Aviation Investigation Final Report

Location:	Palmyra, Pennsylvania	**Accident Number:**	ERA21LA171
Date & Time:	April 3, 2021, 16:30 Local	**Registration:**	N577DD
Aircraft:	ROBINSON HELICOPTER CO R66	**Aircraft Damage:**	Substantial
Defining Event:	Abnormal runway contact	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot picked up the helicopter at a maintenance facility, flew it to a private heliport at his residence, where he landed briefly to pick up a package, then flew to his destination airport. Upon arriving in the area of the destination airport, the pilot entered the traffic pattern with an intended landing point of a grassy area just east of the runway.

According to the pilot, on touchdown, the helicopter was on a slight downhill slope. He felt a dynamic rollover starting, so he pulled up on the collective control stick and his right foot slipped off the right tail rotor control pedal and got stuck behind it. The helicopter then impacted the ground in a left turn from a low hover.

A postaccident examination of the helicopter did not reveal any failures or malfunctions that would have prevented normal operations, and the terrain where the accident occurred was flat.

A neighbor who lived near the pilot reported that the pilot “buzzed” his home, flying about 20 ft above his roof when the pilot was landing at his private heliport. The neighbor stated this was uncharacteristic for the pilot and “something wasn’t right with him or the helicopter…given his landing maneuvers.”

A witness, who worked at the destination airport stated the helicopter flew toward her office from the runway, coming close to the picnic tables that were near the building where she worked. She stated that the helicopter was “real wobbly,” bounced off the ground, flew up quickly, made a tailspin in the opposite direction away from the office, and crashed.

Several witnesses reported seeing the pilot with a pill bottle in his hands following the accident. One of the witnesses reported seeing the pilot with two pills in his hand, but he did not see the pilot take them. One of the witnesses reported seeing the pilot toss the pills into the field, and another witness reported seeing pills falling out of the bottle. A witness who saw

the pilot throwing pills on the ground picked up two of the pills and gave them to law enforcement. The pills were later identified as acetaminophen and hydrocodone bitartrate 300mg/7.5mg.

Toxicology tests performed on blood and urine samples taken from the pilot at the hospital following the accident identified hydrocodone, acetaminophen, cyclobenzaprine, as well as several other drugs. Vicodin, which the pilot reported using, is a Schedule II controlled substance made from a combination of acetaminophen and hydrocodone. Hydrocodone may impair ones mental or physical abilities to perform activities such as driving a car or operating machinery. The level of hydrocodone in the pilot's blood when tested was within the range that novice users could expect to have side effects. Cyclobenzaprine is known to cause drowsiness and may also impair mental and/or physical abilities required to perform tasks such as operating machinery or driving a motor vehicle. The level of cyclobenzaprine in the pilot's blood was within the range that impairing effects are expected.

The pilot reported having obstructive sleep apnea and told healthcare providers he used a continuous positive airway pressure device for treatment. However, no information was available concerning his usage in the days before the accident. As a result, whether fatigue from inadequately treated sleep apnea contributed to the pilot's performance could not be determined.

The pilot had effective levels of two potentially impairing medications in his system when the accident occurred. When used in combination, the effects of such medications are greater than when each is used alone, although the exact effects have not been studied. In this case, the pilot's performance during the flight was not consistent with his level of skill and experience in the helicopter; it is likely effects from his use of a combination of impairing medications contributed to his degraded performance and his inability to safely land the helicopter.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's improper judgment to attempt a flight while impaired by medications, which resulted in the helicopter's abnormal ground contact, loss of control, and collision with terrain.

Findings

Personnel issues	Prescription medication - Pilot
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Landing	Abnormal runway contact (Defining event)
Landing	Attempted remediation/recovery
Landing	Loss of control in flight
Landing	Collision with terr/obj (non-CFIT)

On April 3, 2021, about 1630 eastern daylight time, a Robinson R66 helicopter, N577DD, was substantially damaged when it was involved in an accident in Palmyra, Pennsylvania. The pilot was seriously injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

On the day of the accident, the pilot had picked up the helicopter at Fredrick Municipal Airport (FDK), Fredrick, Maryland where an annual inspection had just been completed on the helicopter. The pilot then flew it to Double D Ranch Heliport (70PA), Mechanicsburg, Pennsylvania, to pick up a package that he wanted to deliver in the Hershey, Pennsylvania, area. He then flew direct to Reigle Field Airport (58N), Palmyra, Pennsylvania.

