



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

September 13, 2018

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Chief Medical Officer

A. ACCIDENT: WPR18FA045; Geneva, FL

On December 8, 2017, about 1115 eastern standard time, a Beech C90, N19LW, was destroyed when it impacted the waters of Lake Harney, near Geneva, Florida. The airplane was registered to Planemarketing LLC, Vero Beach, Florida, and operated by L3 Airline Academy as CONN900 as a 14 Code of Federal Regulations Part 91 instructional flight. The Flight Instructor and two commercial pilots receiving instruction were fatally injured. Instrument and visual meteorological conditions prevailed in the area, and an instrument flight rules flight plan was filed for the flight, which originated from Sanford, Florida, about 0753.

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 reports, toxicology findings, and the investigator's reports were reviewed.

Certified Flight Instructor (CFI)

FAA Medical Case Review

According to the FAA medical case review, the 56 year old male CFI had reported 4,500 total hours of flight experience as of his last aviation medical exam, dated 8/19/2017. At that time, he was 74 inches tall and

weighed 220 pounds. The pilot had previously reported some orthopedic injuries and surgical procedures but had not reported any chronic medical conditions. At the time of his last exam, he reported using low dose aspirin as prophylaxis against heart disease and occasionally taking ibuprofen, an over the counter analgesic commonly marketed with the names Advil and Motrin. These drugs are not considered impairing. The CFI was issued a third class medical certificate limited by a requirement to wear corrective lenses.

Autopsy

According to the autopsy performed by Office of the Medical Examiner, Daytona Beach, the cause of death was multiple blunt force injuries and the manner of death was accident. The brain was not examined, due to the extent of injury. The heart weighed 330 grams with significant focal atherosclerotic narrowing in the proximal left anterior descending coronary artery, up to 75% occlusion. The remainder of the cardiac examination was unremarkable. Average cardiac weight for a 220 pound man is 391 grams with a range of 296 to 516 grams.¹

Toxicology

Toxicology testing performed by NMS Labs at the request of the medical examiner identified oxycodone (370 ng/gm; 0.370 ug/gm) and its active metabolite oxymorphone (340 ng/gm; 0.340 ug/gm) in liver tissue.

Toxicology testing performed by the FAA's Bioaeronautical Sciences Research Laboratory identified ethanol at 0.073 gm/dg and N-butanol in muscle tissue as well as 0.028 gm/dg of ethanol in lung.² In addition, oxycodone was found at 0.382 ug/gm and its active metabolite oxymorphone at 0.253 ug/gm in liver tissue; in muscle there was 0.102 ug/gm of oxycodone, but testing was inconclusive for oxymorphone.

[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.³ Federal Aviation Regulations, Section 91.17 (a) prohibits any person from acting or attempting to act as a crewmember of a civil aircraft while having 0.040 gm/dl or more ethanol in the blood.⁴ Because ingested alcohol is distributed throughout the body, levels from

¹ Kitzman DW, Scholz DG, Hagen PT, Ilstrup DM, Edwards WD. Age-related changes in normal human hearts during the first 10 decades of life. Part II (Maturity): A quantitative anatomic study of 765 specimens from subjects 20 to 99 years old. Mayo Clinic Proc., 1988. 63(2): 137-46.

² These units are given for solid tissue (gm/dg) but are equivalent to gm/dl for liquids.

³ Cook, C.C., Alcohol and aviation. Addiction (Abingdon, England), 1997. 92(5): 539-555.

⁴ US Government Printing Office .eCFR- Code of Federal Regulations. 91.17. <http://www.ecfr.gov/cgi-bin/text-idx?rgn=div8&node=14:2.0.1.3.10.1.4.9>. Accessed 6/16/2018.

different post mortem tissues are usually similar. Ethanol may also be produced in body tissues by microbial activity after death.⁵

N-butanol is another alcohol which is produced in post mortem tissues.

