



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

February 15, 2019

Mary Pat McKay, MD, MPH
Chief Medical Officer

A. ACCIDENT: ERA18FA092; Georgetown, FL

On February 27, 2018, about 1930 eastern standard time, a Quest Kodiak 100, N969TB, was substantially damaged after it impacted a river near Georgetown, Florida. The private pilot and pilot-rated passenger were fatally injured. The airplane was registered to and operated by an individual as a 14 Code of Federal Regulations Part 91 personal flight. Night visual meteorological conditions prevailed, and there was no flight plan filed for the flight, which was destined for Mount Royal Airport (3FL0), Welaka, Florida.

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 for both the pilot and pilot rated passenger.

Pilot

FAA Medical Case Review

According to the FAA medical case review, the 68 year old male pilot had reported 3400 total hours of flight experience as of his last aviation medical exam, dated 11/26/2017. At that time, he was 76 inches tall and weighed 309 pounds. Over the years, the pilot had reported hypertension and gout to the FAA. In 2005, he reported having had triple vessel

coronary artery bypass surgery. By 2007, he had received a special issuance medical certificate from the FAA. At his last exam he reported using amlodipine, valsartan, metoprolol, and hydrochlorothiazide to control his blood pressure; allopurinol to control his gout; and aspirin to prevent a heart attack.^{1,2,3,4,5,6} None of these medications are considered impairing. No significant abnormalities were noted on the physical exam and the FAA's review of the information from the pilot's cardiologist from 1/27/2017 demonstrated a recent nuclear stress test that did not identify any reversible ischemia. The pilot was issued a special issuance third class medical certificate limited by a requirement to possess glasses for near vision and marked, "Not valid for any class after 11/30/2018."

Autopsy

According to the autopsy performed by the Office of the Medical Examiner, Florida, District 23, the cause of death was multiple blunt force injuries and the manner of death was accident. The brain was not available for examination due to the extent of injury. The heart was fragmented and enlarged. It weighed 720 gm. Average heart weight for a 309 pound man is 463 grams with a range of 351 to 611 grams.⁷ There was wall thickening; the left ventricle was 1.8 centimeters thick, the septum was 2.0 centimeters, and right ventricle was 0.4 centimeters thick. Averages thicknesses are 1.3 cm for the left ventricle and septum and 0.3 cm for the right ventricle.⁷

The extent of injury limited the cardiac evaluation; while both the native left anterior descending and circumflex arteries had moderate to severe calcific atherosclerosis, the right coronary artery was not identified. Similarly, two cardiac bypass grafts were identified and appeared patent

¹ National Institutes of Health. US National Library of Medicine. DailyMed. Amlodipine. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b52e2905-f906-4c46-bb24-2c7754c5d75b> Accessed 12/11/2018.

² National Institutes of Health. US National Library of Medicine. DailyMed. Valsartan. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=9402b022-5809-4251-dfef-54f6ef5723fe> Accessed 12/11/2018.

³ National Institutes of Health. US National Library of Medicine. DailyMed. Metoprolol. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2d948600-35d8-4490-983b-918bdce488c8> Accessed 12/11/2018.

⁴ National Institutes of Health. US National Library of Medicine. DailyMed. Hydrochlorothiazide. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=841b7962-bf5d-4c45-b594-80b17ba5187d> Accessed 12/11/2018.

⁵ National Institutes of Health. US National Library of Medicine. DailyMed. Allopurinol. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=682dd8b8-fc6e-47c5-95b7-82d7ad96b750> Accessed 12/11/2018.

⁶ National Institutes of Health. US National Library of Medicine. DailyMed. Aspirin. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=9829f56f-723c-473f-89ec-4cb2efb3b8bc> Accessed 12/11/2018.

⁷ 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.

but the third was not seen. There was an area of white (scarred) infarction in the posterior intraventricular septum. Microscopy demonstrated myocyte hypertrophy, multiple focal areas of replacement fibrosis most prominent towards the endocardium, increased perivascular and interstitial fibrosis, and thickening of the small intramural arteries but no acute or chronic inflammation.

Toxicology

No blood was available for examination. Toxicology testing performed by NMS Labs at the request of the medical examiner identified levels of ethanol in various tissues that ranged from 0.073 gm/dl to zero.

Toxicology testing performed by the FAA's Bioaeronautical Sciences Research Laboratory identified 0.025 gm/dl of ethanol in muscle but none in liver tissue. In addition, valsartan was identified in muscle and liver.

