

Mercy One: Lifesaving care for the people of Iowa

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With two bases located in and around Des Moines, Iowa, Mercy One's Bell 429s are a common sight in the skies above the city and outlying areas.



Mercy One works with many local fire and police departments in Iowa and the surrounding states. Skip Robinson Photo

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The hospital-based program started in November 1986 under the name Mercy Air Life. It has been an Air Methods program since the beginning, with Air Methods providing pilots and mechanics, and MercyOne Medical Center supplying the medical crews. Mercy Air Life initially flew a twin-engine Bell 222UT, making it the first instrument flight rules (IFR)-capable helicopter emergency medical services (HEMS) program in Iowa.

In late 2002, the program changed its name to Mercy One while continuing to fly the Bell 222UT. The aircraft was fast and had long legs, and the flight crews enjoyed the cabin space and smooth rotor system.

However, after the Bell 429 hit the market in 2009, Mercy One retired the 222 and moved to the 429, becoming the first EMS operator of the type. The 429 sported the newest avionics technology, more fuel-efficient engines, an extremely smooth rotor system, and a large and comfortable cabin for the flight crews. The rear clamshell patient loading doors were also a great feature for the EMS mission.



The program likes the Bell 429's speed, modern avionics, smoothness, and its cabin size.

"I came from U.S. Navy HH-60Hs, an incredibly capable aircraft in its own right [see p.26], but the Bell 429 is like flying a very refined car: smooth, quiet, stable, reliable, and well made," commented pilot Kit Brown. "It cruises at 140 knots without trouble and has

plenty of power for our mission profile. . . . It's a terrific helicopter and although none are perfect, it's a great choice for our program."

Mercy One's original base is located at Mercy Medical Center in downtown Des Moines. In November 2010, a second base was opened at Knoxville Iowa Airport using a Bell 407. The 407 was a good machine, but in 2012, with its first Bell 429 proving to be very capable, Air Methods purchased a second 429 in order to standardize the Mercy One fleet.

Iowa has very warm and humid summers, with the potential for thunderstorms and even tornado events. According to Brown, "We don't have high mountains in our area, but the summer temperatures can affect helicopter performance. We are fortunate that the Bell 429 is a strong aircraft and we rarely have an issue with flying at near gross weight. We range out to 150 miles and our fuel load can accommodate that."



Mercy One operates two Bell 429s. It became the first EMS operator of the type in 2009, and received its second aircraft in 2012.

Meanwhile, he said, winters in Iowa can be brutally cold. "We fly the helicopter successfully near the operating temperature limits of the helicopter, as we see -20 F [-29 C] in the winter and 105 F [41 C] in the summer. With power to spare, Mercy One's 429s are equipped with air conditioning and robust heat, not for creature comfort but out of necessity for patient care.

“Winter snow storms are a common occurrence in Iowa, and the winter weather can prove to be life-threatening for the crew and patient on scene,” he continued. “As we do in the summer, we remain in constant communication on the ground and in the air with our own MercyOne dispatchers, who keep us apprised of impending weather. We always carry extra warm weather gear, cold weather survival equipment, and are prepared if we need to land at an outlying airport.”

Approximately 20 percent of Mercy One’s flights are scene flights, while the remaining 80 percent are interfacility transfers. Because of the extensive ranching and farming activities in the rural areas surrounding Des Moines, Mercy One is commonly tasked with responding to accidents involving people thrown from horses or crushed by livestock. Accidents involving heavy farm equipment are also common, and can result in crush injuries, burns, and amputations. The helicopters may also fly to farms and ranches to respond to heart attacks, strokes, and other time-sensitive medical emergencies.



Mercy One’s pilots said they enjoy the Bell 429 and its sophisticated avionics. Skip Robinson Photo

Motor vehicle accidents are common throughout Mercy One’s operating area. During the long days of summer, the program may be called to respond to drowning events or boating accidents on Iowa’s lakes and rivers. Mercy One also receives occasional requests from local and state law enforcement agencies for assistance in searching for missing persons that may need medical assistance.

A dedicated team

According to Mercy One manager of flight services Dennis Cochran, the program continues to contract with Air Methods for aircraft, pilots, and maintenance services, with eight pilots and four mechanics covering both bases. Meanwhile, 20 flight nurses and seven flight paramedics employed by MercyOne Medical Center constitute the adult transport team, with another eight pediatric and 11 neonatal nurses available for transports of younger patients.

“The Mercy One flight team consists of registered nurses and critical care paramedics experienced in trauma, cardiac, and critical care,” Cochran explained. “A specialized pediatric transport team was established in 2014 for ground and air transport. We also have a specialized neonatal transport team available for ground and air transport.”



The aircraft's large cabin allows the program to easily carry a pediatric isolette and multiple crewmembers.

Mercy One also carries sophisticated equipment including an intra-aortic balloon pump and an Impella heart pump. In 2017, blood products were added onboard the helicopters during all transports.

According to flight nurse Mackenzie Udelhoven, “Flying with Mercy One is my biggest personal accomplishment to date. I’m spoiled flying in our Bell 429; the speed and space afforded by the [429] allows us to deliver the ultimate in care to our patients.”

