medication and use carries a high risk of addiction, abuse, and misuse. It is an impairing medication and carries the warning that patients should not drive or operate dangerous machinery until they know how they will react to the medication. The plasma half-life of codeine is about three hours and its therapeutic range is 100 to 230 ng/mL. Codeine is

³ Rivaroxaban, marketed under the name Xarelto, is a blood thinner prescribed to treat and/or reduce the risk of blood clots that can cause stroke, myocardial infarction, deep vein thrombosis (DVT), and pulmonary embolism. [National Institutes of Health (NIH). U.S. National Library of Medicine (NLM). [DailyMed - XARELTO-rivaroxaban tablet, film coated \(nih.gov\)](#) Updated 4/15/21.]

⁴ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs.

Acetaminophen. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=2>

Ketorolac. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=344>

⁵ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Cetirizine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=131>

⁶ FAA. 7/2/21. [AllergyAntihistamineImmunotherapyMedication.pdf \(faa.gov\)](#)

metabolized mainly in the liver to *morphine* and norcodeine. About 10% of codeine is excreted unchanged in the urine.^{7,8,9}

Lamotrigine is a prescription medication indicated for treatment of bipolar disorder and adjunctive treatment of epilepsy. It is commonly marketed as Lamictal. The plasma half-life of lamotrigine is 12 to 62 hours and its therapeutic range is 400 to 3,500 ng/mL. Lamotrigine can have impairing performance effects including dizziness and drowsiness, and patients should be warned not to operate complex machinery while on the medication.^{10,11}

Pilot-rated Passenger

FAA Medical Certification File

According to his FAA medical certification file, at the time of the accident, the 63-year-old male pilot-rated passenger held a third class medical certificate with the limitation that he must have available glasses for near vision. On his most recent examination (3/2/20) he reported 5,650 total flight hours and was 72 inches tall and weighed 220 pounds. The pilot-rated passenger reported taking no medications and having no medical conditions. Medical examination reports dated back to 1985, with examinations occurring about every two years.

No toxicology results were available from the surviving pilot-rated passenger.

D. SUMMARY OF MEDICAL FINDINGS

Pilot

The 67-year-old male pilot was a Canadian national and had never applied for an FAA medical certificate. According to the TSB correspondence, the pilot's most recent medical examination was completed in May 2020. The pilot was issued a category 1 license with knowledge of a previous condition and knowledge of currently taking Xarelto (rivaroxabam). The pilot had a restriction that he was to have reading glasses available. According to the autopsy report, the pilot's cause of death was atlanto-occipital dislocation due to blunt force head and neck trauma due to airplane crash and the manner of death was accident. No significant natural disease was identified.

Toxicology testing detected cetirizine in the pilot's heart blood at 137 ng/mL and urine. Codeine was detected at 4 ng/mL in his heart blood and urine; morphine was detected in his urine. Lamotrigine was detected in the pilot's heart blood and urine. The non-sedating pain medications acetaminophen and ketorolac were detected in blood and urine; caffeine was detected in his blood.

⁷ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Codeine.

<https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=36>

⁸ NIH. NLM. [DailyMed - CODEINE SULFATE tablet \(nih.gov\)](#) Updated 3/15/21.

⁹ Oyler, JM, EJ Cone, RE Joseph Jr., MA Huestis. 2000. Identification of hydrocodone in human urine following controlled codeine administration. *Journal of Analytical Toxicology* 24:530-535.

¹⁰ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Lamotrigine.

<https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=234>

¹¹ NIH. NLM. [DailyMed - LAMOTRIGINE- lamotrigine tablet LAMOTRIGINE tablet \(nih.gov\)](#) Updated 4/30/21.

Pilot-rated Passenger

At the time of the accident, the 63-year-old male pilot-rated passenger held a third class FAA medical certificate with the limitation that he must have available glasses for near vision. At his last examination on 3/2/20, he reported no medications or medical conditions. There was no post-accident toxicology testing.