While en route he “picked up” the weather, and upon arriving at 58N, entered the traffic pattern for runway 31. His intended landing point was the grass area just to the east of runway 31.

According to the pilot, on touchdown, the helicopter was on a slight downhill slope. He felt a dynamic rollover starting, so he pulled up on the collective control stick and his right foot slipped off the right tail rotor control pedal and got stuck behind it. The helicopter entered a left turn from the low hover and impacted the ground.

According to a neighbor who lived in a subdivision near 70PA, before the accident flight, while working in his yard, the pilot “buzzed our rooftop and could not have been more than 20 feet above our house.” He also stated that the pilot then landed quite quickly in his (the pilot’s) back yard and was there for a short while before taking off towards the east. The neighbor further stated “to my knowledge he has never done this before. Something wasn’t right with him or the helicopter on Saturday given his landing maneuvers.”

According to a witness, who worked at 58N, during the helicopter’s approach for landing, the helicopter flew toward her office from the runway, closer than the witness had ever seen happen at the airport, and it was right next to the picnic table (which was close to the building she was in.). She stated that the helicopter was “really wobbly.” Then when it came down, it bounced gently off the ground, flew up rather quickly, and did a tailspin in the other direction away from the office and crashed.

According to another witness, who was riding in a vehicle at the time, he observed the nose of the helicopter go down, then the main rotor hit the ground and the helicopter instantly crash into the ground. His wife then pulled over the vehicle he was riding in, and he ran to the helicopter. When he arrived at the helicopter, he pulled open the door to the helicopter and started to assist the pilot in getting out. The pilot was disoriented and seemed to be in shock from the crash. He had to reach over him to unbuckle the seat belt that was holding him in, and then pulled him out of the cockpit and started to assess his wounds and asked him if he could stand. At this time, he noticed a gash on the pilot's forehead and a laceration on his right arm. He was able to help him to his feet and helped him reach into the cockpit to shut off parts of the running helicopter. The pilot seemed adamant about getting things out of the cockpit such as his cell phone, but the witness was concerned about getting everyone away from the helicopter, as there was smoke coming out of the engine compartment and he saw fuel leaking to the ground from the tail. The witness continued to talk to the pilot and explained that they needed to get away from the helicopter for safety reasons. After they got some distance away from the helicopter, he noticed that the pilot had a pill bottle in his hand which he opened, and then poured two pills into his hand, the witness did not see him take them. The witness and a police officer were able to walk him over to an ambulance that had arrived.

Two other witnesses also described the accident with similar details with one reporting that the pilot had pulled a bottle out and tossed the pills into the field and the other witness stating that he saw pills falling out of a pill bottle and he was not sure if the pilot meant to dump them or the lid came off. An additional witness also observed the pilot throwing pills on the ground and picked up two of them and gave them to a police officer. These pills bore the inscription "n352" and were later identified as acetaminophen and hydrocodone bitartrate 300mg/7.5mg.

Examination of the track log downloaded from a portable GPS unit that was onboard the helicopter showed a number of tracklog points which confirmed the route of flight of the helicopter. The last portion of the track data showed the helicopter's approach to 58N and the descent and turn toward the grass area. The data ended in the immediate vicinity of the accident location. Engine monitoring data in the timing region associated with the accident event, also showed marked increases in engine speed parameters for N1 (the low-speed spool) and N2 (the high-speed spool).

Examination of the wreckage revealed that it was substantially damaged but no preimpact failures or malfunctions of the helicopter or engine that would have precluded normal operation were discovered.

The 68-year-old male pilot had last applied for a medical certificate on May 9, 2015. At that time, he reported having had surgery for a broken pelvis, high cholesterol, and low testosterone. He reported using fenofibrate for his cholesterol and topical testosterone. These medications are not considered impairing. He also reported the intermittent use of an over-the-counter analgesic and methylprednisolone (an oral steroid medication) for reasons

that were not specified. No significant abnormalities were identified, and he was issued a third-class medical certificate without limitations.