Oxycodone is an opioid pain medication available by prescription, usually in combination with acetaminophen (Tylenol); common marketing names are Percocet and Oxycontin. Oxycodone is a Schedule II controlled substance, indicating it has significant potential for abuse and addiction.⁶ Oxycodone carries this warning, “Patients should be advised that oxycodone hydrochloride tablets may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery).”⁷ Oxymorphone is its primary active metabolite but is also available as a prescription drug in its own right; a common marketing name is Opana. Its warning is, “Warn patients not to drive or operate dangerous machinery unless they are tolerant to the effects of oxymorphone hydrochloride tablets and know how they will react to the medication.”⁸]

Right Seated Pilot Receiving Instruction

FAA Medical Case Review

According to the FAA medical case review, the 23 year old male pilot receiving instruction who was sitting in the right front seat had reported 0 total hours of flight experience as of his last aviation medical exam, dated 12/08/2016. At that time, he was 68 inches tall and weighed 133 pounds. He reported no chronic medical conditions and no use of medications to the FAA. He was issued a second class medical certificate limited by a requirement that he wear corrective lenses.

Autopsy

According to the autopsy performed by Office of the Medical Examiner, Daytona Beach, the cause of death was multiple blunt force injuries and

⁵ Federal Aviation Administration. Forensic Toxicology Drug Information. Ethanol.

<http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=60> Accessed 12/02/2018.

⁶ 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.

⁷ National Institutes of Health. US National Library of Medicine. DailyMed. Oxycodone tablets.

<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=9cfea43d-ed03-4ab9-aa16-9d738ea00378>
Accessed 9/10/2018.

⁸ National Institutes of Health. US National Library of Medicine. DailyMed. Oxymorphone tablets.

<https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=22c7652a-aa16-4fa8-89d9-517e69059068>
Accessed 9/10/2018.

the manner of death was accident. The brain was not examined due to the extent of injury. No significant natural disease was identified.

Toxicology

Toxicology testing performed by NMS Labs at the request of the medical examiner did not identify any tested-for substances.

Toxicology testing performed by the FAA's Bioaeronautical Sciences Research Laboratory identified ethanol at 0.022 gm/dg of ethanol in lung but no ethanol in muscle tissue. No other tested-for substances were identified.

Rear Seated Pilot Receiving Instruction

FAA Medical Case Review

According to the FAA medical case review, the 22 year old male pilot receiving instruction who was sitting in a rear seat had reported 0 total hours of flight experience as of his last aviation medical exam, dated 10/16/2016. At that time, he was 71 inches tall and weighed 141 pounds. He reported no chronic medical conditions and no use of medications to the FAA. He was issued a second class medical certificate without limitations.

Autopsy

According to the autopsy performed by Office of the Medical Examiner, Daytona Beach, the cause of death was multiple blunt force injuries and the manner of death was accident. The brain examination was limited by the extent of injury and decomposition. No significant natural disease was identified.

Toxicology

Toxicology testing performed by NMS Labs at the request of the medical examiner did not identify any tested-for substances.

Toxicology testing performed by the FAA's Bioaeronautical Sciences Research Laboratory identified ethanol at 0.022 gm/dg of ethanol in brain tissue but no ethanol in muscle tissue. No other tested-for substances were identified.

D. SUMMARY OF MEDICAL FINDINGS

The 56 year old male certified flight instructor (CFI) had The pilot had reported some orthopedic injuries and surgical procedures but had not reported any chronic medical conditions to the FAA. At the time of his last exam, he reported using low dose aspirin as prophylaxis against heart disease and occasionally taking ibuprofen, an over the counter analgesic commonly marketed with the names Advil and Motrin. These drugs are not considered impairing.

According to the autopsy performed by Office of the Medical Examiner, Daytona Beach, the cause of death was multiple blunt force injuries and the manner of death was accident. The brain was not examined, due to the extent of injury. Significant coronary atherosclerosis (75% stenosis of the left anterior descending coronary artery) was identified but there was no evidence of previous ischemia.

Toxicology testing in two labs identified significant amounts of oxycodone (0.370 ug/gm and 0.382 ug/gm) as well as its active metabolite oxymorphone (0.340 ug/gm and 0.253 ug/gm) in the CFI's liver tissue; oxycodone was also found in muscle (0.102 ug/gm). In addition, one lab found ethanol at 0.073 gm/hg and N-butanol in muscle and 0.028 gm/hg of ethanol in lung.

Neither of the pilots receiving instruction (front seat male age 23 and rear seat male age 22) had reported any medical conditions or use of medications to the FAA. According to the autopsies performed by Office of the Medical Examiner, Daytona Beach, the cause of the deaths was multiple blunt force injuries and the manner of the deaths was accident. No natural disease was identified for either of these pilots. Both had positive toxicology tests for ethanol in one body tissue but tests of muscle tissue for each pilot receiving instruction were negative for ethanol.