

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



Medical Factual Memorandum for Record

October 15, 2024

A. CASE

NTSB ID: ERA23FA113
Location: North Castle, New York
Date: January 19, 2023

B. MEDICAL SPECIALIST

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

C. DETAILS

1.0 Description of Review

For purposes of evaluating the pilot for potentially impairing medical conditions and substances, the above Medical Specialist reviewed the following sources of medical information, along with selected relevant regulation, medical literature, and investigator reports.

- Federal Aviation Administration (FAA) final medical case review
- Postmortem examination report- pilot
- Toxicology report - pilot

2.0 Summary of Medical Facts

According to the FAA medical case review, the 40-year-old male pilot's last aviation medical examination was July 3, 2018. At that time, he reported a medical history including seasonal allergies and a kidney stone.¹ He reported using medications including acetaminophen (an over-the-counter medication commonly used to treat minor aches, pains as well as fever) and naproxen (an over-the-counter non-steroidal anti-inflammatory medication commonly used to treat pain and inflammation). He was issued a third-class medical certificate limited by a requirement to wear corrective lenses.

The Office of the Medical Examiner, County of Westchester, performed a postmortem external examination of the pilot. At the discretion of Office of the Medical Examiner, an internal autopsy was not performed. According to the pilot's autopsy report, his cause of death was multiple blunt force trauma, and his manner of death was accident.

The Westchester County Department of Labs and Research, Division of Forensic Toxicology, performed toxicological testing of postmortem urine and subclavian blood from the pilot. 7-aminoclonazepam was detected in blood at 24 ng/mL and in urine at less than 125 ng/mL. Clonazepam was not detected. Sertraline, acetaminophen, salicylic acid, and naproxen were presumptively detected in blood.²

The FAA Forensic Sciences Laboratory performed toxicology testing of postmortem specimens from the pilot.³ 7-aminoclonazepam was detected in subclavian blood at 25 ng/mL and urine at 94 ng/mL. Sertraline was detected in blood at 78 ng/mL and was also detected in urine. Desmethylertraline was detected in blood at 214 ng/mL and was also detected in urine. Famotidine was detected in both blood and urine.

7-aminoclonazepam is a metabolite of clonazepam, which was not detected in this case. Clonazepam is a prescription benzodiazepine commonly used to treat seizures, panic attacks and anxiety. Clonazepam generally carries warnings regarding

¹ According to the FAA Medical Case Review file, the pilot had a letter of eligibility for the kidney stone from June 18, 2009.

² A presumptive positive indicates a substance is present on a screening test. In order to confirm presence or quantity of the detected substance, a confirmatory test must be performed.
<https://www.criminaljustice.ny.gov/forensic/standardization/toxicology.html>. Updated February 2024. Accessed May 29, 2024.

³ 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.

risks of impaired judgement, thinking and motor skills with use. It also usually carries warnings regarding abuse, misuse, addiction, and withdrawal. Operating a motor vehicle or hazardous machinery while using clonazepam is not advised until the effects of the medication can be determined by the user.⁴ Clonazepam is a high-potency benzodiazepine with a long half-life (19-42 hours).⁵ It is mainly converted into 7-aminoclonazepam after use and 7-aminoclonazepam can be detected in blood for 3-5 days and urine up to one month after a single dose.^{6,7} Clonazepam is potentially degraded by postmortem bacterial activity to 7-aminoclonazepam. The postmortem degradation by bacteria makes interpretation of postmortem clonazepam and 7-aminoclonazepam levels difficult.⁸ The FAA considers clonazepam a “do not issue/do not fly” medication even if used for non-seizure indications.⁹

Sertraline is a prescription selective serotonin-reuptake inhibitor (SSRI) medication commonly used to treat depression, anxiety, panic disorders, and post-traumatic stress disorder.¹⁰ A pilot on sertraline (not in combination with other psychiatric drugs) may be considered for FAA medical certification via an Authorization for Special Issuance, depending on a detailed evaluation of the individual pilot’s condition, including assessment of the pilot’s response to treatment.¹¹ Desmethylsertraline is a metabolite of sertraline.

⁴ National Institutes of Health National Library of Science. Clonazepam tablet. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b1582eb7-af35-45d5-a52e-0e380d08527d>. Updated February 2, 2023. Accessed May 29, 2024.

