



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

February 16, 2021

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Chief Medical Officer

A. ACCIDENT: WPR20FA015; American Falls, ID

On October 25, 2019, about 1200 mountain daylight time, a Mooney M-20J airplane, N201BJ, impacted terrain near American Falls, Idaho. The private pilot was fatally injured, and the airplane sustained substantial damage to both wings and fuselage. The airplane was registered to the pilot who was operating it as a Title 14 *Code of Federal Regulations* Part 91 cross-country flight. Visual meteorological conditions prevailed about the time of the accident, and no flight plan was filed. The flight departed Dinsmore Airport (D63), Dinsmore, California at an unknown time, and ultimately destined for Nashua Airport, New Hampshire.

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 report, toxicology findings, and the investigator's reports were reviewed. Relevant regulation and medical literature were reviewed as appropriate.

FAA Medical Case Review

According to the FAA medical case review, the 52 year old male pilot had not reported any flight hours as of his last medical exam, dated 8/17/2017. At that time, he was 72 inches tall and weighed 240 pounds. He reported no chronic medical problems and no use of medications to the FAA. No

significant abnormalities were identified on the physical exam and he was issued a third class medical certificate without limitations. The pilot's most recent medical certificate had expired for all classes on 8/31/2019 and he had not applied for BasicMed.

Autopsy

According to the autopsy performed at the request of the Power County Coroner's Office, the cause of death was traumatic blunt force injuries. There was extensive damage and the brain was not available for a complete examination. However, severe atherosclerotic stenosis (90-95%) of the proximal left anterior descending coronary artery was identified.

Toxicology

Testing performed on femoral blood as part of the autopsy identified Delta-9-tetrahydrocannabinol (THC, the primary psychoactive compound in marijuana) at 8.7 ng/ml; its inactive metabolite Delta-9-Carboxy-THC at 20 ng/ml; and its active metabolite 11-Hydroxy-Delta-9-THC at 1.0 ng/ml.

Toxicology testing performed by the FAA's Forensic Sciences Laboratory on cavity blood identified 24.1 ng/ml of the parent compound, Delta-9-THC; 18.3 ng/ml of the inactive Delta-9-Carboxy-THC and trace amounts of 11-Hydroxy-Delta-9-THC (<1.0 ng/ml). All three analytes were also identified in urine.

Drug Descriptions

The marijuana plant (*Cannabis sativa*) contains chemicals called cannabinoids; delta-9-tetrahydrocannabinol (THC) is the primary psychoactive cannabinoid compound. THC's mood-altering effects include euphoria and relaxation. In addition, marijuana causes alterations in motor behavior, perception, cognition, memory, learning, endocrine function, food intake, and regulation of body temperature. Specific performance effects include decreased ability to concentrate and maintain attention. Impairment in retention time and tracking, subjective sleepiness, distortion of time and distance, vigilance, and loss of coordination in divided attention tasks have been reported. Significant performance impairments are usually observed for at least 1-2 hours following marijuana use, and residual effects have been reported up to 24 hours.¹

THC is rapidly metabolized but the rate of metabolism is not linear and depends on the means of ingestion (smoking, oil, and edibles), potency of the product, frequency of use, and user characteristics. The primary metabolite, 11-hydroxy-delta-9-THC, is equally psychoactive, but is

¹ National Highway Traffic Safety Administration. April 2014. Drugs and Human Performance Fact Sheets. Cannabis/Marijuana. <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drugshumanperformfs.pdf>

rapidly metabolized to the non-psychoactive metabolite Delta-9-Carboxy-THC. Concentrations of both analytes decline rapidly and are often < 5 ng/mL at 3 hours. Significant THC concentrations (7 to 18 ng/mL) are noted following even a single puff or hit of a marijuana cigarette.

THC is fat soluble, so it is stored in fatty tissues (particularly liver and lung if it is being smoked) and can be released back into nearby blood long after consumption or even after death (a process known as postmortem redistribution).

D. SUMMARY OF MEDICAL FINDINGS

The 52 year old male pilot had reported no chronic conditions or use of medications to the FAA and had allowed his medical certificate to expire.

According to the autopsy performed at the request of the Power County Coroner's Office, the cause of death was traumatic blunt force injuries. There was extensive damage and the brain was not available for a complete examination. In addition, severe atherosclerotic stenosis (90-95%) of the proximal left anterior descending coronary artery was identified.

Testing performed on femoral blood as part of the autopsy identified Delta-9-tetrahydrocannabinol (THC, the primary psychoactive compound in marijuana) at 8.7 ng/ml; its inactive metabolite Delta-9-Carboxy-THC at 20 ng/ml and its active metabolite 11-Hydroxy-Delta-9-THC at 1.0 ng/ml.

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