

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



CEN23FA183

MEDICAL

Specialist's Factual Report

March 3, 2025

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A INCIDENT

Location: Brady, Texas
Date: May 14, 2023

B MEDICAL SPECIALIST

Specialist JE Tuttle MD MHA FACS
National Transportation Safety Board
Washington, DC

C DETAILS OF THE INVESTIGATION

1.0 Purpose

This investigation was performed to evaluate the pilot for potentially impairing medical conditions and substances.

2.0 Methods

The final Federal Aviation Administration (FAA) medical case review, and the pilot's pre-event personal medical records, autopsy report, and toxicology report were reviewed.

Selected NTSB investigator reports, and relevant regulation and medical literature were also reviewed.

D FACTUAL INFORMATION

1.1 FAA Medical Case Review

According to the FAA Medical Case Review, the 93-year-old male pilot's family found a paper third class/student pilot medical certificate issued February 3, 1970. This certificate had expired. The FAA did not locate any medical certification file for the pilot.

1.2 Personal Medical Records

The pilots' personal medical records were reviewed from June 20, 2020, to January 22, 2023, including notes from his primary care physician, cardiologist, and

most recent hospital admission. The pilot had an extensive past medical history including a stroke in 2019 with residual left upper extremity weakness, Parkinson's disease resulting in a tremor of his right hand, coronary artery disease with placement of two coronary artery stents in 2009, a recent electrocardiogram with arrhythmias, high blood pressure, high cholesterol, degenerative arthritis of the spine, chronic kidney disease, and recurrent urinary tract infections resulting in hospital admissions. His most recent admission to the hospital for a urinary tract infection was January 19, 2023, at which time he reported daily falls from standing.¹ During that admission, the pilot was diagnosed with moderate senile dementia.² His medication list at that time included carbidopa/levodopa, a prescription medication commonly used to treat Parkinson's disease; atorvastatin, a prescription medication commonly used to control cholesterol and reduce cardiovascular risk; gabapentin, a prescription medication commonly used to treat nerve pain; aspirin, an over-the-counter medication commonly used to treat pain and fever and to reduce cardiovascular risk; finasteride, a prescription medication commonly used to treat an enlarged prostate; and levothyroxine, a prescription medication commonly used to treat low thyroid hormone.

1.3 Autopsy

Central Texas Autopsy performed the pilot's autopsy. According to the pilot's autopsy report, his cause of death was blunt force head and chest trauma, and his manner of death was accident. The heart was described as enlarged with severe calcific coronary artery disease including 50-90% stenosis of the right coronary artery, 40% stenosis of the left main coronary artery, 50 -80% stenosis of the left anterior descending coronary artery and 50-100% stenosis of the circumflex coronary artery. Scar tissue from an old heart attack was noted. The heart was also found to have moderate to severe left ventricular hypertrophy, and severe biventricular dilatation. The aorta was noted to have severe calcific atherosclerotic disease. The kidneys were noted to have changes from severe atherosclerosis. The remainder of the autopsy including examination of the brain, heart, and lungs did not identify other significant natural disease.

¹ Recurrent falls are responsible for significant morbidity in older adults. Falls indicate an overall poor physical and cognitive status of the individual who falls and increased risk for mortality.

Vaishya R, Vaish A. Falls in Older Adults are Serious. *Indian J Orthop*. 2020;54(1):69-74. Published 2020 Jan 24. doi:10.1007/s43465-019-00037-x

² According to the discharge summary from the physician, the pilot was diagnosed with moderately advanced senile dementia. At discharge, the physician recommended that the pilot not drive, and arrangements be made for an alternative level of care (placement in a care facility) secondary to his dementia. The pilot was taken to his home by family.

McCloskey R, Jarrett P, Stewart C, Nicholson P. Alternate level of care patients in hospitals: what does dementia have to do with this? *Can Geriatr J*. 2014;17(3):88-94. Published 2014 Sep 5. doi:10.5770/cgj.17.106.

1.4 Toxicology

1.4.1 Autopsy Toxicology

At the request of Central Texas Autopsy, NMS Labs performed toxicological testing of femoral blood of the pilot. No tested-for substances were detected.³ Caffeine was presumptively positive.⁴

1.4.2 FAA Toxicology

The FAA Forensic Sciences Laboratory performed toxicological testing of heart blood, vitreous fluid, and urine from the pilot.⁵ Ethanol was detected in blood at 0.06 gm/dL. Ethanol was not detected in vitreous fluid or urine. N-butanol was detected in heart blood and was not detected in vitreous fluid or urine. N-propanol was detected in heart blood and was not detected in vitreous fluid or urine. Gabapentin was detected in heart blood at 1986 ng/mL and in urine at 102,094 ng/mL. Cyclobenzaprine was detected in heart blood, and testing for cyclobenzaprine was inconclusive in urine. Norcyclobenzaprine was detected in heart blood at 3 ng/dL and in urine at 17 ng/mL. Acetaminophen was detected in urine and was not detected in heart blood.

1.4.3 Descriptions of Detected Substances

Ethanol is a type of alcohol. It is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance.⁶ FAA regulation imposes strict limits on flying after consuming ethanol, including prohibiting pilots from flying with a blood ethanol level of 0.04 g/dL or greater.⁷ Alcohol consumption is not the only possible source of ethanol in

³ NMS Labs screened for cannabinoids, barbiturates, gabapentin, and salicylates using an enzyme-linked immunosorbent assay (ELISA) and amphetamines, anticonvulsants, antidepressants, antihistamines, antipsychotic agents, benzodiazepines, central nervous system stimulants, cocaine and metabolites, hallucinogens, hypno-sedatives, hypoglycemics, muscle relaxants, non-steroidal anti-inflammatory agents, opiates and opioids by mass spectrometry techniques.

