



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

February 2, 2022

Mary Pat McKay, MD, MPH
Chief Medical Officer

A. ACCIDENT: CEN21LA107; Cash, AR

Date and time: January 4, 2021

Injuries: 2 fatal

B. GROUP IDENTIFICATION

No group was formed for the medical evaluation in this accident.

C. DETAILS OF INVESTIGATION

1. Purpose

This investigation was performed to evaluate the pilot for medical conditions, the use of medications/illicit drugs, and the presence of toxins.

2. Methods

The FAA medical case review, autopsy report, toxicology findings, and the investigator's preliminary report were reviewed. The case was discussed with the investigator-in-charge. Relevant regulation and medical literature were reviewed as appropriate.

FAA Medical Case Review

According to the FAA medical case review, the 52-year-old male pilot had reported 775 total as of his last exam, dated 7/27/2020. At that time he was 69 inches tall and weighed 182 pounds. He had previously reported occasional headaches to the FAA but reported no medication use. No significant abnormalities were identified and he was issued a third class medical certificate without limitations.

Autopsy

According to the autopsy issued by the Arkansas State Crime Laboratory the cause of death was multiple blunt force injuries and the manner of death was accident. No significant natural disease was identified.

Toxicology

Toxicology tests performed by the FAA Forensic Sciences Laboratory identified ethanol at a variety of levels in blood samples, but none in liver. N-propanol was also identified in the blood samples. In addition, butalbital was identified at 21,493 ng/mL in blood and 11,617 ng/g in liver. Temazepam (72 ng/ml) and its psychoactive metabolite oxazepam (12 ng/ml) were identified in blood and also in liver. Benzoylcegonine, an inactive metabolite of cocaine, and acetaminophen were also identified in blood and liver.

Substance descriptions

Ethanol is the intoxicant commonly found in beer, wine, and liquor. It acts as a central nervous system depressant. After ingestion, at low doses, it impairs judgment, psychomotor functioning, and vigilance; at higher doses it can cause coma and death. The effects of ethanol on aviators are generally well understood; it significantly impairs pilots' performance, even at very low levels.¹ After absorption, ethanol is quickly distributed throughout the body's tissues and fluids quite uniformly. The distribution pattern parallels the water content and blood supply of each organ. Ethanol may also be produced in the body fluids and tissues after death by microbial activity.² N-propanol is another type of alcohol that can be produced in tissues after death.

Butalbital is an intermediate acting barbiturate commonly sold in combination with acetaminophen (an analgesic often marketed with the name Tylenol) and caffeine to treat headaches. It is available as Schedule III controlled substance.³ Butalbital carries this warning, "Butalbital is habit-forming and potentially abusable. Consequently, the extended use of this product is not recommended." In addition the drug information states, "This product may impair mental and/or physical abilities required for the performance of potentially hazardous tasks such as driving a car or operating machinery. Such tasks should be avoided while taking this

¹ Cook, C.C., Alcohol and aviation. *Addiction* (Abingdon, England), 1997. 92(5): p. 539-555.

² Federal Aviation Administration. Forensic Toxicology Drug Information. Ethanol. <http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=60> Accessed 03/02/2015

³ Controlled substances are those that have been identified by the Drug Enforcement Administration as having the potential for abuse and dependence. Substances are placed in their respective schedules (I-V) based on whether they have a currently accepted medical use in treatment in the United States, their relative abuse potential, and likelihood of causing dependence when abused. Schedule I substances are not legally available because of limited medical use and high risk of abuse and dependence; Schedule II substances have a high potential for abuse which may lead to severe psychological or physical dependence. As the number of the Schedule goes up, the abuse and dependence potential goes down.

product. Alcohol and other CNS depressants may produce an additive central nervous system depression when taken with this combination product, and should be avoided.”⁴ The usual therapeutic range is between 1,000 and 10,000 ng/ml.⁵

Temazepam is a sedating benzodiazepine and oxazepam is an active metabolite; both are available as Schedule IV controlled substances. Temazepam is indicated for the short term treatment of insomnia (7-10 days). Temazepam carries warnings about concomitant use with other central nervous system depressants.⁶ The usual blood levels for effects from the drug used by itself are between 200 and 1000 ng/ml.⁷

Benzoylecgonine is an inactive metabolite of cocaine but its presence indicates cocaine use in the hours to days before the crash.

D. SUMMARY OF MEDICAL FINDINGS

The 52-year-old male pilot had reported occasional headaches to the FAA but reported no medication use.

According to the autopsy issued by the Arkansas State Crime Laboratory the cause of death was multiple blunt force injuries and the manner of death was accident. No significant natural disease was identified.

Toxicology tests performed by the FAA Forensic Sciences Laboratory identified ethanol at a variety of levels in blood samples, but none in liver. N-propanol was also identified in the blood samples. In addition, butalbital was identified at 21,493 ng/ml in blood and 11,617 ng/g in liver. Temazepam (72 ng/ml) and its psychoactive metabolite oxazepam (12 ng/ml) were identified in blood and also in liver. Benzoylecgonine, an inactive metabolite of cocaine, and acetaminophen were also identified in blood and liver.

⁴ National Institutes of Health. US National Library of Medicine. DailyMed. Butalbital, acetaminophen, and caffeine. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2407efce-b77e-4072-bc4b-62c789d01e1a> Accessed 1/31/2022.