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.⁸ 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.⁹ Because ingested alcohol is distributed throughout the body, levels from different post mortem tissues are usually similar. Ethanol may also be produced in body tissues by microbial activity after death; in this case, levels in various samples tend to vary widely.¹⁰

Pilot Rated Passenger

FAA Medical Case Review

According to the FAA medical case review, the 56 year old male pilot rated passenger had reported 23,165 total hours of flight experience as of his last aviation medical exam, dated 10/4/2013. At that time, he was 71 inches tall and weighed 239 pounds. The pilot had reported no chronic medical conditions and no use of medications to the FAA. No significant abnormalities were noted on the physical exam and he was issued a second class medical certificate limited by a requirement he possess glasses for near/intermediate vision.

⁸ Cook, C.C., Alcohol and aviation. *Addiction* (Abingdon, England), 1997. 92(5): 539-555.

⁹ 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 6/16/2016.

¹⁰ Federal Aviation Administration. Forensic Toxicology Drug Information. Ethanol. <http://jag.camii.jccbi.gov/toxicology/DrugDetail.asp?did=60> Accessed 12/02/2016.

Autopsy

According to the autopsy performed by the Office of the Medical Examiner, Florida, District 23, the cause of death was multiple blunt force injuries and the manner of death was accident.

The pilot rated passenger was described by the pathologist as weighing 282 pounds. His heart weighed 490 grams and the wall thickness of the left ventricle was 1.1 centimeters, the septum 1.1 centimeters, and right ventricle 0.4 centimeters. Average heart weight for a man of his size is 443 gm with a range of 335 – 584 gm.⁷ The coronary arteries were dilated with moderate to severe calcific atherosclerosis with 70-80% stenosis of the left anterior descending, as well as up to 60 -70% stenosis of the circumflex and right coronary arteries. The remainder of the cardiac exam was unremarkable.

Toxicology

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

Toxicology testing performed by the FAA's Bioaeronautical Sciences Research Laboratory identified valsartan, rosuvastatin, and amlodipine in cavity blood. All of these and clopidogrel were identified in urine.

See above for references to valsartan and amlodipine. Rosuvastatin is a cholesterol lowering prescription medication commonly marketed as Crestor.¹¹ Clopidogrel is an antiplatelet drug also marketed with the name Plavix.¹² None of these medications are considered impairing.

D. SUMMARY OF MEDICAL FINDINGS

PILOT: The 68 year old male pilot was 76 inches tall and weighed 309 pounds as of his last aviation medical exam, dated 11/26/2017. Over the years, the pilot had reported hypertension and gout to the FAA. In 2005, he reported having had triple vessel coronary artery bypass surgery. By 2007, he had received a special issuance medical certificate from the FAA. At his last exam he reported using amlodipine, valsartan, metoprolol, and hydrochlorothiazide to control his blood pressure; allopurinol to control his gout; and aspirin to prevent a heart attack. None of these medications are considered impairing. No significant abnormalities were noted on the physical exam and the FAA's review of the information from the pilot's cardiologist from 1/27/2017 demonstrated a recent nuclear stress test that did not identify any reversible ischemia. The pilot was issued a special

¹¹ National Institutes of Health. US National Library of Medicine. DailyMed. Rosuvastatin. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=bd26b8b9-baad-d988-79ba-3f908a8eaab6> Accessed 12/11/2018.

¹² National Institutes of Health. US National Library of Medicine. DailyMed. Clopidogrel. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=edae8df1-caf9-ff72-1304-5ae8b355f8e7> Accessed 12/11/2018.

issuance third class medical certificate limited by a requirement to possess glasses for near vision and marked, "Not valid for any class after 11/30/2018."

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No blood was available for examination. Toxicology testing in two labs identified levels of ethanol in various tissues that ranged from 0.073 gm/dl to zero. In addition, valsartan was identified in muscle and liver.

PILOT RATED PASSENGER: The 56 year old male pilot rated passenger was 71 inches tall and weighed 239 pounds at the time of his last medical exam, dated 10/4/2013. The pilot had reported no chronic medical conditions and no use of medications to the FAA. No significant abnormalities were noted on the physical exam and he was issued a second class medical certificate limited by a requirement he possess glasses for near/intermediate vision.

According to the autopsy performed by the Office of the Medical Examiner, Florida, District 23, the cause of death was multiple blunt force injuries and the manner of death was accident.

The pilot rated passenger was described by the pathologist as weighing 282 pounds. His heart weighed 490 grams and the wall thickness of the left ventricle was 1.1 centimeters, the septum 1.1 centimeters, and right ventricle 0.4 centimeters. Average heart weight for a man of his size is 443 gm with a range of 335 – 584 gm. The coronary arteries were dilated with moderate to severe calcific atherosclerosis with 70-80% stenosis of the left anterior descending, as well as up to 60 -70% stenosis of the circumflex and right coronary arteries. The remainder of the cardiac exam was unremarkable.

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