



# **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Research and Engineering  
Washington, DC

## **Medical Factual Report** **October 29, 2021**

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Medical Officer

### **A. ACCIDENT: CEN21LA089; Bossier City, Louisiana**

Date/Time: December 16, 2020; 4:39 a.m. (CST)  
Aircraft: Piper PA-28-180; N55168  
Injuries: 2 Fatal  
Flight Conducted under Part 91 personal 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 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 student pilot's autopsy report, record of conversation with the student pilot's father,<sup>1</sup> and the Forensic Sciences Laboratory toxicology report<sup>2</sup> were reviewed. Other pertinent scientific and regulatory issues were reviewed.

#### **FAA Medical Case Review**

According to the FAA medical case review, the 18-year-old male student pilot held a third class medical certificate without limitations. At the time of his most recent and only FAA medical certification examination (6/30/20), he reported no flight hours and was 71 inches tall and weighed 146 pounds. He reported the use of no medications and having no medical concerns.

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<sup>1</sup> The record of conversation is available in the docket for this investigation.

<sup>2</sup> See <https://jag.cami.jccbi.gov/toxicology/> for a complete list of tested-for substances.

### Autopsy

According to the autopsy report from the Bossier Parish Coroner's Office, Louisiana, the student pilot's death was caused by multiple blunt force injuries. No significant natural disease was identified.

### Record of Conversation

The investigator in charge (IIC) spoke to the student pilot's father. The father reported that the student pilot had been taking the prescription medication Vyvanse for attention deficit hyperactivity disorder (ADHD) "for a while."<sup>3</sup>

### Toxicology

FAA Forensic Sciences Laboratory toxicology testing detected the stimulant amphetamine in the student pilot's blood at 346 nanograms per milliliter (ng/mL) and urine at 218 ng/mL. The sedating antihistamine cetirizine was detected in the student pilot's urine, but not in his blood. The non-impairing gastric reflux medicine metoclopramide and the non-impairing decongestant phenylpropanolamine were detected in the student pilot's blood and urine.<sup>4</sup>

### Relevant Toxicological and Medical Information

*Amphetamine* is a prescription medication used for the treatment of ADHD, narcolepsy, and obesity. In some preparations, the prescription drug is metabolized to amphetamine and is considered a prodrug; commonly marketed names include Adderall, Dexedrine, and Vyvanse. Therapeutic concentrations of amphetamine ranges from 20 to 100 ng/mL; concentrations greater than 200 ng/mL represent abuse. The half-life is between 10 to 13 hours. It is a central nervous stimulant and widely used drug of abuse. Amphetamine carries a boxed warning about its potential for abuse and drug dependence. It also carries warnings about an increased risk of sudden death and the potential for mental health and behavioral changes. At lower doses, amphetamine has few effects on cognitive functioning; risk-taking increases at higher doses.<sup>5,6,7</sup>

ADHD is a mental health disorder that features inattention, impulsivity, and hyperactivity. It is also associated with impairments in motor inhibition, reaction time, visual-motor coordination, executive functioning, decision-making, and rule-governed behavior. Adolescents and young adults with ADHD are 2 to 4 times more likely to have been the driver in a motor vehicle

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<sup>3</sup> National Institutes of Health (NIH). U.S. National Library of Medicine (NLM). Updated 8/6/21. [DailyMed - VYVANSE- lisdexamfetamine dimesylate capsule VYVANSE- lisdexamfetamine dimesylate tablet, chewable \(nih.gov\)](https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?id=202222)

<sup>4</sup> FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Metoclopramide. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=170>  
Phenylpropanolamine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=108>

<sup>5</sup> FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Amphetamine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=11>

<sup>6</sup> NIH.NLM. Updated 11/26/19. [DailyMed - AMPHETAMINE SULFATE- amphetamine tablet \(nih.gov\)](https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?id=202222).

<sup>7</sup> National Highway Traffic Safety Administration. April 2014. Drugs and Human Performance Fact Sheets. Methamphetamine (and Amphetamine). <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drugshumanperformfs.pdf>

accident than peers without the illness.<sup>8,9</sup> Results of a recent systematic review indicate that the use of therapeutic levels of stimulants to treat ADHD did not worsen driving performance and generally improved driving performance in ADHD patients.<sup>10</sup>

*Cetirizine* is a second-generation antihistamine used to relief hay fever and allergy symptoms. It is available over the counter, commonly marketed as Zyrtec. Although designed to be less sedating, 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. FAA provides guidance on wait times before flying after using this medication.<sup>11,12</sup>

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

The 18-year-old male student pilot held a third class medical certificate without limitations. At his most recent and only FAA medical certification exam (6/30/20), he reported the use of no medications and having no medical concerns. According to the student pilot's father, the student pilot was taking Vyvanse, a prodrug of amphetamine, for ADHD. According to the autopsy report from the Bossier Parish Coroner's Office, the student pilot's death was caused by multiple blunt force injuries. No significant natural disease was identified.

Toxicology testing detected amphetamine in the student pilot's blood at 346 ng/mL and urine at 218 ng/mL. Cetirizine was detected in his urine and metoclopramide and phenylpropanolamine were detected in the student pilot's blood and urine.

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<sup>8</sup> Barkley, RA, KR Murphy and D Kwasnik. 1996. Motor vehicle driving performance and risks in young adults with ADHD. *Pediatrics* 98:1089-1095.

<sup>9</sup> Aduen PA, MJ Kofler, DJ Cox, DE Sarver, and E Lunsford. 2015. Motor vehicle driving in high incidence psychiatric disability: comparison of drivers with ADHD, depression, and no known psychopathology. *Journal of Psychiatric Research* 64:59-66.

<sup>10</sup> Gobbo MA and MR Louzã. 2014. Influence of stimulant and non-stimulant drug treatment on driving performance in patients with attention deficit hyperactivity disorder: a systematic review. *European Neuropsychopharmacology* 24(9):1425-43.

<sup>11</sup> FAA. Updated 1/16/19. Forensic Toxicology Drug Information. Cetirizine.  
<https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=131>

<sup>12</sup> 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](https://www.faa.gov/licenses_certificates/medical_certification/media/OTCMedicationsforPilots.pdf)