⁴ A presumptive positive result indicates a substance is present on a screening test without a second test to confirm presence or quantity of the detected substance.

⁵ The FAA Forensic Sciences laboratory has the capability to test for around a thousand substances including toxins, prescription and over-the-counter medications, and illicit drugs.

⁶ Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

⁷ 14 Code of Federal Regulations §91.17.

postmortem specimens. Ethanol can sometimes be produced by microbes in a person's body after death. Postmortem ethanol production is made more likely by extensive traumatic injury. Postmortem ethanol production can cause an affected toxicological specimen to test positive for ethanol while another specimen from the same person tests negative⁸

N-propanol and n-butanol are other alcohols that can be produced by microbes in a person's body after death. Their presence in a postmortem specimen is potentially indicative of postmortem microbial activity in the specimen but does not reliably indicate that postmortem ethanol production occurred.⁹

Gabapentin is a medication that is approved by the U.S Food and Drug Administration for seizure disorders and nerve pain caused by herpes infections. It generally carries a warning that use may cause somnolence, dizziness, and general central nervous system (CNS) depression. Precautions are advised for driving a vehicle or operating heavy machinery until the user can assess the impact of dosing on alertness and motor activities.¹⁰ Gabapentin is commonly prescribed for off-label uses such as insomnia, anxiety, depression, migraine, nerve pain, and fibromyalgia. Caution is advised when using gabapentin in older adults as these individuals have increased risk for somnolence, dizziness and falls with gabapentin use. Cautious dosing is also advised in chronic kidney disease to minimize CNS depression.^{11,12} The FAA considers gabapentin a "do not issue/do not fly" medication.¹³

Cyclobenzaprine is a prescription medication commonly used to treat muscle spasms. It generally carries a warning that use in combination with other CNS depressants may impair mental and physical abilities required for the performance of

⁸ Kugelberg FC, Jones AW. Interpreting results of ethanol analysis in postmortem specimens: a review of the literature. *Forensic Sci Int.* 2007;165(1):10-29. doi: 10.1016/j.forsciint.2006.05.004.

⁹ Boumba VA, Exadactylou P, Velivasi G, Ziavrou KS, Fragkouli K, Kovatsi L. The frequency of ethanol, higher alcohols, and other low molecular weight volatiles in postmortem blood samples from unnatural deaths. *Forensic Sci Int.* 2022; 341:111503. doi: 10.1016/j.forsciint.2022.111503.

¹⁰ National Institutes of Health National Library of Medicine. Neurontin-gabapentin capsule. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=ee9ad9ed-6d9f-4ee1-9d7f-cfad438df388>. Updated July 12, 2022. Accessed April 24, 2024.

¹¹ Ali A, Arif AW, Bhan C, et al. Managing Chronic Pain in the Elderly: An Overview of the Recent Therapeutic Advancements. *Cureus.* 2018;10(9): e3293. Published 2018 Sep 13. doi:10.7759/cureus.3293.

¹² Fleet JL, Dixon SN, Kuwornu PJ, et al. Gabapentin dose and the 30-day risk of altered mental status in older adults: A retrospective population-based study. *PLoS One.* 2018;13(3): e0193134. Published 2018 Mar 14. doi: 10.1371/journal.pone.0193134.

¹³ Federal Aviation Administration. "Do not issue/Do not fly" Medications. https://www.faa.gov/ame_guide/media/DNI_DNF_tables.pdf. Updated June 28, 2023. Accessed March 3, 2025.

hazardous tasks such as operating a motor vehicle or operating machinery. The drug generally carries a warning that older adults may be more at risk for CNS events such as hallucinations, confusion, cardiac events, and falls. Caution is advised in using cyclobenzaprine for older adults unless strongly indicated.¹⁴ The FAA considers cyclobenzaprine a “do not fly” medication.¹³ Norcyclobenzaprine is a metabolite of cyclobenzaprine.

Caffeine is a central nervous system stimulant that is commonly ingested, including in coffee, tea, soft drinks, and chocolate, and is also an ingredient in certain anti-drowsiness medications and headache medications.¹⁵ Acetaminophen is an over-the-counter medication commonly used to relieve pain, and fever.¹⁶ Caffeine and acetaminophen are not generally considered impairing.

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¹⁴ National Library of Medicine. National Institutes of Health. Cyclobenzaprine HCL tablet. https://dailymed.nlm.nih.gov/dailymed/lookup.cfm?setid=e9063c42-e71a-4cce-9cd9-9ed6a192c6bb#i4i_warnings_id_3b78d8f2-f6e0-4cfd-bae0-8243820b2d75. Updated April 23, 2010. Accessed March 3, 2025.

¹⁵ ¹⁵ National Institutes of Health National Library of Medicine. Caffeine. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=6d9b3926-7198-5e00-e053-2a91aa0a9580>. Updated September 23, 2020. Accessed January 11, 2024.

¹⁶ National Library of Medicine. National Institutes of Health. Acetaminophen tablet. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=c3b408ff-f47b-4fee-ade5-5db6e25f4ee0>. Updated June 30, 2010. Accessed March 3, 2025.

commonly used to treat an enlarged prostate; and levothyroxine, a prescription medication commonly used to treat low thyroid hormone.

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Submitted by:

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