



# **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Research and Engineering  
Washington, DC

## **Medical Factual Report** **September 5, 2019**

Michelle Watters, MD, PhD, MPH  
Medical Officer

### **A. CRASH INFORMATION: HWY19FH008 – Delray Beach, Florida**

Location: 14000 block of State Highway 441 (US 441) in Delray Beach,  
Palm Beach County, Florida  
Vehicle #1: 2018 Tesla Model 3  
Operator #1: Private operator  
Vehicle #2: 2019 International truck-tractor in combination with a semi-trailer  
Operator #2: FirstFleet, Inc.  
Murfreesboro, TN  
Date: March 1, 2019  
Time: 6:17 a.m. EST

### **B. GROUP IDENTIFICATION**

No group was formed for the medical evaluation in this accident.

### **C. RELEVANT STATUTE AND REGULATION**

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. 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 [Federal Motor Carrier Safety Administration] 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.

According to 49 CFR Section 391.41(b) a person is physically qualified to drive a commercial motor vehicle if, among other itemized physical qualifications, that person –

(8) Has no established medical history or clinical diagnosis of epilepsy or any other condition which is likely to cause loss of consciousness or any loss of ability to control a commercial motor vehicle;

(9) Has no mental, nervous, organic, or functional disease or psychiatric disorder likely to interfere with his/her ability to drive a commercial motor vehicle safely;

(10) Has distant visual acuity of at least 20/40 (Snellen) in each eye without corrective lenses or visual acuity separately corrected to 20/40 (Snellen) or better with corrective lenses, distant binocular acuity of at least 20/40 (Snellen) in both eyes with or without corrective lenses, field of vision of at least 70° in the horizontal Meridian in each eye, and the ability to recognize the colors of traffic signals and devices showing standard red, green, and amber.

According to 49 CFR, Part 40, Subpart B, employers are required to have employees meeting the 49 CFR Part 382 undergo testing for controlled substances and alcohol. U.S. Department of Transportation (DOT) mandated urine drug testing for commercial vehicle drivers is required pre-employment, annually for a random sample of 25% of commercial drivers, and following accidents. DOT urine tests identify use of amphetamine, methamphetamine, cocaine, codeine, morphine, heroin, phencyclidine, methylenedioxymethamphetamine (MDMA), methylenedioxyamphetamine (MDA), methylenedioxyethylamphetamine (MDEA), and marijuana.<sup>1</sup>

## **D. DETAILS OF INVESTIGATION**

### **1. Purpose**

This investigation was performed to evaluate the two drivers involved in this accident for any medical conditions, the use of any medications/illicit drugs, and the presence of any toxins.

### **2. Methods**

The Tesla driver's autopsy and toxicology results and the truck driver's recent commercial driver medical examination forms, DOT alcohol and controlled substance test results, personal medical records, and transcripts from his post-accident interview with NTSB<sup>2</sup> were reviewed. Other pertinent scientific and regulatory issues were examined.

### **Tesla Driver**

#### Autopsy

According to the autopsy performed by the Office of the District Medical Examiner, West Palm Beach, FL, the cause of the 50-year old male Tesla driver's

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<sup>1</sup> U.S. Department of Transportation, Drug and Alcohol testing DOT Rule 49 CFR Part 40 Section 40.87 - cutoff concentrations for drug tests. <https://www.transportation.gov/odapc/part40/40-87> Accessed 5/24/2019.

<sup>2</sup> For transcripts, see *Human Performance Attachment NTSB Interview with Truck Driver* in the docket for this investigation.

death was blunt force injuries to head and the manner of death was accident. There was some evidence of atherosclerotic disease; the middle segment of the left anterior descending coronary artery was 75% stenosed by an eccentric fibrofatty plaque and the right coronary artery had stenosis of 20% from several plaques. There were a few scattered plaques found in the aorta. There was no evidence that suggested any acute coronary event. According to the medical examiner's report, the Tesla driver's wife denied that the decedent had any medical conditions, took any medications, or had a history of drug or alcohol abuse.

### Toxicology

Toxicology testing performed by the Federal Aviation Administration's (FAA) Forensic Sciences Laboratory did not identify ethanol or other tested-for substances in muscle.<sup>3</sup> Both blood and urine specimens were negative for a panel of drugs of abuse in laboratory testing ordered by the Office of the District Medical Examiner.<sup>4</sup>

## **Truck Driver**

### Commercial Driver Medical Examination

Medical records were obtained for the truck driver from an urgent care center in Florida that performed DOT physicals and drug screens, as well as provided acute care service for self-limiting conditions such as upper respiratory tract infections between December 2015 and November 2017. On the DOT commercial driver fitness determination form that was completed pre-employment for FirstFleet on December 8, 2015, the driver reported that he had no seizures or epilepsy in his health history and reported no use of any medication. The truck driver's uncorrected visual acuity was right eye 20/25, left eye 20/30, and both eyes 20/20.