This medical certificate had expired for all classes of operation as of May 31, 2017. The pilot had applied for and completed the requirement of BasicMed as of November 15, 2019.

Records from the pilot's admission to a trauma center following the accident were reviewed. During his hospitalization, the pilot reported having arthritis with chronic low back pain, obstructive sleep apnea treated with use of a continuous positive airway pressure device, high blood pressure, high cholesterol, a previous pulmonary embolism (2017), and chronic kidney disease. The pilot reported using the following medications: Vicodin (a combination of acetaminophen and hydrocodone), apixaban, fenofibrate, nasal fluticasone, and hydrochlorothiazide. A clinical urine drug screen identified opiates.

A search of the Pennsylvania Prescription Drug Monitoring Program database, which contained information on all controlled substance prescriptions filled at a dispensary within the state, did not reveal a record of him having a prescription for Vicodin.

Toxicology tests performed by the FAA's Forensic Sciences Laboratory on leftover blood and urine specimens obtained by the hospital when the pilot arrived, identified hydrocodone (38 ng/ml in blood) and its active metabolites dihydrocodeine and hydromorphone in blood and urine; cyclobenzaprine (24 ng/ml in blood) and its metabolite norcyclobenzaprine in blood and urine; as well as metoprolol, naproxen, ibuprofen, and acetaminophen in blood and urine.

Vicodin, which is a combination of acetaminophen and hydrocodone, is a Schedule II controlled substance. Hydrocodone is an opioid and carries a significant risk of addiction, abuse, or misuse. It also carries this warning, "may impair the mental or physical abilities needed to perform potentially hazardous activities such as driving a car or operating machinery. Warn patients not to drive or operate dangerous machinery unless they are tolerant to its effects and know how they will react to the medication." Blood levels where novice users would expect to have effects are between 10 and 50 ng/ml. The pilot's hydrocodone blood level when tested was 38 ng/ml. Acetaminophen is an analgesic, often marketed by itself with the name Tylenol. Alone, it is not considered impairing.

Cyclobenzaprine is a prescription medication that acts in the brain to relieve muscle spasm. It is well known to cause significant drowsiness and carries this warning, "especially when used with alcohol or other central nervous system depressants, may impair mental and/or physical abilities required for performance of hazardous tasks, such as operating machinery or driving a motor vehicle." Effects are expected when blood levels are between 5 and 40 ng/ml. The pilot's cyclobenzaprine blood level when tested was 24 ng/ml.

Pilot Information

Certificate:	Private	**Age:**	68,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	BasicMed	**Last FAA Medical Exam:**	November 15, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 7, 2019
Flight Time:	763 hours (Total, all aircraft), 400 hours (Total, this make and model), 700 hours (Pilot In Command, all aircraft), 1.5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	ROBINSON HELICOPTER CO	**Registration:**	N577DD
Model/Series:	R66	**Aircraft Category:**	Helicopter
Year of Manufacture:	2015	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	0675
Landing Gear Type:	Skid	**Seats:**	5
Date/Type of Last Inspection:	March 24, 2021 Annual	**Certified Max Gross Wt.:**	2700 lbs
Time Since Last Inspection:	1 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	463.5 Hrs as of last inspection	**Engine Manufacturer:**	Rolls-Royce
ELT:	Not installed	**Engine Model/Series:**	250-C300/A1
Registered Owner:	DONAGAIR	**Rated Power:**	270 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KMDT,312 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	16:56 Local	**Direction from Accident Site:**	239°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 22000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	300°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.25 inches Hg	**Temperature/Dew Point:**	12°C / -11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Mechanicsburg, PA (70PA)	**Type of Flight Plan Filed:**	None
Destination:	Palmyra, PA (58N)	**Type of Clearance:**	None
Departure Time:	16:13 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	REIGLE FLD 58N	**Runway Surface Type:**	Grass/turf
Airport Elevation:	489 ft msl	**Runway Surface Condition:**	Dry;Vegetation
Runway Used:	31	**IFR Approach:**	None
Runway Length/Width:	0 ft / 0 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	40.286767,-76.576988(est)

Administrative Information

Investigator In Charge (IIC):	Gunther, Todd
Additional Participating Persons:	William Gossley; FAA / FSDO; Harrisburg, PA
Original Publish Date:	May 3, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=102861