Udelhoven noted that the aircraft's spacious cabin can accommodate not only the medical crew, patient, and all necessary medical equipment, but also a family member, giving them "the ability to fly along with their loved one during what invariably is one of the worst days of their lives." Mercy One also sometimes installs an extra seat in the cabin for a third medical professional or a new crewmember undergoing orientation.



About 20 percent of Mercy One's flights are to respond to scene calls. The remainder are interfacility transfers.

"The [429] gives us the ability to have very quick takeoff and shutdown times, which has proven to make the difference in patients' vitality," she added.

Flight nurse Shelly Ouverson, who is on Mercy One's pediatric transport team, also praised the 429's expansive cabin and fast, smooth profile in cruise flight.

"The Bell 429 has greatly enhanced our capability during pediatric transports as it allows for multiple crewmembers to ride along to assist our young patients," she said. "When taking care of critically ill children it is imperative to have the ability to move comfortably. Having extra room may also permit a parent to fly, which is obviously good for both the child and parent. We also like the speed of the 429, which allows us to get to the receiving hospital quickly. Something that is known by people who fly on them, the 429

is smooth! This helps our babies, parents, and us in the back. We can do procedures easier, focus better, and it's much less fatiguing than a higher vibration aircraft.”



Current expansion plans have the program adding three more Bell 429s (one of which will serve as a spare) by early next year, at which point it will become the largest operator of the model in the U.S. Skip Robinson Photo

Mercy One has its own dispatch communications center staffed around the clock, employing 14 communications specialists. The dispatchers are trained in the basics of Federal Aviation Administration (FAA) rules and weather criteria, as well as crew resource management. Twice daily, the crews brief with the dispatchers regarding any weather limitations or flight concerns for the day. Working for Mercy One, the aviation dispatchers are focused on the safety of flight operations of the program's helicopters, and constantly working to ensure expeditious and safe patient transfers.

The dispatchers remain in communication with law enforcement and local hospitals during the flight, relaying any change in patient status. Likewise, Mercy One dispatchers provide medical updates to the MercyOne hospital emergency room and intensive care unit (ICU) staff while en route. If and when a flight must be diverted, the dispatchers are crucial in assisting the pilot with arranging fuel and ground services, as well as coordinating patient care with a ground facility.

Enhanced capabilities

Mercy One has been an active IFR program since its inception in 1986 and makes consistent use of the IFR system to meet customer demand. Shortly after the program's

first Bell 429, N911ED, entered service in 2010, Mercy One took advantage of the aircraft's WAAS localizer performance with vertical guidance (LPV) capability by adding five point-in-space approaches around central Iowa. These non-part 97 procedures allow direct IFR operations to and from the program's flagship hospital in Des Moines, along with three key customer hospitals and one prominent scene location near Interstate 80 in Stuart, Iowa, west of the Des Moines metro area.



Night vision goggles have made EMS operators safer, and Mercy One uses them on a regular basis.

The procedures, designed by Hickok and Associates and funded by Bell Helicopter, form the vertices of a low altitude IFR network centered around Des Moines, offering LPV approach minima of 300 feet and $\frac{3}{4}$ mile. Expedited IFR handling by Des Moines TRACON is codified in a letter of agreement and facilitated by an especially strong relationship between program pilots and controllers. Mercy One has averaged over 100 IFR patient transports annually since its IFR network was put in place.

According to Mercy One pilot Joe Wahlig, the 429 offers excellent IFR performance thanks to its highly versatile glass cockpit and dual redundant four-axis automatic flight control system (AFCS). With a 1,000-foot-per-minute cruise climb at 110 knots true airspeed (KTAS), the aircraft wastes no time reaching Mercy One's IFR en route altitudes (typically 4,000 to 7,000 feet mean sea level). Once at altitude, it offers an honest 145 KTAS while burning about 530 pounds (240 kilograms) of fuel per hour.

The vast majority of Mercy One's IFR patient transports are less than 150 nautical miles in total distance, and with plentiful nearby alternates, part 135 IFR fuel planning requirements can normally be met within the aircraft's 7,000-lb. (3,175-kg) maximum gross weight limitation. However, this weight limit often necessitates tradeoffs. To optimize range versus payload, the program utilizes a system to rapidly reconfigure carry-on medical equipment to meet patient requirements while minimizing cabin loading.



The clamshell rear doors allow for easy access to the cabin.

In March 2019, Mercy One's health network announced plans to expand its contract with Air Methods. Under the agreement, Air Methods will provide two Bell 429s to Mercy One health network hospitals in Sioux City and Mason City, Iowa, as well as a fifth Bell 429 to serve as a spare aircraft for the four bases. The expansion is expected to be complete by the first quarter of 2020, at which point the program will be the single largest operator of the 429 in the United States.

To accompany this expansion, Mercy One added two new, proprietary non-part 97 instrument approaches from Hickok and Associates. These will serve two rural hospitals near the Iowa-Missouri border that do not have nearby airports and so would otherwise not permit service to the area in IFR conditions. The surveys have already been completed and are awaiting final approval from the FAA.

For 33 years, Mercy One has provided continuous service to the City of Des Moines, the state of Iowa, and the surrounding areas. With this latest expansion, the program is poised to continue its lifesaving missions for many years to come.