Similarly, on his recertification commercial driver medical physical on November 19, 2017, the truck driver reported that he had no medical conditions including seizures or epilepsy in his health history and reported no use of any medication. He reported right shoulder surgery in 2011, a lap Nissen surgery (performed to treat gastroesophageal reflux disease and hiatal hernia) in 2011, and eye surgery in 2012.<sup>5</sup> His uncorrected visual acuity was right eye 20/30, left eye 20/25, and both eyes 20/20. The records obtained from the urgent care center also included federal drug testing and control forms for three post-accident DOT urine drug testing on January 5, 2016, February 27, 2017, and May 1, 2017.

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<sup>3</sup> The FAA Forensic Sciences Laboratory tests for more than 1,300 substances including toxins, common prescription and over-the-counter medications as well as illicit drugs. <http://jag.cami.jcabi.gov/toxicology/>.

<sup>4</sup> Toxicology testing was performed by Axis Forensic Toxicology. Drugs of abuse panel for blood included amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine/metabolites, fentanyl, methadone/metabolite, opiates, oxycodone/metabolite, phencyclidine, propoxyphene/metabolite, alcohol, analgesics, buprenorphine, stimulants, and tramadol/metabolite. Drugs of abuse panel for urine included amphetamines, benzodiazepines, buprenorphine/metabolite, cannabinoids, carisoprodol/metabolite, cocaine/metabolites, fentanyl, methadone/metabolite, opiates (including oxycodone), phencyclidine, and tramadol/metabolite. Insufficient volume was noted for urine barbiturates testing.

<sup>5</sup> In the post-accident interview, the truck driver stated his eye surgeries were performed in 2011.

### Toxicology

DOT post-accident toxicology testing on March 1, 2019 was negative for tested-for drugs in urine and negative for breath alcohol.

### Pharmacy Records

Pharmacy records were obtained from two nationally based pharmacies. The first pharmacy's records included prescriptions filled in Florida between July 2016 and April 2018. In addition to several antibiotics, there was one prescription for the pain medication hydrocodone/ibuprofen<sup>6</sup> on April 15, 2018. The muscle relaxant, metaxalone<sup>7</sup>, was filled three times between July and October 2016. Prescriptions for the anticonvulsant medication levetiracetam (often marketed as Keppra)<sup>8</sup> were filled on July 2, 2016, July 20, 2016, September 12, 2016, and October 25, 2016.

The second national pharmacy provided a spreadsheet that included prescription purchases in Florida between September 2017 and February 2019. Metaxalone was purchased in September 2017. The nonsteroidal anti-inflammatory meloxicam<sup>9</sup> and the antacid sucralfate<sup>10</sup> (marketed as Carafate) were purchased in February 2019. Sertraline<sup>11</sup>, an antidepressant medication, was first prescribed and then purchased on February 20, 2019. Three, 270 tablet prescriptions for levetiracetam were purchased on September 22, 2017, May 19, 2018, and February 18, 2019.

### Personal Medical Records

In addition to the urgent care center records described in the commercial driver medical examination section, records were obtained from the truck driver's primary care doctor. On June 9, 2017, the truck driver established care with the primary care doctor. He provided his history of having been on anti-seizure medication since the age of 14. He reported three lifetime seizures and that when he had been taken off anti-seizure medications, he had a seizure. He was not

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<sup>6</sup> National Institutes of Health. National Library of Medicine. Daily Med. Hydrocodone and Ibuprofen. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=abc33718-4e88-43ea-9ffa-2b04ffc812ef> Updated 8/14/19.

<sup>7</sup> National Institutes of Health. National Library of Medicine. Daily Med. Metaxalone. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=b3a4f6bc-abd4-4b8e-970f-59b3aa6f17a0> Updated 6/12/17.

<sup>8</sup> National Institutes of Health. National Library of Medicine. Daily Med. Keppra. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=3ca9df05-a506-4ec8-a4fe-320f1219ab21> Updated 11/5/19.

<sup>9</sup> National Institutes of Health. National Library of Medicine. Daily Med. Meloxicam. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=4ec9bf84-d0b0-4092-8e3d-c67ccfb2780b> Updated 1/1/07.

<sup>10</sup> National Institutes of Health. National Library of Medicine. Daily Med. Carafate-sucralfate tablet. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=c87c6b50-6977-4fa7-ae98-40c0753f7aee> Updated 2/28/19.

