

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



CEN22FA383

MEDICAL

Specialist's Factual Report

December 28, 2022

A. ACCIDENT

Location: Hanna City, Illinois
Date: August 13, 2022
Time: 12:31 Local
Airplane: Mooney M20K; N30EV

B. MEDICAL SPECIALIST

Specialist Michelle Watters, MD, PhD, MPH
National Transportation Safety Board, RE-1
Washington, DC

C. DETAILS OF THE INVESTIGATION

Purpose

This investigation was performed to evaluate the pilot for medical conditions, the use of medications/illicit drugs, and the presence of toxins.

Methods

The Federal Aviation Administration (FAA) medical case review and the pilot's autopsy and FAA Forensic Sciences Laboratory toxicology reports¹ were reviewed. Other relevant medical and regulatory issues were reviewed.

D. FACTUAL INFORMATION–PILOT

1.0 FAA Medical Case Review

According to the FAA medical case review, at the time of the accident, the 75-year-old male pilot had an expired BasicMed certificate (issued 6/3/20 but required course renewal completion by 6/3/22). He previously held a third class medical certificate with the limitation that he must wear lenses for distant, have glasses for near vision. His most recent FAA medical certification examination was on 4/28/16. At that exam he reported 2,900 total flight hours and he reported taking nifedipine, losartan, and chlorthalidone to treat high blood pressure.

¹ The FAA Forensic Sciences Laboratory has the capability to test for more than 1,300 substances including toxins, common prescription and over-the-counter medications, and illicit drugs.
<https://jag.cami.jccbi.gov/toxicology/>

2.0 Autopsy

According to the autopsy report from the Peoria County Coroner's Office, Peoria Illinois, the pilot's cause of death was multiple blunt force injuries. The body was 65 inches long and weighed 167 pounds. There was evidence of medical intervention including an endotracheal tube and intravascular catheters. No significant natural disease was identified by the forensic pathologist.

3.0 Toxicology

Toxicology testing performed for the coroner's office was positive for caffeine and quinine in the pilot's cardiac blood. Toxicology testing performed by the FAA Forensic Sciences Laboratory detected the inactive metabolite of delta-9-tetrahydrocannabinol (THC), carboxy-delta-9-tetrahydrocannabinol (THC-COOH), in the pilot's heart blood at 2.2 nanograms per milliliter (ng/mL) and in urine at 18.9 ng/mL. THC's short-lived psychoactive metabolite, 11-hydroxy-delta-9-THC (11-OH-THC) was detected in his urine at 3.4 ng/mL, but not in his blood. The non-impairing high blood pressure medication chlorthalidone was detected in his heart blood and urine.² Quinine was also detected in his heart blood and urine; quinine is a non-impairing medication used in the treatment of malaria and leg cramps and as an additive in tonic water.³

Cannabis

The marijuana plant (*Cannabis species*) 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, time and space perception, and cognition. 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.⁴

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. Concentrations of THC peak at the end of smoking and often below 5 ng/mL at three hours. The primary metabolite of THC, 11-hydroxy-delta-9-THC, is equally psychoactive, but is rapidly metabolized to the non-psychoactive metabolite THC-COOH. THC is fat soluble, so is stored in

² FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Chlorthalidone.
<https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=342>

³ FAA. Updated 1/16/19. Forensic Toxicology's WebDrugs. Quinine.
<https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=119>

⁴ National Highway Traffic Safety Administration. April 2014 (revised). Drugs and Human Performance Fact Sheets. Cannabis/Marijuana.
<https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drugshumanperformfs.pdf>

fatty tissues and can be released back into the blood long after consumption. So, while the psychoactive effects may last a few hours, THC can be detected in the body for days or weeks. Very little THC is excreted in urine. Instead, THC-COOH can be found in urine days to weeks after the last use of the drug. Thus, both blood and urine test results do not necessarily reflect recent use and cannot be used to prove that the user was experiencing effects of the drug at the time of testing.⁵

E. SUMMARY OF MEDICAL FACTS

The 75-year-old male pilot had a BasicMed certificate that expired in June 2022. He previously held a third class medical certificate with the limitation that he must wear lenses for distant, have glasses for near vision. At his most recent FAA medical certification examination on 4/28/16, he reported medications for treating high blood pressure. According to the autopsy report, the pilot's cause of death was multiple blunt force injuries. No significant natural disease was identified by the forensic pathologist.

Toxicology testing detected carboxy-delta-9-tetrahydrocannabinol (THC-COOH), in the pilot's heart blood at 2.2 nanograms per milliliter (ng/mL) and in urine at 18.9 ng/mL. 11-hydroxy-delta-9-THC (11-OH-THC) was detected in his urine at 3.4 ng/mL, but not in his blood. The non-impairing medications chlorthalidone and quinine were detected in the pilot's heart blood and urine.

Submitted by:

Michelle Watters, MD, PhD, MPH
Medical Officer, RE-1

⁵ Compton, R. July 2017. Marijuana-Impaired Driving - A Report to Congress. (DOT HS 812 440). Washington, DC: National Highway Traffic Safety Administration.
<https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812440-marijuana-impaired-driving-report-to-congress.pdf>