NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

February 21, 2018

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Chief Medical Officer

A. ACCIDENT: CEN16FA293; Oshkosh, WI

On July 30, 2016, about 1100 central daylight time (CDT), a Larry Boam Rans S7, N6271X, departed the runway during takeoff from Whittman Regional Airport (KOSH), Oshkosh, Wisconsin. The airplane sustained substantial damage to the wing struts and fuselage. The private pilot, and sole occupant onboard, was not injured. The airplane was privately registered and operated under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed for the flight, and no instrument flight rules flight plan was filed.

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 any medical conditions, the use of any medications/illicit drugs, and the presence of any toxins.

2. Methods

   The FAA blue ribbon medical file, personal medical records, and the investigator's reports were reviewed.

   FAA Medical File

   According to the FAA files, the 72 year old male pilot received his first aviation medical certificate in 1967. At that time, he reported no chronic medical conditions and no medications. However, he failed the color vision test, missing 15 of 16 Ishihara plates. He was issued a third class medical certificate limited by a statement that disallowed night flying or flying by color signal controls. He applied for and received a second

medical certificate in 1972. No further applications for medical certificates were present in his file.

Toxicology

No post accident toxicology testing was performed as the pilot was uninjured in the accident.

Personal Medical Records

According to records obtained from the pilot's neurologist, the pilot had had symptoms consistent with Parkinson's since 2006 when tremor began in his left arm and hand. In addition, the pilot carried diagnoses of Crohn's disease, low back pain, and insomnia.

The pilot visited the neurologist on April 11, 2016, about 3½ months before the accident. At that time, he was taking a baby aspirin once a day, a combination of diphenhydramine and acetaminophen at night for sleep, mesalamine for the Crohn's disease, and rasagiline mesylate, pramipexole, a combination of carbidopa and levodopa, and amantadine for his Parkinson's. Finally, he was using 1% solution of atropine orally to treat excessive drooling as needed.

Diphenhydramine is a sedating antihistamine used to treat allergy symptoms and as a sleep aid. It is available over the counter under various names including Benadryl and Unisom. Diphenhydramine carries the following warning: may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery).[1]

Compared to other antihistamines, diphenhydramine causes marked sedation; it is also classed as a central nervous system depressant and this is the rationale for its use as a sleep aid. Altered mood and impaired cognitive and psychomotor performance may also be observed. In fact, in a driving simulator study, a single dose of diphenhydramine impaired driving ability more than a blood alcohol concentration of 0.100%.[2] The combination of diphenhydramine with acetaminophen is commonly called Tylenol PM.

[1] Federal Aviation Administration. Civil Aerospace Medical Institute. Toxicology Drug Information: Diphenhydramine. Available from: http://jag.cami.jccbi.gov/toxicology/DrugDetail.asp?did=50. Accessed 3/22/2017.

[2] Weiler JM, B.J., Woodworth GG, Grant AR, Layton TA, Brown TL, McKenzie DR, Baker TW, Watson GS., Effects of fexofenadine, diphenhydramine, and alcohol on driving performance. A randomized, placebo-controlled trial in the Iowa Driving Simulator. Ann Intern Med 2000. 132(5): 354-63.

Mesalamine, also called Asachol, is a prescription medication used to treat the colonic inflammation associated with ulcerative colitis.[3]
Parkinson's disease is a progressive, neurodegenerative disorder affecting control of the skeletal muscular system. Its characteristic features include resting tremor, rigidity, and bradykinetic movements with difficulty initiating motions or changing them once started. Rasagiline mesylate, commonly marketed as Azilect, may be used alone or in combination with other medications to treat Parkinson's. It carries a number of warnings, in particular, "Cases of patients treated with AZILECT and other dopaminergic medications have reported falling asleep while engaged in activities of daily living including the operation of motor vehicles, which sometimes resulted in accidents." These events may not be associated with the perception of sleepiness ahead of time and may occur after a year or more of treatment. In addition, this drug may cause changes in behavior such as excessive gambling or other new, intense urges.[4]

Pramipexole, commonly marketed with the name Mirapex, is another prescription drug used to treat Parkinson's. It carries the same warnings as Rasagiline mesylate; somnolence, the potential for suddenly falling asleep while in the middle of daily activities, and behavioral changes. In addition, pramipexole use can be associated with the development of hallucinations and psychosis.[5]

