

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



WPR23FA044

MEDICAL

Specialist's Factual Report

May 8, 2023

A. ACCIDENT

Location: Banning, California
Date: 11/22/2022
Time: 18:24 Local
Airplane: Gallagher XLT-RG; N101BH

B. MEDICAL SPECIALIST

Specialist Michelle Watters, MD, PhD, MPH
National Transportation Safety Board, RE-1
Washington, DC

C. DETAILS OF THE INVESTIGATION

Purpose

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

Methods

The Federal Aviation Administration (FAA) medical case review, the pilot's autopsy report, and FAA Forensic Sciences Laboratory toxicology report¹ were reviewed. Other relevant medical and regulatory issues were reviewed.

D. FACTUAL INFORMATION—PILOT

1.0 FAA Medical Case Review

According to the FAA medical case review, at the time of the accident, the 55-year-old male pilot held a first class medical certificate with the limitation that he must possess glasses for near/intermediate vision. His most recent FAA medical certification exam was on 10/26/22 and at that time he reported he had accrued 14,300 total flight hours. He was 70 inches tall and weighed 245 pounds. He reported taking no medications and having a history of seasonal allergies.

2.0 Autopsy

According to the autopsy report from the Riverside County Sheriff-Coroner Office, Perris, California, the pilot's cause of death was blunt force trauma and

¹ The FAA Forensic Sciences Laboratory has the capability to test for more than 1,000 substances including toxins, common prescription and over-the-counter medications, and illicit drugs.
<https://jag.cami.jccbi.gov/toxicology/>

thermal exposure, and the manner of death was accident. No significant natural disease was identified by the forensic pathologist.

3.0 Toxicology

Toxicology testing performed for the sheriff-coroner's office detected diphenhydramine in the pilot's blood at 22 nanograms per milliliter (ng/mL). Toxicology testing performed by the FAA Forensic Sciences Laboratory detected diphenhydramine at 45 ng/mL in the pilot's blood and in his urine. Cetirizine was detected at 38 ng/mL in his blood and 1,644 ng/mL in his urine.

Diphenhydramine is a sedating antihistamine (commonly marketed as Benadryl) and is available over the counter in many products used to treat colds, allergies, and insomnia. Diphenhydramine carries the warning that use of the medication may impair mental and physical ability to perform potentially hazardous tasks, including driving or operating heavy machinery. The therapeutic range is 25 to 100 ng/mL and it has a half-life of 3 to 14 hours.² Diphenhydramine undergoes postmortem redistribution and central levels may be two to three times higher than peripheral levels.³ *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 than the first generation antihistamines, 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.⁴ FAA provides guidance on wait times before flying after using these antihistamines.^{5,6}

E. SUMMARY OF MEDICAL FACTS

The 55-year-old male pilot held a first class medical certificate with the limitation that he must possess glasses for near/intermediate vision. At his most recent FAA medical certification exam on 10/26/22, he reported taking no medications and having a history of seasonal allergies. According to the autopsy report, the pilot's cause of death was blunt force trauma and thermal exposure, and

² FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Diphenhydramine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=50>.

³ Han, E, E Kim, H Hong, S Jeong, J Kim, S In, H Chung, and S Lee. 2012 Evaluation of postmortem redistribution phenomena for commonly encountered drugs. *Forensic Sci Int.* 219(1-3):265-271.

⁴ FAA. Updated 1/16/19. Forensic Toxicology Drug Information.

Cetirizine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=131>

⁵ FAA. 11/13/19. What over-the-counter (OTC) medications can I take and still be safe to fly? OK-20-0302

https://www.faa.gov/licenses_certificates/medical_certification/media/OTCMedicationsforPilots.pdf

⁶ FAA. Updated 10/26/22. [AllergyAntihistamineImmunotherapyMedication.pdf \(faa.gov\)](#)

the manner of death was accident. No significant natural disease was identified. Toxicology testing detected diphenhydramine in the pilot's blood at 22 ng/mL and 45 ng/mL; diphenhydramine was also detected in his urine. Cetirizine was detected at 38 ng/mL in his blood and 1,644 ng/mL in his urine.

Submitted by:
Michelle Watters, MD, PhD, MPH
Medical Officer, RE-1