

From: [Watters Michelle](#)
To: [Baker Daniel](#)
Subject: FINAL medical factual and analytical (OUO) for CEN19FA191, Elyria, OH
Date: Thursday, November 5, 2020 8:41:40 AM

Dan,

Below please find the final medical factual and analytical (OUO) report for CEN19FA191, Elyria, OH.

Please place this email on the OUO side of the docket as it contains analysis.

Thank-you.

Michelle

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On June 30, 2019 at 1445 EDT, a Piper J-3C-65 airplane, N98527, impacted terrain shortly after departing Elyria Municipal Airport (1G1), Elyria, Ohio. The sport pilot was fatally injured. The airplane was substantially damaged. The airplane was owned and operated by a private individual and the flight was conducted as a 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident, and no flight plan was filed.

You asked us to review this case (CEN19FA191; Elyria, OH) because of the pilot's positive toxicology report "for multiple non-qualifying drugs."

I reviewed the Federal Aviation Administration (FAA) medical case review and the pilot's personal medical records, autopsy, and FAA Forensic Sciences Laboratory toxicology ^[1] report. I also reviewed other relevant medical information.

Reports provided

According to the FAA medical case review, the 63-year-old male pilot did not have a medical certificate. The pilot was medically eligible to fly as a light sport pilot as long as he had a valid driver's license and was not aware of having any medical condition that would make him unable to fly in a safe manner.

Pre-accident medical records were obtained for the three years prior to the crash. At his primary care office visit in February 2019, the pilot complained of lower back pain and sciatica; he was not prescribed pain medications. The pilot's most recent primary care visit and annual ophthalmology visit were in May 2019. The pilot was reported as obese, with a body mass index of 34 (height 6 feet, weight 250 pounds). The pilot was being treated for high blood pressure with lisinopril and hydrochlorothiazide, high cholesterol with atorvastatin, and type 2 diabetes with metformin and long-

acting insulin. ^[2] ^[3] ^[4] ^[5] These medications are considered non-impairing and metformin taken with insulin is considered an acceptable FAA diabetes medication combination after an appropriate

observation time. ^[6] The pilot had age-related farsightedness, but no eye complications from diabetes. His most recent hemoglobin A1C on 2/28/19 was 6.8% and he was reported to have no other diabetic

complications. ^[7] He had no planned procedures and his next office visit was to be a routine follow-up.

Post-accident medical records were obtained from the local emergency medical services. With the exception of applying a “4 lead” electrocardiogram (ECG), there was no medical treatment administered and the pilot was declared dead at the scene.

According to the Office of the Lorain County Coroner, Oberlin, Ohio autopsy report, the cause of the pilot’s death was multiple blunt force injuries and manner of death was accident. The coroner’s findings included an enlarged heart (510 grams), mild coronary artery atherosclerosis, sclerotic arteries in the kidneys, and an enlarged fatty liver. No other significant natural disease was identified.

Toxicology testing performed for the coroner’s office was positive for codeine in the pilot’s iliac blood at 8.5 nanograms per milliliter (ng/mL); his urine was also positive for codeine, morphine, and hydrocodone. FAA Forensic Sciences Laboratory detected codeine in the pilot’s subclavian blood at 10 ng/mL and his urine at 1,035 ng/mL; morphine (204 ng/mL) and hydrocodone were detected in urine. Laudanosine, which is a metabolite of drugs used for general anesthesia, was detected in the pilot’s

urine and the irregular heartbeat medication flecainide was detected in his heart blood and urine.^[8]^[9] The FAA laboratory also detected the non-sedating high blood pressure medication hydrochlorothiazide in the pilots’ heart blood and urine.

Codeine is prescribed to relieve mild to moderate pain or to suppress coughing. It is often prescribed in combination with acetaminophen (commonly marketed as Tylenol with Codeine). Codeine is a narcotic medication and use carries a high risk of addiction, abuse, and misuse. It is an impairing medication and carries the warning that patients should not drive or operate dangerous machinery until they know how they will react to the medication. The plasma half-life of codeine is about three hours and its therapeutic range is 100 to 230 ng/mL. Codeine is metabolized mainly in the liver to morphine and norcodeine. Hydrocodone is a minor metabolite of codeine; as much as 11% of the codeine concentration may be excreted in the urine as hydrocodone. About 10% of codeine is excreted unchanged in the urine.^[10]^[11]^[12]

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[1] The FAA Forensic Sciences Laboratory tests for more than 1,300 substances including toxins, common prescription and over-the-counter medications as well as illicit drugs. See: https://www.faa.gov/data_research/research/med_humanfaqs/aeromedical/forensictoxicology/.

