

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



HWY22FH008

MEDICAL

Specialist's Factual Report

February 14, 2023

A. ACCIDENT

Location: Tishomingo, Oklahoma
Date: March 22, 2022
Time: 12:19 Local
Vehicles: 1994 Peterbilt truck-tractor in combination with a 2017 Travis trailer
2015 Chevrolet Spark

B. MEDICAL SPECIALIST

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C. DETAILS OF THE INVESTIGATION

Purpose

This investigation was performed to evaluate the truck driver and Chevrolet driver involved in this accident for medical conditions and the use of medications and illicit drugs.

Methods

The following records were reviewed: the truck driver's Federal Motor Carrier Safety Administration (FMCSA) commercial driver's license medical examination report and the Oklahoma State Bureau of Investigation (OSBI) and the Federal Aviation Administration (FAA) Forensic Sciences Laboratory toxicology reports and the Chevrolet driver's report of examination by medical examiner, FAA Forensic Sciences Laboratory toxicology report, and personal medical records. Other pertinent medical and regulatory issues were reviewed.

D. FACTUAL INFORMATION

1.0 Relevant Statute and Regulation

Federal Regulations—Department of Transportation

Commercial drivers must undergo a medical examination including a medical history, review of medications, and physical examination to demonstrate they are medically certified as physically qualified to operate a commercial motor vehicle. Beginning in 2014, health care providers performing these examinations are required to have been certified by the FMCSA.

According to Title 49 Code of Federal Regulations (CFR) Section 391.41(a) (3), a person is physically qualified to drive a commercial motor vehicle if:

(i) That person meets the physical qualification standards in paragraph (b) of this section and has complied with the medical examination requirements in §391.43; or

(ii) That person obtained from FMCSA a medical variance from the physical qualification standards in paragraph (b) of this section and has complied with the medical examination requirement in §391.43.

Cannabis Legislation

According to Title 21 United States Code (USC) Controlled Substances Act, Section 812, tetrahydrocannabinol (THC), the psychoactive component of *Cannabis* (marijuana), is listed as a Schedule I controlled substance.¹ In June 2018, Oklahoma legalized the use and possession of medical marijuana; possession and sale of recreational marijuana is illegal ([Oklahoma Statutes](#) Title §63-420 and §63-2-101). In Oklahoma, driving under the influence includes having any amount of a schedule I controlled substance (including marijuana and medical marijuana) or its metabolites in a person's blood, urine, saliva, or bodily fluid.²

2.0 Truck Driver

The male truck driver was 51 years old at the time of the accident.

2.1 Commercial Driver's License Medical Examination

The truck driver's most recent examination was dated October 18, 2021. The certified medical examiner documented the truck driver's corrected visual acuity as 20/25 for both eyes with 90-degree field of vision for each eye. He had normal hearing and his physical examination had normal findings. The examiner reported the truck driver met the requirements established by 49 CFR 391.41 but required periodic monitoring for hypertension and diabetes; he was qualified for one year with a requirement to wear corrective lenses.

The same examiner performed the truck driver's previous commercial driver's license medical examination on October 19, 2020. The truck driver's medical history and his physical examination findings were comparable except that he did not require corrective lenses.

¹ U.S. Department of Justice (DOJ), Drug Enforcement Administration (DEA), Office of Diversion Control, [Controlled Substance Schedules \(usdoj.gov\)](#) Accessed 4/21/22.

² [Laws | Oklahoma Highway Safety Office](#) Accessed 4/21/22.

2.2 Toxicology

According to the OSBI's criminalistics examination report, no ethanol or tested-for drugs were detected in the truck driver's blood specimen. The FAA Forensic Sciences Laboratory did not detect any tested-for drugs in the truck driver's blood.³

3.0 Chevrolet Driver

The female Chevrolet driver was 16 years old at the time of the accident.

3.1 Autopsy

No autopsy was performed on the Chevrolet driver. According to the Board of Medicolegal Investigations, Office of the Chief Medical Examiner, Oklahoma City, Oklahoma report of investigation by medical examiner, the cause of the Chevrolet driver's death was multiple blunt force injuries, and the manner of death was accident.

