

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ERA23FA048

MEDICAL

Specialist's Factual Report

February 14, 2023

A. ACCIDENT

Location: Harlan, Kentucky
Date: 11/3/2022
Time: 10:09 Local
Airplane: Beech A36; N84R

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 55-year-old male pilot was on BasicMed (4/12/21). His most recent FAA medical certification exam was on 11/9/15 where he was issued a third class medical certificate with the limitation that he must wear corrective lenses. At that exam, the pilot was 69 inches tall and weighed 191 pounds and reported having 2,315 total flight hours and taking omeprazole for gastric reflux. In 2001, the pilot received a special authorization for nephrotic syndrome.

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 Office of the State Medical Examiner, Frankfort, Kentucky, the pilot's cause of death was extensive blunt force injuries and thermal burns, and the manner of death was accident. No significant natural disease was identified.

3.0 Toxicology

Toxicology testing performed for the coroner's office was positive for methamphetamine in the pilot's brain tissue. Toxicology testing by the FAA Forensic Sciences Laboratory detected methamphetamine in the pilots' brain tissue at 40 nanograms per gram (ng/gm) and in his lung and muscle tissue; results were inconclusive in his liver tissue and his kidney tissue was unsuitable for analysis. The stimulant phentermine was detected in his liver, brain, kidney, muscle, and lung tissue. The sedating antihistamine chlorpheniramine and the non-sedating cough suppressant dextromethorphan and its metabolite dextrorphan were detected in the pilot's liver and muscle tissue.² No blood specimens were available for analysis.

Information on Detected Substances

Methamphetamine is a Schedule II controlled substance that is a central nervous system stimulant. It is medically indicated to treat attention deficit hyperactivity disorder (ADHD), narcolepsy, and obesity. It's commonly marketed as Desoxyn. The usual effective dose is 20 to 25 milligrams (mg) per day. Methamphetamine has a high potential for abuse, and providers are cautioned to sparingly prescribe the medication and not to prescribe methamphetamine to combat fatigue or replace rest in normal persons. Patients should be informed that the use of methamphetamine may impair their ability to engage in hazardous activities such as driving a motor vehicle.^{3,4} Recreationally, methamphetamine is abused for its euphoric effects and to increase alertness and relieve fatigue. Recreational users seeking the intense euphoria produced by higher levels snort, smoke, or inject the drug.⁵ Oral doses of methamphetamine prescribed for indicated medical conditions and dosages produce blood concentrations in the range of 20 to

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

Dextromethorphan. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=42>

Dextrorphan. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=43>

³ Food and Drug Administration (FDA). Drugs@FDA: FDA Approved Drugs. Medication Guide. Desoxyn (methamphetamine hydrochloride). Revised May 2017.

https://www.accessdata.fda.gov/drugsatfda_docs/label/2017/005378s034lbl.pdf

⁴ National Institutes of Health (NIH). U.S. National Library of Medicine (NLM). Updated 8/5/22. [DailyMed - METHAMPHETAMINE HYDROCHLORIDE tablet \(nih.gov\)](https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?id=68752)

⁵ National Highway Traffic Safety Administration (NHTSA). April 2014 (Revised). Drugs and Human Performance Fact Sheets. Methamphetamine (and Amphetamine). <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drugshumanperformfs.pdf>

50 nanograms per milliliter (ng/mL). Methamphetamine is metabolized to amphetamine. Methamphetamine's elimination half-life is between 6 to 15 hours.⁶

Phentermine is a Schedule IV prescription medication indicated for treating obesity in patients with a body mass index 30 kilograms per meter squared or greater. Phentermine is a stimulant and has similar activity to amphetamine. There is a risk for abuse and dependence and so should be only prescribed as a short-term adjunct for weight reduction. Adverse reactions can include overstimulation, dizziness, insomnia, tremor, and headache. Phentermine may impair the ability to operate machinery or drive a motor vehicle. Its therapeutic range is 180 to 510 ng/mL and its half-life is 19 to 24 hours.^{7,8} FAA does not allow a medical certificate to be issued if the pilot is using phentermine.⁹

Chlorpheniramine is a sedating antihistamine available over the counter to temporarily relieve symptoms of allergies and colds such as runny nose or watery eyes. The therapeutic range is 10 to 40 ng/mL, and it has a half-life of 12 to 43 hours.¹⁰ Chlorpheniramine and *dextromethorphan* are often sold in combination in over-the-counter cough and cold remedies, for example Coricidin. Product packaging for chlorpheniramine includes the warning that drowsiness may occur and to use caution when driving a motor vehicle or operating machinery.¹¹ FAA provides guidance on wait times before flying after using this medication; post-dose observation time is 60 hours, and the medication is not for daily use.¹²

E. SUMMARY OF MEDICAL FACTS

The 55-year-old male pilot was on BasicMed (4/12/21). At his most recent FAA medical certification exam on 11/9/15, he reported taking omeprazole for gastric reflux. According to the autopsy, the pilot's cause of death was extensive blunt force injuries and thermal burns, and the manner of death was accident. No significant natural disease was identified.

⁶ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs.

Methamphetamine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=161>

⁷ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Phentermine.

<https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=107>

⁸ NIH. NLM. Updated 5/12/21. [DailyMed - PHENTERMINE HYDROCHLORIDE tablet PHENTERMINE HYDROCHLORIDE capsule \(nih.gov\)](https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=8ffa168c-fe8a-4cd0-978d-c23678171e3f)

⁹ FAA. 11/23/22. *Guide for Aviation Medical Examiners*. Pharmaceuticals (Therapeutic Medications) Do Not Issue - Do Not Fly.

https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/pharm/dni_dnf/

¹⁰ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Chlorpheniramine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=29>

¹¹ NIH NLM. DailyMed. Chlorpheniramine. Updated 4/23/19. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=8ffa168c-fe8a-4cd0-978d-c23678171e3f>

¹² FAA. Updated 10/26/22. [AllergyAntihistamineImmunotherapyMedication.pdf \(faa.gov\)](https://www.faa.gov/air_traffic/tfaa/AllergyAntihistamineImmunotherapyMedication.pdf)

Toxicology testing detected methamphetamine in the pilots' brain tissue at 40 nanograms per gram (ng/gm) and in his lung and muscle tissue; results were inconclusive in his liver tissue and his kidney tissue was unsuitable for analysis. Phentermine was detected in his liver, brain, kidney, muscle, and lung tissue. Chlorpheniramine, dextromethorphan, and its metabolite dextrorphan were detected in the pilot's liver and muscle tissue.

Submitted by:

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