⁵ Berlin A, Dahlström H. Pharmacokinetics of the anticonvulsant drug clonazepam evaluated from single oral and intravenous doses and by repeated oral administration. *European Journal of Clinical Pharmacology*. 1975;9(2-3):155-159. doi:<https://doi.org/10.1007/bf00614012>.

⁶ Steentoft A, Linnet K. Blood concentrations of clonazepam and 7-aminoclonazepam in forensic cases in Denmark for the period 2002-2007. *Forensic Sci Int*. 2009;184(1-3):74-79. doi:10.1016/j.forsciint.2008.12.004.

⁷ Negrusz A, Bowen AM, Moore CM, Dowd SM, Strong MJ, Janicak PG. Elimination of 7-aminoclonazepam in urine after a single dose of clonazepam. *Anal Bioanal Chem*. 2003;376(8):1198-1204. doi:10.1007/s00216-003-2050-7.

⁸ Peters FT, Steuer AE. Antemortem and postmortem influences on drug concentrations and metabolite patterns in postmortem specimens. *Wiley Interdisciplinary Reviews: Forensic Science*. Published online December 16, 2018:e1297. doi:<https://doi.org/10.1002/wfs2.1297>.

⁹ Federal Aviation Administration. Guide for aviation medical examiners: pharmaceuticals (therapeutic medications) do not issue - do not fly. Federal Aviation Administration website. https://www.faa.gov/ame_guide/pharm/dni_dnf. Updated July 10, 2023. Accessed October 10, 2024.

¹⁰ National Institutes of Health National Library of Medicine. Sertraline hydrochloride. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=9bc362d4-489c-4e7f-915a-3076ff8d132a>. Updated February 9, 2024. Accessed May 29, 2024.

¹¹ Federal Aviation Administration. Guide for Medical Examiners: Decisions considerations - aerospace medical dispositions. Item 47. Psychiatric Conditions- use of antidepressants. https://www.faa.gov/ame_guide/app_process/exam_tech/item47/amd/antidepressants. Updated April 24, 2024. Accessed August 2, 2024.

Famotidine is an over-the-counter stomach acid suppressing medication commonly used to treat heartburn, gastroesophageal reflux, and peptic ulcer disease.¹² Acetaminophen is an over-the-counter medication used to treat minor aches, pains as well as reduce fever.¹³ Salicylic acid is the primary active metabolite of aspirin, a widely available over-the-counter medication that can be used to control pain and fever and to reduce cardiovascular risk. Salicylic acid can also be found in over-the-counter medication used topically to treat skin conditions. It is often found in acne treatments.^{14,15} Naproxen is an over-the-counter non-steroidal anti-inflammatory medication used to treat minor aches and pains from arthritis. Famotidine, acetaminophen, salicylic acid, and naproxen are not generally considered impairing.

Submitted by:

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Medical Officer

¹² National Institutes of Health National Library of Medicine. Famotidine tablet. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f149ecc1-d66c-42f9-a3f4-2ab6a522942b>. Updated October 4, 2021. Accessed May 29, 2024.

¹³ National Institutes of Health National Library of Medicine. Acetaminophen tablet. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=c3b408ff-f47b-4fee-ade5-5db6e25f4ee0>. Updated June 30, 2010. Accessed May 29, 2024.

¹⁴ National Institutes of Health National Library of Medicine. Salicylic acid 2%. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f6dfaa8f-1671-1460-e053-6394a90aa67c>. Updated March 13, 2023. Accessed October 8, 2024.

¹⁵ National Institutes of Health National Library of Medicine. Aspirin. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b0e260a2-4e86-479a-b17b-60324694f669#:~:text=Uses.%20temporarily%20relieves:%20%E2%80%A2%20pain%20and%20fever%20of%20colds%20->. Updated February 21, 2024. Accessed October 8, 2024.

¹⁵ National Institutes of Health National Library of Medicine. Aspirin. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b0e260a2-4e86-479a-b17b-60324694f669#:~:text=Uses.%20temporarily%20relieves:%20%E2%80%A2%20pain%20and%20fever%20of%20colds%20->. Updated February 21, 2024. Accessed October 8, 2024.