

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ANC22LA080

MEDICAL

Specialist's Factual Report

May 8, 2023

A. ACCIDENT

Location: Skwentna, Alaska
Date: 9/25/2022
Time: 13:00 Local
Airplane: Cessna 180A; N9728B

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 68-year-old female pilot was on BasicMed (6/18/22). Her most recent FAA medical certification exam was on 5/28/20 and at that time she reported she had accrued 679 total flight hours. She was 64 inches tall and weighed 145 pounds. She reported no medication use and having hay fever. The pilot had been issued a third class FAA medical certificate without limitation.

2.0 Autopsy

According to the autopsy report from the State Medical Examiner's Office, Anchorage, Alaska, the pilot's cause of death was blunt force injury of head with

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/>

subsequent asphyxia due to drowning, and the manner of death was accident. No significant natural disease was identified by the medical examiner.

3.0 Toxicology

Toxicology testing performed for the medical examiner's office was negative for ethanol and tested-for drugs in the pilot's femoral blood. FAA Forensic Sciences Laboratory detected the antianxiety medication diazepam in the pilot's femoral blood at 12 nanograms per milliliter (ng/mL) and her liver tissue. Diazepam's metabolite nordiazepam was detected in her femoral blood at 9 ng/mL and her liver tissue. The antidepressant venlafaxine and its metabolite o-desmethylvenlafaxine were detected in the pilot's femoral blood at 18 ng/mL and 112 ng/mL, respectively; both substances were also detected in her liver tissue. The high blood pressure medications metoprolol and timolol were detected in the pilot's liver tissue; metoprolol was also detected in her femoral blood, while the result for timolol in her femoral blood was inconclusive. These two medications are generally considered non-impairing.²

Diazepam, commonly marketed as Valium, is a sedating benzodiazepine available by prescription as a controlled substance and used to treat anxiety; it is also useful to help treat muscle spasms, alcohol withdrawal, and seizures. It is metabolized to the active metabolites *nordiazepam* and temazepam. Diazepam and its metabolites carry the warning that they may impair the mental and physical ability to perform hazardous tasks. Drowsiness, fatigue, and muscle weakness are commonly reported side effects. The therapeutic range of diazepam and nordiazepam is 100 to 2,000 ng/mL in the blood. Diazepam has a half-life of 21 to 82 hours; nordiazepam has a half-life of 25 to 200 hours.^{3,4}

Venlafaxine, commonly marketed as Effexor, is indicated for the treatment of depression, generalized anxiety disorder, social anxiety disorder, and panic disorder. O-desmethylvenlafaxine is an active metabolite of venlafaxine. Dizziness, tiredness, and insomnia are common adverse reactions to taking venlafaxine and its metabolites and they carry the warning that their use may impair the mental and physical ability to perform hazardous tasks. The therapeutic range for venlafaxine is 100 to 300 ng/mL and for o-desmethylvenlafaxine the range is 200 to 400 ng/mL. Venlafaxine has a half-

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

Metoprolol. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=171>

Timolol. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=198>

³ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs.

Diazepam. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=44>

Nordiazepam. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=85>

⁴ National Institutes of Health (NIH). U.S. National Library of Medicine (NLM). [DailyMed - DIAZEPAM tablet \(nih.gov\)](https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?id=20222). Updated 10/5/22.

life of 3 to 7 hours.^{5,6} Venlafaxine is not a medication that has been approved by FAA for treatment of depression in pilots.⁷

E. SUMMARY OF MEDICAL FACTS

The 68-year-old female pilot was on BasicMed (6/18/22). At her most recent FAA medical certification exam on 5/28/20, she reported no medication use and having hay fever. According to the autopsy, the pilot's cause of death was blunt force injury of head with subsequent asphyxia due to drowning, and the manner of death was accident. No significant natural disease was identified.

Toxicology testing detected diazepam in the pilot's femoral blood at 12 nanograms per milliliter (ng/mL) and her liver tissue. Diazepam's metabolite nordiazepam was detected in her femoral blood at 9 ng/mL and her liver tissue. Venlafaxine and its metabolite o-desmethylvenlafaxine were detected in the pilot's femoral blood at 18 ng/mL and 112 ng/mL, respectively; both substances were also detected in her liver tissue. The generally non-impairing high blood pressure medications metoprolol and timolol were detected in the pilot's femoral blood and/or liver tissue.

Submitted by:

Michelle Watters, MD, PhD, MPH
Medical Officer, RE-1

⁵ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs.

Venlafaxine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=205>

O-desmethylvenlafaxine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=137>

⁶ NIH. NLM. [DailyMed - VENLAFAXINE HYDROCHLORIDE capsule, extended release \(nih.gov\)](#) Updated 10/15/22.

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/