



# **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Research and Engineering  
Washington, DC

## **Medical Factual Report**

**January 23, 2020**

Mary Pat McKay, MD, MPH  
Chief Medical Officer

### **A. ACCIDENT: CEN19FA093; Summersville, MO**

On March 5, 2019, about 2204 central standard time, a Piper PA 28-180 airplane, N7369W, was substantially damaged when it impacted trees and terrain 4 miles northwest of Summersville, Missouri. The pilot was fatally injured. The airplane was owned and piloted by private individuals and operated under the provisions of Title 14 Code of Federal Regulations Part 91 without a flight plan. Dark night visual meteorological conditions prevailed at the time of the accident. The cross-country flight departed New River Valley Airport (PSK), Dublin, Virginia, at an unknown time and was en route to Downtown Airport (3DW), Springfield, Missouri.

### **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 as well as to report on the extent and severity of his injuries.

#### **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 64 year old male pilot reported 652 total flight hours as of his last medical exam, dated

8/28/2018. At that time, he was 70 inches tall and weighed 211 pounds. He had reported longstanding hypothyroidism and high blood pressure to the FAA. At the time of his last exam, he reported using levothyroxine for his thyroid disease and a combination of lisinopril and hydrochlorothiazide for his blood pressure.<sup>1,2</sup> In addition, he reported using atorvastatin (a medication used to treat high cholesterol), colchicine (a medication used to prevent gout attacks), and meloxicam (an arthritis medication).<sup>3,4,5</sup> None of these are considered impairing. His blood pressure was in the normal range and results from a blood test demonstrated his thyroid disease was in good control. No significant abnormalities were identified on the physical exam and he was issued a third class medical certificate limited by a requirement he wear corrective lenses for distant vision and have glasses for near vision.

### Autopsy

According to the autopsy performed by Southwest Missouri Forensics, the cause of death was multiple blunt force injuries with environmental hypothermia and the manner of death was accident. There was extensive damage and the brain was not available for examination. In addition, moderate atherosclerotic stenosis (70%) of the right coronary artery was identified.

### Injuries

Injuries documented in the autopsy for the pilot were coded using the abbreviated injury scale (AIS) system which applies a severity score of 1 (minimal) to 6 (maximal) to each injury; these are grouped into nine body regions.<sup>6,7</sup> The scores are documented in a table, below.

---

<sup>1</sup> National Institutes of Health. US National Library of Medicine. DailyMed. Levothyroxine. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=a3845f91-e0fe-42aa-8043-aeaac43f8eef> Accessed 12/23/2019.

<sup>2</sup> National Institutes of Health. US National Library of Medicine. DailyMed. Lisinopril and Hydrochlorothiazide tablet. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=c40b15ec-6083-4778-bca8-3e895e5694e1> Accessed 12/23/2019.

<sup>3</sup> National Institutes of Health. US National Library of Medicine. DailyMed. Atorvastatin. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=1daa6f20-a032-4541-939d-931f36a020dd> Accessed 12/23/2019.

<sup>4</sup> National Institutes of Health. US National Library of Medicine. DailyMed. Colchicine. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=ee1583ac-c308-4beb-b602-9ecac4977026> Accessed 12/23/2019.

<sup>5</sup> National Institutes of Health. US National Library of Medicine. DailyMed. Meloxicam. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=4ec9bf84-d0b0-4092-8e3d-c67ccfb2780b> Accessed 12/22/2019.

<sup>6</sup> The likelihood of surviving an injury is related to the injury severity level. On average, if a person has a single AIS 1 injury, their likelihood of survival is 99.3% while if they have a single AIS 6 injury, their likelihood of survival is 21%. (The survival risk ratio for a single injury, which is the number of survivors with an AIS level injury divided by the total number of people with that level injury, ranges from 0.993 for AIS 1 to 0.210 for AIS 6.)

<sup>7</sup> AIS 2015. Association for the Advancement of Automotive Medicine, Chicago. IL Version 6 October 2018.