The combination of carbidopa and levodopa, often marketed with the name Sinemet, increase the amount of dopamine in the brain. It too can cause users to suddenly fall asleep during daily activities and has been associated with car accidents as a result. It can also cause somnolence.[6]

All four of these medications are included in the FAA's "Do not Issue" list under this statement, "Dopamine agonists used for Parkinson's disease or other medical indications: Pramipexole (Mirapex), ropinirole (Requip) and rotigotine (NeuPro). All carry warnings for suddenly falling asleep during activities of daily living."[7]

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[3] National Institutes of Health. US National Library of Medicine. DailyMed. Mesalamine. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=2c076918-09c0-49bd-bb11-db1e011d597c Accessed 4/10/2017.
[4] National Institutes of Health. US National Library of Medicine. DailyMed. Rasagiline mesylate. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=a40d0e73-3f9f-4b01-979d-402c9cdaeb60 Accessed 4/10/2017.
[5] National Institutes of Health. US National Library of Medicine. DailyMed. Pramipexole extended release. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=79d73ae4-beaf-4a99-b0f3-d66438c122bd Accessed 4/10/2017.
[6] National Institutes of Health. US National Library of Medicine. DailyMed. Carbidopa and levodopa. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=486a7e4b-ef1d-2d2c-dcb9-76ae0b69a70a Accessed 4/10/2017.
[7] Federal Aviation Administration. Guide for Aviation Medical Examiners. Pharmaceuticals (Therapeutic Medications) Do Not Issue - Do Not Fly

Amantadine is a prescription antiviral drug commonly marketed with the name Symmetrel and used to treat Influenza A infections. By unknown mechanisms, it also decreases the symptoms of tremor and rigidity in Parkinson's. Amantadine is psychoactive and may cause users to develop new psychiatric symptoms such as disorientation, confusion, depression, personality changes, agitation, aggressive behavior, hallucinations, paranoia, other psychotic reactions, and somnolence or insomnia.[8]

Atropine solution is commonly used to dilate eyes for a complete eye examination. It also decreases lacrimation and it is this effect that leads to its off-label use orally to control the amount of spit created in the mouth.[9]

During the April visit with the neurologist, the pilot's health care provider noted his tremor was worse if he became nervous and that he described experiencing cognitive impairment including "some short term memory loss moments along with names." In addition, the pilot was having some increased difficulty with slurring his speech.

As part of the pilot's follow up, the neurologist routinely administered the third portion of the Unified Parkinson's Disease Rating Scale (UPDRS III) which involves rating 18 motor examination items on a scale of 0-4, where 0 = normal, 1 = slight, 2 = mild, 3 = moderate, and 4 = severe. (See: http://tools.farmacologiaclinica.info/index.php for a copy of the scale.) Lower scores indicate fewer symptoms or signs of Parkinson's. The pilot had a high of 33 in 2013; on the review in April 2016, his score was 18.

D. SUMMARY OF MEDICAL FINDINGS

The 72 year old male sport pilot is color blind and has been diagnosed with Crohn's disease, low back pain, and insomnia as well as Parkinson's. His last FAA medical certificate was issued in 1972. According to his personal medical records, his medications at the time of the accident included baby aspirin, a combination of diphenhydramine and acetaminophen at night for sleep, mesalamine for the Crohn's disease, and rasagiline mesylate, pramipexole, a combination of carbidopa and levodopa, and amantadine for his Parkinson's. Finally, he was using 1% solution of atropine orally to treat excessive drooling as needed. The musculoskeletal symptoms including tremor and rigidity of his Parkinson's were somewhat alleviated but not eliminated by his use of medications; in April 2016, his score on the motor portion of Unified Parkinson's Disease Rating Scale was 18. In addition, he reported and his health care provider documented that his tremor

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https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/pharm/dni_dnf/ Accessed 4/10/2017.

[8] National Institutes of Health. US National Library of Medicine. DailyMed. Amantadine. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=d6e6e111-38da-43a2-b6c4-15e69b720495 Accessed 4/10/2017.

[9] National Institutes of Health. US National Library of Medicine. DailyMed. Atropine solution. https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=f7b40bf1-3063-4849-a5a0-0ac5d0d1e72a Accessed 4/10/2017.

became worse when he was nervous and that he was beginning to have some mild cognitive issues. No post accident toxicology testing was performed.