



# NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering  
Washington, DC

## **Medical Factual Report** **June 7, 2022**

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Medical Officer

### **A. ACCIDENT: ERA22FA058 – Branchville, New Jersey**

Date/Time: November 11, 2021; 10:48 a.m. (EST)  
Aircraft: Cessna 172S, N90559  
Injuries: 2 fatal  
Flight conducted under Part 91 instructional 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 certified flight instructor (CFI) and private 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 CFI's and private pilot's autopsy and FAA Forensic Sciences Laboratory toxicology<sup>1</sup> reports were reviewed. Other pertinent scientific and regulatory issues were reviewed.

#### *Certified flight instructor (CFI)*

##### FAA Medical Case Review

According to the FAA medical case review, the 54-year-old male CFI held a second class medical certificate by special issuance for obstructive sleep apnea with CPAP (continuous positive airway pressure) use with the limitation that he must wear corrective lenses. His most recent FAA medical certification exam was on 11/22/20 and at that time he reported he had accrued 14,750 total flight hours. He was 71 inches tall and weighed 270 pounds. He reported taking no medications. No other significant medical concerns or issues were identified.

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<sup>1</sup> The FAA Forensic Sciences Laboratory has the capability to test for more than 1,300 substances including toxins, common prescription and over-the-counter medications as well as illicit drugs. <https://jag.cami.jccbi.gov/toxicology/>

### Autopsy

According to the autopsy report by the County of Morris Medical Examiner, Morristown, New Jersey, the cause of death in the CFI was multiple injuries and the manner of death was accident. The autopsy was limited to an external examination; it was noted that the family objected to an autopsy, so no internal examination was performed.

### Toxicology

Toxicology testing performed by the FAA Forensic Sciences laboratory detected the primary psychoactive compound of cannabis, tetrahydrocannabinol (THC), in the CFI's blood at 1.5 nanograms per milliliter (ng/mL); THC was not detected in his vitreous fluid. THC's inactive metabolite carboxy-delta-9-tetrahydrocannabinol (THC-COOH) was not detected in the CFI's vitreous fluid; the specimen was unsuitable for the analysis of THC-COOH in his blood.

Toxicology testing performed for the medical examiner's office was positive for THC at 9.3 ng/mL and THC-COOH at 2.7 ng/mL in the CFI's peripheral blood. His peripheral blood was also positive for caffeine and cotinine (a metabolite of nicotine).

### *Cannabis*

The marijuana plant (*Cannabis species*) contains chemicals called cannabinoids; tetrahydrocannabinol (THC) is the primary psychoactive cannabinoid compound. THC's mood-altering effects include euphoria and relaxation. In addition, marijuana causes alterations in motor behavior, time and space perception, and cognition. Significant performance impairments are usually observed for at least 1-2 hours following marijuana use, and residual effects have been reported up to 24 hours.<sup>2</sup>

THC is rapidly metabolized, but the rate of metabolism is not linear and depends on the means of ingestion (smoking, oil, and edibles), potency of the product, frequency of use, and user characteristics. The primary metabolite, 11-hydroxy-delta-9-THC, is equally psychoactive, but is rapidly metabolized to the non-psychoactive metabolite THC-COOH. THC is fat soluble, so is stored in fatty tissues and can be released back into the blood long after consumption. So, while the psychoactive effects may last a few hours, THC can be detected in the body for days or weeks. Very little THC is excreted in urine. Instead, THC-COOH can be found in urine days to weeks after the last use of the drug. Thus, both blood and urine test results do not necessarily reflect recent use and cannot be used to prove that the user was under the influence of the drug at the time of testing.<sup>3</sup>

### *Private pilot*

#### FAA Medical Case Review

According to the FAA medical case review, the 49-year-old male private pilot held a third class medical certificate with the limitation that he must have available glasses for near vision. His most recent FAA medical certification exam was on 4/2/21 and at that time he reported he had

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<sup>2</sup> National Highway Traffic Safety Administration. April 2014 (revised). Drugs and Human Performance Fact Sheets. Cannabis/Marijuana. <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drugshumanperformfs.pdf>

<sup>3</sup> Compton, R. July 2017. Marijuana-Impaired Driving - A Report to Congress. (DOT HS 812 440). Washington, DC: National Highway Traffic Safety Administration. <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812440-marijuana-impaired-driving-report-to-congress.pdf>

accrued 272 total flight hours. He was 74 inches tall and weighed 185 pounds. He reported taking no medications. No significant medical concerns or issues were identified.

#### Autopsy

According to the autopsy report by the County of Morris Medical Examiner, Morristown, New Jersey, the cause of death in the private pilot was multiple injuries and the manner of death was accident. No significant natural disease was identified.

#### Toxicology

Toxicology testing performed by the FAA Forensic Sciences laboratory was negative for ethanol and tested for drugs in the private pilot's blood. Toxicology testing performed for the medical examiner's office was positive for caffeine in the private pilot's blood.

### **D. SUMMARY OF MEDICAL FINDINGS**

#### *Certified flight instructor*

The 54-year-old male CFI held a second class medical certificate by special issuance for obstructive sleep apnea with CPAP use with the limitation that he must wear corrective lenses. According to the autopsy, the cause of the CFI's death was multiple injuries and the manner of death was accident. No internal examination was performed.

Toxicological testing detected THC in the CFI's blood at 1.5 and 9.3 ng/mL. THC-COOH was detected in one blood specimen at 2.7 ng/mL, the other lab found the specimen unsuitable for testing. THC and THC-COOH were not detected in vitreous fluid. The CFI's peripheral blood was also positive for caffeine and cotinine.

#### *Private pilot*

The 49-year-old male private pilot held a third class medical certificate with the limitation that he must have available glasses for near vision. According to the autopsy, the cause of the private pilot's death was multiple injuries and the manner of death was accident. No significant natural disease was identified by the medical examiner. Other than caffeine, toxicological testing did not detect any ethanol or tested-for-drugs in the private pilot's blood.