



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

June 5, 2018

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Chief Medical Officer

A. ACCIDENT: CEN17FA315; Las Vegas, NM

On August 9, 2017, about 1025 mountain daylight time, a Piper PA-22-150 airplane, N3664Z, impacted terrain near Las Vegas, New Mexico. The private pilot was fatally injured and the airplane was substantially damaged. The airplane was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, which operated without a flight plan. The cross-country flight departed Dalhart, Texas, and was en route to Santa Fe, New Mexico.

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 any medical conditions, the use of any medications/illicit drugs, and the presence of any toxins.

2. Methods

The FAA medical case review, autopsy reports, toxicology findings, and the investigator's reports were reviewed.

FAA Medical Case Review

According to the FAA medical case review, the 70 year old male pilot had reported 378 total hours of flight experience as of his last aviation medical exam, dated 5/17/2012. At that time, he was 70 inches tall and weighed 217 pounds. He had reported various orthopedic surgeries to the FAA but no use of regular medications. At his last exam, his blood pressure reading was 150/88. No significant physical abnormalities were identified and he

was issued a third class medical certificate limited by a requirement that he wear corrective lenses.

The pilot had registered under BasicMed in May 2017.

Autopsy

According to the autopsy report issued by the State of New Mexico, Office of the Medical Investigator, the cause of death was blunt force injuries.

The autopsy was limited by the severity of injury; brain tissue was not available for examination. Significant atherosclerotic heart disease was identified. The heart was enlarged and weighed 470 gm with mild four chamber dilation. The proximal left anterior descending coronary artery was stenosed 90%, and both the circumflex and right coronary arteries had 50% stenoses. There was fibrosis on the left ventricular free wall; scarring from a previous heart attack. Left concentric ventricular hypertrophy was mentioned but the wall thicknesses were 1 cm for both the left ventricle and septum and 0.3 cm for the right ventricle. Average heart weight for a 216 pound man is 387 grams with a range of 293-511 grams and average wall thicknesses are 1.3 cm for the left ventricle and septum and 0.3 cm for the right ventricle.¹

Microscopy demonstrated a focus of increased fibrosis with cardiac myocyte dropout consistent with scar. The remaining heart had increased interstitial and perivascular fibrosis.

Toxicology

Toxicology testing performed by NMS Labs did not identify any ethanol or tested-for drugs in liver tissue.

Toxicology testing performed by the FAA's Bioaeronautical Sciences Research Laboratory identified ethanol at 0.151 gm/hg in muscle and 0.037 gm/hg in liver tissue.² Another alcohol, commonly produced in tissues after death, N-propanol was detected in muscle. Finally, metoprolol was found in lung and muscle.

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

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 Gm/hg as units reflects the use of solid tissue for the determination. These units compare directly with gm/dl in blood.

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 different post mortem tissues are usually similar. Ethanol may also be produced in body tissues by microbial activity after death.⁵ In these cases, levels among different tissues tend to vary considerably.

Metoprolol is a blood pressure medication that can also help prevent recurrent heart attacks. It is not generally considered impairing and is commonly sold with the names Lopressor and Toprol.⁶

D. SUMMARY OF MEDICAL FINDINGS

The 70 year old male pilot had reported no chronic medical conditions and no use of medications to the FAA. His most recent medical certification had expired for all classes in 2014. He had registered through the BasicMed program 3 months before the accident.

According to the autopsy report issued by the State of New Mexico, Office of the Medical Investigator, the cause of death was blunt force injuries. The autopsy was limited by the severity of injury; brain tissue was not available for examination. Significant atherosclerotic heart disease was identified. The heart was enlarged and weighed 470 gm with mild four chamber dilation. The proximal left anterior descending coronary artery was stenosed 90%, and both the circumflex and right coronary arteries had 50% stenoses. There was fibrosis on the left ventricular free wall; scarring from a previous heart attack. Microscopy demonstrated a focus of increased fibrosis with cardiac myocyte dropout consistent with scar. The remaining heart had increased interstitial and perivascular fibrosis.

Toxicology testing performed at the request of the medical investigator did not identify any ethanol or tested-for drugs in liver tissue. Other testing identified ethanol at 0.151 gm/hg in muscle and 0.037 gm/hg in liver tissue. Another alcohol, commonly produced in tissues after death, N-propanol was detected in muscle. Finally, metoprolol was found in lung and muscle.

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 6/16/2017.

⁵ Federal Aviation Administration. Forensic Toxicology Drug Information. Ethanol. <http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=60> Accessed 12/02/2017.

⁶ National Institutes of Health. US National Library of Medicine. DailyMed. Metoprolol. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=a8374722-d2b5-4eb3-bbcd-6ddc52e763ba> Accessed 6/5/2018.