⁵ Federal Aviation Administration. Forensic Toxicology Drug Information. Butalbital. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=22> Accessed 1/31/2022.

⁶ National Institutes of Health. US National Library of Medicine. DailyMed. Temazepam. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=a4370eb4-b00d-4247-af8d-980e59fbbec6> Accessed 1/31/2022.

⁷ Federal Aviation Administration. Forensic Toxicology Drug Information. Temazepam <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=193> Accessed 1/31/2022.

FORENSIC TOXICOLOGY REPORT



FAA Civil Aerospace Medical Institute
Bioaeronautical Sciences Research Branch, Forensic Sciences
P.O. Box 25082, Oklahoma City, Oklahoma 73125
Ph: 405-954-6254, Fax: 405-954-3705



March 19, 2021

NAME [REDACTED]
LOCATION Cash, AR
DATE OF ACCIDENT 1/4/2021

CAMI # [REDACTED]
MODE Aviation
DATE RECEIVED 1/8/2021

NTSB # CEN21LA107
N # 325GC
STATUS FATAL

SPECIMENS Bile, Blood, Brain, Heart, Kidney, Liver, Lung, Muscle, Spleen

PUTREFACTION Yes

Screening tests employed

Blood - Carboxyhemoglobin (UV/VIS)
Lung - Volatiles (HS GC/FID)
Liver - Volatiles (HS GC/FID)
Blood - Volatiles (HS GC/FID)
Blood - Drugs of abuse (Immunoassay)
Liver - General drug screen (LC/MS, GC/MS)
Blood - General drug screen (LC/MS, GC/MS)

<u>Analyte</u>	<u>Result</u>	<u>Specimen</u>	<u>Instrument</u>
Carboxyhemoglobin	Unsuitable	Blood	UV/VIS
Ethanol	33 (mg/dL, mg/hg)	Blood #1	HSGC/FID
Ethanol	58 (mg/dL, mg/hg)	Blood #5	HSGC/FID
Ethanol	Not Detected	Liver	HSGC/FID
Ethanol	18 (mg/dL, mg/hg)	Lung	HSGC/FID
Propanol (N-)	Detected	Blood #1	HSGC/FID
Propanol (N-)	Detected	Blood #5	HSGC/FID
Butalbital	21493 (ng/mL, ng/g)	Blood	GC/MS
Butalbital	11617 (ng/mL, ng/g)	Liver	GC/MS
Oxazepam	12 (ng/mL, ng/g)	Blood	LC/MS
Oxazepam	57 (ng/mL, ng/g)	Liver	LC/MS
Temazepam	72 (ng/mL, ng/g)	Blood	LC/MS
Temazepam	304 (ng/mL, ng/g)	Liver	LC/MS

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March 19, 2021

CONTINUATION

CAMI #	NAME		
<u>Analyte</u>	<u>Result</u>	<u>Specimen</u>	<u>Instrument</u>
Benzoylcegonine	390 (ng/mL, ng/g)	Blood	GC/MS
Benzoylcegonine	538 (ng/mL, ng/g)	Liver	GC/MS
Acetaminophen	Detected	Blood	LC/MS
Acetaminophen	Detected	Liver	LC/MS

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Russell Lewis, Ph.D., F-ABFT
Supervisor, Forensic Sciences
Bioaeronautical Sci. Research Lab
CAMI, FAA

This record may be releasable under the FOIA request 15 days after signature date, unless FOIA exemptions apply.

Results listed in this report relate to tested specimen(s) only. See Forensic Toxicology web site for testing methodology and cutoffs as well as drug, FOIA, and contact information.

<http://www.faa.gov/go/toxlab>

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February 24, 2021

NAME [REDACTED]

CAMI # [REDACTED]

NTSB # CEN21LA107

LOCATION Cash, AR

MODE Aviation

N # 325GC

DATE OF ACCIDENT 1/4/2021

DATE RECEIVED 1/8/2021

STATUS FATAL

SPECIMENS Bile, Blood (Heart), Brain, Heart, Kidney, Liver, Lung, Muscle, Spleen, Vitreous

PUTREFACTION Yes

Screening tests employed

Blood (Heart) - Carboxyhemoglobin (UV/VIS)
Muscle - Volatiles (HS GC/FID)
Brain - Volatiles (HS GC/FID)
Vitreous - Glucose (Chemical Analyzer)
Liver - Drugs of abuse (Immunoassay)
Muscle - General drug screen (LC/MS, GC/MS)
Liver - General drug screen (LC/MS, GC/MS)

<u>Analyte</u>	<u>Result</u>	<u>Specimen</u>	<u>Instrument</u>
Carboxyhemoglobin	Not Detected	Blood (Heart)	UV/VIS
Ethanol	11 (mg/dL, mg/hg)	Muscle	HSGC/FID
Ethanol	Not Detected	Brain	HSGC/FID
Glucose	42 (mg/dL)	Vitreous	Analyzer
Sertraline	81 (ng/mL, ng/g)	Blood (Heart)	GC/MS
Sertraline	Detected	Liver	GC/MS
Desmethylsertraline	108 (ng/mL, ng/g)	Blood (Heart)	GC/MS
Desmethylsertraline	Detected	Liver	GC/MS

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