

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ANC23LA002

MEDICAL

Specialist's Factual Report

February 21, 2023

A. ACCIDENT

Location: Cordova, Alaska
Date: October 16, 2022
Time: 14:27 Local
Airplane: Piper PA-32-260; N3432W

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 and the pilot's autopsy and FAA Forensic Sciences Laboratory toxicology reports¹ 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 62-year-old male pilot held a second class medical certificate with the limitation that he must have available glasses for near vision. At his most recent FAA medical examination on 3/8/22, the pilot reported 15,800 total flight hours. He was 71 inches tall and weighed 210 pounds. He reported taking no medications and having no medical conditions. He had an 1/16/18 FAA letter of eligibility for a 2015 driving under the influence offense.

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/>

2.0 Autopsy

According to the autopsy report from the State Medical Examiner's Office, Anchorage, Alaska, the pilot's cause of death was multiple blunt force injuries, and the manner of death was accident. The medical examiner reported the pilot had 50% atherosclerotic narrowing of his left anterior descending coronary artery and 50-60% narrowing of his distal right coronary artery.

3.0 Toxicology

Toxicology testing performed for the medical examiner's office was negative for tested-for drugs of abuse in the pilot's heart blood. Toxicology testing performed by the FAA Forensic Sciences Laboratory identified amitriptyline in the pilot's subclavian blood at 135 nanograms per milliliter (ng/mL) and in his urine at 76 ng/mL. Amitriptyline's active metabolite nortriptyline was detected in his subclavian blood at 45 ng/mL and in his urine. The chronic nerve pain medication gabapentin and the metabolite of a muscle relaxant norcyclobenzaprine were detected in his urine, but not in his blood.² Glucose was detected in the pilot's urine at 1,491 milligrams per deciliter, but not in his vitreous fluid; his hemoglobin A1c was 5.8%.³

Amitriptyline, commonly marketed as Elavil, is a prescription medication indicated for the treatment of depression, eating disorders, and chronic nerve pain; it is known to have sedative effects. Amitriptyline carries the warning that use may impair the mental and physical ability to perform hazardous tasks. The therapeutic range of amitriptyline is 50 to 300 ng/mL. Amitriptyline has an average half-life of 30 to 50 hours; *nortriptyline*, its active metabolite, has a half-life of 18-44 hours and has a therapeutic range of 70 to 170 ng/mL.^{4,5} Like other tricyclic antidepressants, amitriptyline and nortriptyline undergo postmortem redistribution and central levels

² FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs.

Gabapentin. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=254>

Cyclobenzaprine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=133>

Norcyclobenzaprine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=372>

³ Hemoglobin A1C is a measure of the percentage of hemoglobin molecules that have a glucose molecule attached to them. The test measures the average blood glucose over the past three months. A normal A1C is below 5.7%, above 6.5% indicates diabetes. [National Institutes of Health. U.S. National Library of Medicine. MedlinePlus. A1C. <https://medlineplus.gov/a1c.html>. Page last updated 12/22/15.]

⁴ NIH. NLM. Updated 9/16/22. [DailyMed - AMITRIPTYLINE HYDROCHLORIDE tablet \(nih.gov\)](https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?id=202222)

⁵ Schulz, M, A Schmoldt, H Andresen-Streichert, and S Iwersen-Bergmann. 2020.

Revisited: Therapeutic and toxic blood concentrations of more than 1100 drugs and xenobiotics. Additional File 1. *Critical Care* 24(1):195 doi: 10.1186/s13054-020-02915-5.

may be two to three times higher than peripheral levels.⁶ Amitriptyline is not a medication that has been approved by FAA for treatment of depression in pilots.⁷

E. SUMMARY OF MEDICAL FACTS

The 62-year-old male pilot held a second class medical certificate with the limitation that he must have available glasses for near vision. At his most recent FAA medical examination on 3/8/22, he reported taking no medications and having no medical conditions. According to the autopsy report, the pilot's cause of death was multiple blunt force injuries, and the manner of death was accident. The medical examiner reported the pilot had 50% atherosclerotic narrowing of his left anterior descending coronary artery and 50-60% narrowing of his distal right coronary artery.

Toxicology testing detected amitriptyline in the pilot's subclavian blood at 135 nanograms per milliliter (ng/mL) and in his urine at 76 ng/mL. Amitriptyline's active metabolite nortriptyline was detected in his subclavian blood at 45 ng/mL and in his urine. Gabapentin and norcyclobenzaprine were detected in his urine, but not in his blood. Glucose was detected in the pilot's urine at 1,491 milligrams per deciliter, but not in his vitreous fluid; his hemoglobin A1C was 5.8%.

Submitted by:

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Medical Officer, RE-1

⁶ 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.

⁷ FAA. Last modified 7/23/18. Guide for Aviation Medical Examiners, Item 47. Psychiatric Conditions - Use of Antidepressant Medications. https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/app_process/exam_tech/item47/amd/antidepressants/