Specific injuries included: multiple abrasions, contusions, and lacerations of the body; fractures of the distal right radius, distal right ulna, left ankle, sternum, the anterior aspects of ribs 1-4 on the right, the lateral aspects of ribs 1-8 on the right, the posterior aspects of ribs 1-8 on the right and the anterior aspects of ribs 1-2 on the left and 1st lumbar vertebral body; extensive mediastinal hemorrhage; and thin subarachnoid hemorrhage of the convexities of the brain and left temporal pole. The pathologist reported the outside temperature had been 6°F the night the pilot crashed.

| <b>64-year-old Pilot Blunt Force Injuries</b> |                                                   |                             |                           |
|-----------------------------------------------|---------------------------------------------------|-----------------------------|---------------------------|
| <b>Body Region</b>                            | <b>Injury</b>                                     | <b>AIS Code<sup>8</sup></b> | <b>AIS Severity Score</b> |
| <b>External</b>                               | Multiple small facial lacerations                 | 210602                      | 1                         |
|                                               | Contusion/laceration posterior scalp 3"           | 110600                      | 1                         |
|                                               | Contusion, right forearm                          | 710402                      | 1                         |
|                                               | Contusion, left hand                              | 710402                      | 1                         |
|                                               | Multiple contusions, lower extremities            | 810402                      | 1                         |
| <b>Head</b>                                   | Subarachnoid hematoma                             | 140693                      | 2                         |
| <b>Thorax</b>                                 | Multiple unilateral rib fractures with flail      | 450213                      | 4                         |
|                                               | Fracture, left ribs 1 & 2                         | 450202                      | 2                         |
|                                               | Fracture, sternum                                 | 450804                      | 2                         |
| <b>Lumbar Spine</b>                           | Fracture, L1 Body                                 | 650630                      | 2                         |
| <b>Upper Extremity</b>                        | Fracture, distal radius, right (NFS) <sup>9</sup> | 752311                      | 2                         |
|                                               | Fracture, distal ulna, right (NFS)                | 752313                      | 2                         |
| <b>Lower Extremity</b>                        | Fracture, ankle, left (NFS)                       | 852002                      | 2                         |

An overall injury severity score (ISS) is calculated by adding the squares of the highest AIS severity code in each of the three most severely injured ISS body regions ( $ISS = A^2 + B^2 + C^2$  where A, B, C are the AIS scores of the three most injured ISS body regions).<sup>10</sup> For this pilot, his injury severity score is  $4^2 + 2^2 + 2^2 = 24$ . This places the pilot just below the "critical injury" level of 25.<sup>11</sup>

<sup>8</sup> AIS coding performed using version 2015 and verified with certified AIS coder.

<sup>9</sup> NFS = not further specified. This is used when not enough information is provided to better describe an injury.

<sup>10</sup> Baker SP, O'Neill B, Haddon W, Long WB. "The Injury Severity Score: a method for describing patients with multiple injuries and evaluating emergency care". The Journal of Trauma. 1974;14(3): 187-196.

<sup>11</sup> An ISS of 16 or more defines major trauma with a typical, average mortality rate of more than 10%. Baker SP, O'Neil B The injury severity score: an update. J Trauma 1976;16:882-5.

#### Toxicology

Toxicology testing performed by the FAA's Forensic Science Laboratory identified cetirizine at 48.3 ng/ml in blood and cetirizine and atorvastatin in urine.

#### Medication Description

Cetirizine is a sedating antihistamine often marketed with the name Zyrtec. The range of blood levels usually associated with effects is between 190 and 1450 ng/ml.<sup>12</sup>

### **D. SUMMARY OF MEDICAL FINDINGS**

The 64 year old male pilot had reported using levothyroxine for his hypothyroidism and a combination of lisinopril and hydrochlorothiazide for his blood pressure. In addition, he reported using atorvastatin (a medication used to treat high cholesterol), colchicine (a medication used to prevent gout attacks), and meloxicam (an arthritis medication) to the FAA. None of these are considered impairing.

According to the autopsy performed by Southwest Missouri Forensics, the cause of death was multiple blunt force injuries with environmental hypothermia and the manner of death was accident. In addition, moderate atherosclerotic stenosis (70%) of the right coronary artery was identified.

Specific injuries included: multiple abrasions, contusions, and lacerations of the body; fractures of the distal right radius, distal right ulna, left ankle, sternum, the anterior aspects of ribs 1-4 on the right, the lateral aspects of ribs 1-8 on the right, the posterior aspects of ribs 1-8 on the right and the anterior aspects of ribs 1-2 on the left and 1st lumbar vertebral body; extensive mediastinal hemorrhage; and thin subarachnoid hemorrhage of the convexities of the brain and left temporal pole. The calculated Injury Severity Score was 24. The pathologist reported the outside temperature had been 6°F the night the pilot crashed.

Toxicology testing performed by the FAA's Forensic Science Laboratory identified cetirizine at 48.3 ng/ml in blood and cetirizine and atorvastatin in urine.

---

<sup>12</sup> Federal Aviation Administration. Aerospace Medical Research. CAMI Toxicology Drug Information. Cetirizine. <http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=131> Accessed 12/23/2019.