

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



WPR22FA197

MEDICAL

Specialist's Factual Report

April 5, 2023

A. ACCIDENT

Location: Oceanside, California
Date: June 3, 2022
Time: 13:47 Local
Airplane: Cessna 208B; N7581F

B. MEDICAL SPECIALIST

Specialist Michelle Watters, MD, PhD, MPH
National Transportation Safety Board, RE-1
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C. DETAILS OF THE INVESTIGATION

Purpose

This investigation was performed to evaluate the left- and right-seated pilots 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 left-seated pilot's autopsy and FAA Forensic Sciences Laboratory toxicology reports¹ were reviewed. Post-accident medical records were obtained for the left- and right-seated pilots. Other relevant medical and regulatory issues were reviewed.

D. FACTUAL INFORMATION

1.0 Left-seated Pilot

1.1 FAA Medical Case Review

According to the FAA medical case review, at the time of the accident, the 24-year-old female left-seated pilot held a first class medical certificate without limitation. At her most recent FAA medical certification examination on 6/11/21, she reported 530 total flight hours and was 69 inches tall and weighed 109 pounds. She reported taking potassium dietary supplements. She had a 1/25/22 letter of eligibility for her history of hypokalemia (low potassium).

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/>

1.2 Autopsy

According to the autopsy report from the San Diego County Medical Examiner, San Diego, California, the cause of death of the left-seated pilot was blunt force injuries, and the manner of death was accident. There was evidence of medical therapy including an endotracheal tube and an intravascular line. The body was described as normally developed and well-nourished; her weight was 117 pounds. No significant natural disease was identified.

1.3 Toxicology

Toxicology testing performed for the county coroner on the left-seated pilot's chest blood detected the anesthetic ketamine and local anesthetic lidocaine. Ketamine was detected at 1,300 nanograms per milliliter (ng/mL) in peripheral blood. The potassium level in her vitreous fluid was 9.4 millimole per liter. Toxicology testing performed by the FAA Forensic Sciences Laboratory detected ketamine in the left-seated pilot's cavity blood at 1,464 ng/mL and in her liver tissue. Norketamine, the active metabolite of ketamine, was detected in her liver tissue but not in her cavity blood. Lidocaine was detected in her cavity blood but was inconclusive in her liver tissue. The non-sedating antihistamine fexofenadine, commonly marketed as Allegra, and its major metabolite azacyclonol were detected in the left-seated pilot's cavity blood and liver tissue.²

Ketamine

The impairing medication ketamine is an anesthetic used for pain management; it is also abused as a recreational drug for its psychedelic and dissociative effects. Effects include decreased awareness, increased reaction time, cognitive impairment, sedation, hallucinations, out-of-body experiences, and lack of coordination. Ketamine's therapeutic range is 100 to 2,200 ng/mL and it has a half-life of 2 to 4 hours. Ketamine can be detected in the urine for about 3 days. Norketamine is a metabolite of ketamine and produces similar effects to ketamine.^{3,4}

1.4 Post-accident Medical Records

Post-accident medical records were obtained for the left-seated pilot. The left-seated pilot went into cardiac arrest after being extricated from the airplane and

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

Lidocaine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=148>

Fexofenadine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=210>

Azacyclonol. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=16>

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

Ketamine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=82>

Norketamine. <http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=303>

⁴ National Highway Traffic Safety Administration (NHTSA). April 2014 (revised). Drugs and Human Performance Fact Sheets. Ketamine. [809725-drugshumanperformfs.pdf \(nhtsa.gov\)](https://www.nhtsa.gov/sites/nhtsa/files/809725-drugshumanperformfs.pdf)

received cardiopulmonary resuscitation. She was intubated by emergency medical services using rapid sequence intubation. She was pronounced dead about five minutes after her arrival at the hospital.

2.0 Right-seated Pilot

2.1 FAA Medical Case Review

According to the FAA medical case review, at the time of the accident, the 52-year-old male right-seated 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 certification examination on 3/29/22, he reported 6,880 flying hours and was 72 inches tall and weighed 206 pounds. No significant medical concerns were identified.

2.2 Toxicology

No toxicology specimens were obtained for FAA Forensic Sciences Laboratory testing.

2.3 Post-Accident Medical Records

Post-accident medical records were obtained for the right-seated pilot. He was brought to the hospital by ambulance and had diagnoses of subdural hemorrhage with loss of consciousness, concussion with loss of consciousness for less than 30 minutes, lung contusion, multiple lacerations, and fractures to the right hip, left forearm, multiple left ribs, and multiple facial bones. He was discharged home from the hospital after 10 days.

E. SUMMARY OF MEDICAL FACTS

The 24-year-old female left-seated pilot held a first class medical certificate without limitation. At her most recent FAA medical certification examination on 6/11/21, she reported taking potassium and had a 1/25/22 letter of eligibility for her history of hypokalemia (low potassium). According to the autopsy report, the cause of death of the left-seated pilot was blunt force injuries, and the manner of death was accident. No significant natural disease was identified.

Toxicology testing detected ketamine at 1,300 nanograms per milliliter (ng/mL) in the left-seated pilot's peripheral blood, at 1,464 ng/mL in her cavity blood, and in her liver tissue; norketamine was detected in her liver tissue. Lidocaine was detected in her cavity blood. The non-sedating antihistamine fexofenadine, and its metabolite azacyclonol were detected in the left-seated pilot's cavity blood and liver tissue. Post-accident medical records report that the left-seated pilot received

cardiopulmonary resuscitation and rapid sequence intubation before transport to the hospital.

The 52-year-old male right-seated 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 certification examination on 3/29/22, no significant medical concerns were identified. Post-accident medical records show that the right-seated pilot had diagnoses of subdural hemorrhage with loss of consciousness, concussion with loss of consciousness for less than 30 minutes, lung contusion, multiple lacerations, and fractures to the right hip, left forearm, multiple left ribs, and multiple facial bones. The right-seated pilot was discharged home from the hospital after 10 days.

Submitted by:

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