National Transportation Safety Board
Office of Research and Engineering
Washington, DC 20594

RRD22MR010

MEDICAL

Specialist's Factual Report

February 10, 2023

TABLE OF CONTENTS

A. ACCIDENT

Location: Mendon, Missouri
Date: June 27, 2022

B. MEDICAL SPECIALIST

Specialist: Turan Kayagil, MD, FACEP
National Transportation Safety Board
Washington, DC

C. DETAILS OF THE INVESTIGATION

1.0 Purpose

This investigation was performed to evaluate the involved truck driver for potentially impairing medical conditions and substance use.

2.0 Methods

The truck driver's autopsy and postmortem toxicology reports were reviewed. Selected investigator reports and relevant regulation and medical literature were also reviewed. As addressed in the Highway Safety Group Chairman's Factual Report, the truck driver did not hold a commercial motor vehicle (CMV) driver medical certificate.

D. FACTUAL INFORMATION

1.0 Autopsy

The Boone/Callaway County Medical Examiner's Office performed the 53-year-old male truck driver's autopsy at the request of the Chariton County Coroner. According to the autopsy report, the truck driver's cause of death was multiple blunt force injuries. The autopsy did not identify significant natural disease.

2.0 Toxicology

2.1 NMS Labs Toxicology

At the request of the Medical Examiner's Office, NMS Labs performed postmortem toxicology testing of cavity blood from the truck driver. Ethanol was detected at 0.012 g/dL. Caffeine, nicotine, and cotinine were presumptively detected (not confirmed by a second test).

2.2 FAA Toxicology

At the request of the NTSB, the Federal Aviation Administration (FAA) Forensic Sciences laboratory performed toxicological testing of postmortem specimens from the truck driver.[1] Ethanol was detected at 0.012 g/dL in blood but was not detected in vitreous or urine.[2] N-propanol was also detected in blood.

2.3 Descriptions of Detected Substances

Ethanol is a type of alcohol. It is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance. In Missouri, it is illegal to operate a CMV with a blood ethanol level of 0.04 g/dL or higher.[3] However, ethanol found in postmortem specimens does not always represent ethanol consumed before death. Ethanol can be produced by microbes in a person's body after death. In general, urine and especially vitreous are less susceptible to such postmortem ethanol production than is blood (especially cavity blood in the setting of major trauma).[4,5] N-propanol is another alcohol that can be produced by microbes in a person's body after death.[5]

Caffeine is a central nervous system stimulant that is commonly ingested, including in coffee, tea, soft drinks, and chocolate; it is also an ingredient in certain anti-drowsiness medications and headache medications.[6,7,8] Nicotine is a chemical

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[1] The FAA Forensic Sciences laboratory has the capability to test for well over 1300 substances including toxins, prescription and over-the-counter medications, and illicit drugs. Some of these substances are listed at https://jag.cami.jccbi.gov/toxicology.

[2] The collection site of the blood used for FAA testing was not specified; the autopsy report only mentions the peritoneal cavity collection site used for NMS Labs testing. According to an e-mail from an FAA forensic toxicologist, the FAA Forensic Sciences laboratory uses a reporting threshold for ethanol of 0.01 g/dL.

[3] Missouri Commercial Driver License Manual. Missouri Department of Revenue. May 18, 2021 (revised). https://dor.mo.gov/forms/CDL%20Manual.pdf. Accessed November 16, 2022.

[4] Spitz WU. Forensic aspects of alcohol. In: Spitz WU, Spitz DJ, eds. *Spitz and Fisher's Medicolegal Investigation of Death: Guidelines for the Application of Pathology to Crime Investigation*. 4th ed. Springfield, IL: Charles C Thomas; 2006:1218-1229.

[5] Kugelberg FC, Jones AW. Interpreting results of ethanol analysis in postmortem specimens: a review of the literature. *Forensic Sci Int*. 2007;165(1):10-29. doi: 10.1016/j.forsciint.2006.05.004.

[6] Federal Aviation Administration Civil Aerospace Medical Institute. Caffeine. Forensic Toxicology's WebDrugs. https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=24. Updated January 16, 2019. Accessed November 15, 2022.

[7] National Institutes of Health National Library of Medicine. NoDoz Alertness Aid. DailyMed. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=e700e809-29b5-799e-e053-2a95a90a235c. Updated October 11, 2022. Accessed November 15, 2022.

[8] National Institutes of Health National Library of Medicine. Fioricet. DailyMed. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=c018be7d-f7b8-45e2-97b8-8e7a71740657. Updated

that is found in tobacco products, electronic cigarette liquid, and certain smoking cessation aids.[9,10] Cotinine is a metabolite of nicotine.[11] Caffeine, nicotine, and cotinine generally are not considered impairing.

E. SUMMARY OF MEDICAL FACTS

The Boone/Callaway County Medical Examiner's Office performed the 53-year-old male truck driver's autopsy at the request of the Chariton County Coroner. According to the autopsy report, the truck driver's cause of death was multiple blunt force injuries. The autopsy did not identify significant natural disease.

At the request of the Medical Examiner's Office, NMS Labs performed postmortem toxicology testing of cavity blood from the truck driver. Ethanol was detected at 0.012 g/dL. Caffeine, nicotine, and cotinine were presumptively detected.

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Submitted by:

Turan Kayagil, MD, FACEP
Medical Officer

January 1, 2021. Accessed November 15, 2022.

[9] Federal Aviation Administration Civil Aerospace Medical Institute. Nicotine. Forensic Toxicology's WebDrugs. https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=184. Updated January 16, 2019. Accessed November 15, 2022.

[10] National Institutes of Health National Library of Medicine. Nicorette. DailyMed. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=991704ed-781a-489b-8b56-0b558e8fc385. Updated November 16, 2020. Accessed November 15, 2022.

[11] Federal Aviation Administration Civil Aerospace Medical Institute. Cotinine. Forensic Toxicology's WebDrugs. https://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=132. Updated January 16, 2019. Accessed November 15, 2022.