<sup>11</sup> National Institutes of Health. National Library of Medicine. Daily Med. Sertraline. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f9641190-9151-4f7e-89ff-1e7a818c30ee> Updated 5/29/13.

aware of being diagnosed with any specific type of seizures. His reported surgeries were for his right shoulder and to treat gastroesophageal reflux disease and hiatal hernia in 2011, and bilateral eye surgery in 2012.<sup>12</sup> The truck driver also had complaints of low back pain and back spasms.

The truck driver's second primary care office visit was on February 11, 2019. At the time of this exam, the 45-year old truck driver was 68 inches tall and weighed 224 pounds (body mass index 34). He had multiple concerns including joint aches and stiffness, stomach issues, and "feeling down". In addition to a plan of care to address the first two concerns, the truck driver's prescription for levetiracetam for his seizure disorder was refilled and he was prescribed sertraline for his new diagnosis of major depressive disorder.

### Information Regarding Medical Conditions and Medications

#### *Epilepsy and Seizures*

A seizure is defined as "a transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain." There are three basic operational seizure types which have additional descriptors as to the prominence of motor or nonmotor features.<sup>13</sup> Thus, seizures can manifest in many ways including muscle contractions or a lapse of awareness. Most seizures last a couple of minutes. People who experience two or more unprovoked seizures receive a diagnosis of epilepsy. While some forms of epilepsy require lifelong treatment, for others, the seizures may decrease or even stop over time. Most seizures can be controlled with use of single drug therapy.<sup>14</sup>

#### *Sertraline*

Sertraline (marketed as Zoloft), a selective serotonin reuptake inhibitor (SSRI), is a prescription medication used to treat several conditions including depression, obsessive-compulsive disorder, and social anxiety disorder. Sertraline carries a warning regarding increased risk of suicide in adolescents and young adults. Since the drug has not been systematically evaluated in patients with seizure disorders, sertraline should be prescribed with caution for these patients. Sertraline is less likely than other antidepressants to cause drowsiness, although patients are

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<sup>12</sup> In the post-accident interview with the truck driver, the bilateral eye surgery was described as providing the driver with the ability to read with his right eye and see distance in his left, often referred to as monovision. Monovision, or blended vision, is achieved with contact lenses or refractive surgery. Both eyes still work together to see clearly at any distance, but there may be some loss of depth perception. Depth perception, the ability to see things in three dimensions and judge distance, involves both binocular and each separate eye's input. Over time, the brain of people with monovision or monocular vision (vision primarily in one eye) adjust to have acceptable depth perception. (American Academy of Ophthalmology, <https://www.aaopt.org/eye-health/treatments/what-is-monovision-blended-vision>, accessed 6/17/19.)

<sup>13</sup> International League Against Epilepsy (ILAE). 2017. Operational classification of seizure types by the International League Against Epilepsy: Position Paper of the ILAE Commission for Classification and Terminology. Fisher, R.S., et al. *Epilepsia* 58(4):522-530. [https://www.ilae.org/files/dmfile/Operational-Classification--Fisher\\_et\\_al-2017-Epilepsia.pdf](https://www.ilae.org/files/dmfile/Operational-Classification--Fisher_et_al-2017-Epilepsia.pdf)

<sup>14</sup> National Institute of Health (NIH). National Institute of Neurological Disorders and Stroke. <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Hope-Through-Research/Epilepsies-and-Seizures-Hope-Through> Accessed 6/6/19.

advised to avoid driving or operating machinery until full effects of the drug are known.<sup>15</sup>

## **E. SUMMARY OF MEDICAL FINDINGS**

The 50-year old male Tesla driver's autopsy identified moderate atherosclerotic disease, but no evidence of any acute coronary event. Toxicology testing performed by two laboratories did not identify any tested-for substances.

The 45-year old male commercial truck driver had reported no medical conditions and no medication use on his most recent commercial driver examination long form dated November 19, 2017. He reported having eye surgery in 2012. His uncorrected visual acuity was right eye 20/25, left eye 20/30, and both eyes 20/20. DOT post-accident toxicology testing of urine on March 1, 2019 was negative for tested drugs and breath alcohol.

Pharmacy records and personal medical records revealed that the truck driver had a long-time diagnosis of seizures and had been taking the anticonvulsant medication levetiracetam. The truck driver reported having seizures when taken off anti-seizure medications. About three weeks prior to the accident, the truck driver had been started on sertraline for newly diagnosed depression.

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<sup>15</sup> Drugs.com. FDA [Food and Drug Administration] Professional Drug Information. Sertraline. <http://www.drugs.com/pro/sertraline.html> Accessed 6/6/2019.