² National Institutes of Health (NIH). U.S. National Library of Medicine (NLM). DailyMed. Zestoretic—lisinopril and hydrochlorothiazide tablet. Updated 11/14/19. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=0d3a966f-f937-05a8-a90f-5aa52ebbd613>

- ³ NIH NLM. DailyMed. Atorvastatin. Updated 10/6/20. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2e94161c-3360-4fb0-bb3a-048fdc1d137a>
- ⁴ NIH NLM. DailyMed. Metformin. Updated 10/15/20. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b857eccf-b9ff-45ba-8241-f47f5caada2a>
- ⁵ NIH NLM. DailyMed. Levimir—insulin detemir injection, solution. Updated 3/24/20. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d38d65c1-25bf-401d-9c7e-a2c3222da8af>
- ⁶ FAA. Updated 7/29/20. Acceptable combinations of diabetes medications. https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/media/diabetesmeds_acceptablecomb.pdf
- ⁷ Hemoglobin A1C is a measure of the percentage of hemoglobin molecules that have a glucose molecule attached to them. The test measures the average blood glucose over the past three months. Above 6.5% indicates diabetes and the goal for many diabetics is to be below 7.0%. [NIH. NLM. MedlinePlus. A1C. <https://medlineplus.gov/a1c.html> Page last updated 11/26/19.]
- ⁸ Fodale, V and LB Santamaria. 2000. Laudanosine, an atracurium and cisatracurium metabolite. *European Journal of Anaesthesiology* 19(7):466-473.
- ⁹ NIH. NLM. DailyMed. Flecainide. Updated 5/17/19. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d462d58e-fc3c-4c92-a210-e135eb1f4b77>
- ¹⁰ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Codeine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=36>
- [1]¹ NIH. NLM. DailyMed. Codeine. Updated 10/9/19. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=010905f9-3bcb-4b50-9fe8-a3ad0010f14c>
- [1]² Oyler, JM, EJ Cone, RE Joseph Jr., MA Huestis. 2000. Identification of hydrocodone in human urine following controlled codeine administration. *Journal of Analytical Toxicology* 24:530-535.

[REDACTED]

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- [1] The FAA Forensic Sciences Laboratory tests for more than 1,300 substances including toxins, common prescription and over-the-counter medications as well as illicit drugs. See: https://www.faa.gov/data_research/research/med_humanfacs/aeromedical/forensictoxicology/.
- [2] National Institutes of Health (NIH). U.S. National Library of Medicine (NLM). DailyMed. Zestoretic—lisinopril and hydrochlorothiazide tablet. Updated 11/14/19. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=0d3a966f-f937-05a8-a90f-5aa52ebbd613>
- [3] NIH NLM. DailyMed. Atorvastatin. Updated 10/6/20. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2e94161c-3360-4fb0-bb3a-048fdc1d137a>
- [4] NIH NLM. DailyMed. Metformin. Updated 10/15/20. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b857eccf-b9ff-45ba-8241-f47f5caada2a>
- [5] NIH NLM. DailyMed. Levimir—insulin detemir injection, solution. Updated 3/24/20. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d38d65c1-25bf-401d-9c7e-a2c3222da8af>
- [6] FAA. Updated 7/29/20. Acceptable combinations of diabetes medications. https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/media/diabetesmeds_acceptablecomb.pdf
- [7] Hemoglobin A1C is a measure of the percentage of hemoglobin molecules that have a glucose molecule attached to them. The test measures the average blood glucose over the past three months. Above 6.5% indicates diabetes and the goal for many diabetics is to be below 7.0%. [NIH. NLM. MedlinePlus. A1C. <https://medlineplus.gov/a1c.html> Page last updated 11/26/19.]
- [8] Fodale, V and LB Santamaria. 2000. Laudanosine, an atracurium and cisatracurium metabolite. *European Journal of Anaesthesiology* 19(7):466-473.
- [9] NIH. NLM. DailyMed. Flecainide. Updated 5/17/19. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d462d58e-fc3c-4c92-a210-e135eb1f4b77>

[10] FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Codeine. <https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=36>

[11] NIH. NLM. DailyMed. Codeine. Updated 10/9/19. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=010905f9-3bcb-4b50-9fe8-a3ad0010f14c>

[12] Oyler, JM, EJ Cone, RE Joseph Jr., MA Huestis. 2000. Identification of hydrocodone in human urine following controlled codeine administration. *Journal of Analytical Toxicology* 24:530-535.

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