3.2 Toxicology

Toxicology testing performed by the medical examiner's office on the Chevrolet driver's cavity blood drawn seven hours postmortem screened positive for cannabinoids and negative for alcohol. Toxicology testing by the FAA Forensic Sciences Laboratory on this cavity blood sample detected marijuana's primary psychoactive compound delta-9-tetrahydrocannabinol (THC) at 95.9 nanograms per milliliter (ng/mL). THC's psychoactive metabolite 11-hydroxy-delta-9-THC (11-OH-THC) and THC's inactive metabolite carboxy-delta-9-tetrahydrocannabinol (THC-COOH) were detected in this cavity blood at 16.7 ng/mL and 178.1 ng/mL, respectively.⁴

3.3 Personal Medical Records

Personal medical records were obtained for the Chevrolet driver for three years prior to the accident. Her most recent visit for a physical examination was on 7/15/20 for an annual routine follow-up for scoliosis. She complained of occasional back pain. She had no medications reported in her record.

³ 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/>

⁴ Toxicological testing by FAA of a cavity blood sample collected from the Chevrolet driver approximately 23 hours postmortem detected THC at 1,187.4 ng/mL, 11-OH-THC at 7.4 ng/mL, and THC-COOH at 88.4 ng/mL. These results suggest the two collection sites were different and that the results from the sample collected at 23 hours may reflect contamination from THC present in her lung tissue.

4.0 Information Regarding Drugs Detected on Toxicology

The marijuana plant (*Cannabis species*) contains chemicals called cannabinoids; tetrahydrocannabinol (THC) is the primary psychoactive cannabinoid compound. THC's mood-altering effects include euphoria and relaxation. In addition, cannabis causes alterations in motor behavior, time and space perception, and cognition. Effects from smoking cannabis are felt within minutes. Significant performance impairments are usually observed for at least 1-2 hours following cannabis use, and residual effects have been reported up to 24 hours.⁵ A study of 14 frequent and 11 occasional users found that cannabis significantly impaired psychomotor function up to 3.5 hours after smoking, although more impairment was reported in occasional smokers.⁶ A crossover study of 17 adults found THC blood concentrations were higher following vaporized versus smoked cannabis for all doses administered and that vaporized cannabis produced greater subjective effects and cognitive and psychomotor impairment.⁷

THC is rapidly metabolized, but the rate of metabolism is not linear and depends on the route of exposure (inhalation, absorption, and ingestion), potency of the product, frequency of use, and user characteristics. Concentrations of THC peak during the act of smoking and often reach 100 to 200 ng/mL. Blood levels generally fall below 5 ng/mL at three hours. The primary metabolite, 11-OH-THC, is equally psychoactive, but is rapidly metabolized to the non-psychoactive metabolite THC-COOH.^{4,8}

E. SUMMARY OF MEDICAL FACTS

The 51-year-old male truck driver held a one-year commercial driver medical certificate that had the requirement that he wear corrective lenses. His post-accident toxicological testing was negative for ethanol and tested-for drugs in blood.

The 16-year-old female Chevrolet driver's cause of death was multiple blunt force injuries, and the manner of death was accident. Postmortem toxicology testing

⁵ National Highway Traffic Safety Administration. April 2014 (revised). Drugs and Human Performance Fact Sheets. Cannabis/Marijuana. [809725-drugshumanperformfs.pdf \(nhtsa.gov\)](https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/809725-drugshumanperformfs.pdf)

⁶ Desrosiers, NA, JG Ramaekers, E Chauchard, DA Gorelik, and MA Huestis. 2015. Smoked cannabis' psychomotor and neurocognitive effects in occasional and frequent smokers. *Journal of Analytical Toxicology* 39:252-261.

⁷ Spindle, TR, EJ Cone, NJ Schlienz, JM Mitchell, GE Bigelow, R Flegel, E Hayes, and R Vandrey. 2018. Acute effects of smoked and vaporized cannabis in healthy adults who infrequently use cannabis. *JAMA Open Network*. 1(7): e184841. doi:10.1001/jamanetworkopen.2018.484.

⁸ 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>

of the Chevrolet driver's cavity blood drawn seven hours postmortem detected THC at 95.9 ng/mL, 11-OH-THC at 16.7 ng/mL, and THC-COOH at 178.1 ng/mL.

Submitted by:

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