A day in the life of a Sanford AirMed helicopter pilot

Depending on which of our four Rotor Wing bases a Sanford AirMed helicopter pilot is located at, the pilot’s shift begins at 7 a.m. or 7 p.m. Like most people who clock into work, our pilots sign-in to a computer system — but this system tracks hours worked, hours flown and rest periods to meet FAA regulations on pilot duty and flight time. The FAA rules prohibit our pilots from being on duty more than 14 hours and/or flying more than eight hours in a 24-hour period. A pilot reaching either of those thresholds is called ‘timed-out’ and has to have a specified rest period before returning to duty.

After signing in, pilots speak with the pilot going off duty. At this shift change briefing, the pilots discuss what occurred during the previous 12-hour shift, flights that were done, any anticipated or public relations flights scheduled, weather and the aircraft itself — if there were any issues or upcoming maintenance.

After the briefing, the pilot will do another weather check and read maintenance data to see if there are any inspections scheduled. The pilot has a conversation with the mechanic on duty to confirm what the pilot ascertained about aircraft maintenance. Pilots and mechanics have to work closely to ensure that we don’t ‘overfly’ or miss an inspection.

The pilot is responsible for ensuring the aircraft is safe to fly, so they do a flight inspection on every shift. Pilots follow a checklist provided by the aircraft manufacturer, inspecting the aircraft from nose to tail-rotor and blades to skids to make sure nothing compromises the safety of the flight.

After aircraft inspection, the pilot speaks with the medical team members for the day. This shift briefing ensures all team members know what to expect for the day in the areas of: maintenance, weather, PR flights, safety and any other issues that will or could take place during the shift. Every shift briefing includes review of a training topic as well as an aircraft emergency procedure. An important part of flying is crew resource management and discussing these topics each shift fosters good working relationships between pilots and medical teams.

Though pilots have their own routines during the day, they complete a number of tasks in common, including:

• Routinely checking weather
• Reviewing the aircraft flight manual
• Staying nourished and hydrated
• Resting
• Always staying prepared for the next flight

Pilots have to be prepared for many variables during a shift. A pilot can fly all shift long, or not at all. A full shift worth of flights could end up crammed into half of a shift. With weather always changing, one leg of a flight could be completed under visual flight rules with the next leg of the flight being made in the clouds and under instrument flight rules. A patient may need specialized care at a hospital outside of our normal flight area. Pilots frequently have to start preparing for their next flight while still on
their current one, after getting a request for a new flight while still en route to the hospital with our current patient. Everything has to be done while following FAA rules and regulations and Sanford AirMed policies, whether the shift has us landing at a scene in a field, parking lot, road, elevated or rooftop hospital helipad or airport.

Though a pilot’s day is often far from typical, one thing that never changes at Sanford AirMed is our pilot’s safety ethic. The safety of our patients, teams and aircraft are always our top priority.

Matthew Horn  
Rotor Wing Chief Pilot

**Fargo NICU team**

Though the name has changed over the years, the AirMed Fargo NICU team has been serving for decades with safe care always our top priority. The team composition has evolved along with the name to currently include: advanced practice providers, certified registered nurses and specially trained children’s respiratory therapists. We are a close-knit, high-functioning team working toward the ultimate goal: providing top of the line neonatal critical care on the go, stabilizing and transferring the baby safely.

Our team utilizes protocols developed in collaboration with the children's hospital educators and the medical director. With supporting certification from The Commission on Accreditation of Medical Transport Systems, the team complies with AirMed policies and safety training and maintains a set of skills including:

- Endotracheal intubation
- Umbilical line placement
- Chest tube insertion

All team members are BLS and NRP certified and certified in specific transport training courses.

Team members are also certified in Basic STABLE and Cardiac STABLE and the team upholds the practices taught in the STABLE program:

- Sugar and safe care
- Temperature
- Airway
- Blood pressure
- Lab work
- Emotional support

Once we get to a referral facility, we have the equipment, medications and knowledge required to care for and stabilize the baby as we would in our home unit. If you’ve heard the term, ‘Swoop and Scoop,’ that’s not what we do. We carry a portable lab to analyze the baby’s blood gasses, electrolyte balance and blood sugar. Our pumps, ventilators and isolette incubators are able to support the tiniest micro preemie to a full-term baby. We have the ability to use nitric oxide therapy on transport and utilize passive cooling on suspected hypoxic ischemic encephalopathy patients, often with the referring facility assisting in starting the process before we arrive. We welcome questions and take pride in being a resource for our referral facilities, which might not be as familiar with our neonatal patient populations.

We are mission-ready, 24 hours a day, 7 days a week!

Tara Heidrich  
Registered Respiratory Therapist
AirMed 6 to move into new hospital

If you’ve driven into Fargo lately it’s hard not to notice the massive construction project and building in the southwest part of the city. One of the top health care projects in the United States, the new $494 million Sanford Medical Center Fargo sits on 110 acres and will open for patients in July 2017. The SMC Fargo building is 11 stories high with 1 million square feet of floor space and features 380 beds, 50 emergency department bays and 36 operating rooms. AirMed 6, the Fargo-based helicopter, will relocate to the new facility in early May of 2017.

Sanford Medical Center Fargo has been a Level II Adult Trauma Center for decades and is working towards a Level I designation. This designation, along with being the region’s only Level II Pediatric Trauma Center, will result in additional ambulances and helicopters bringing patients to the new facility. Two helipads have been constructed in anticipation of increased helicopter traffic — one on top of the ambulance garage and one on the ground just north of the ambulance garage. Routine traffic will land on the rooftop pad, but in times of mass casualty events, or if a large military helicopter needs to land at the hospital, the ground pad will be utilized.

The helipad will also have an FAA-approved instrument approach, enabling instrument-qualified helicopters to safely land and take off during low-visibility weather and adding to the number of flight requests AirMed6 can accept to better serve patients in our region. We are very excited to move into this state-of-the-art facility. We will begin training staff next spring to deliver a flawless experience to our patients and visitors when this premier facility opens.

Tim Meyer  
Sanford AirMed Enterprise Clinical Director

Commitment to safety

Whether knowing or unknowingly, some companies can perform unsafe acts and be accident or incident-free for some time, developing a mindset that ‘it can’t happen to us.’

For some, with the focus elsewhere, this mentality might mean that there is little incentive to be safe.

To be safe, we must commit to a process made up of several components: motivation, safety culture and utilization of resources.

• Motivation. Is an organization satisfied with training or operating at minimum standards or is it committed to be the best in the industry?
• Safety culture. From leadership to front line staff, a positive safety culture involves everyone. All members of an organization are on the same team and their commitment to working together should be in an atmosphere of trust and respect. A safety culture must be informed, flexible, willing to learn and dedicated to the Safety Management System processes.
• Utilization of resources. There is more than checklists, protocols and other procedures. As I continue to develop AirMed’s Crew Risk Resource Management (CR2M) education, I am reminded both by my research and from fellow safety professionals that CR2M means using all available resources. We use each other, outside sources and any other item available to us in that moment to reduce the risk to acceptable levels.

Safety does not come without cost and neither does the result of an accident. We must stay vigilant, aware of our surroundings and understand that ‘it can happen to us.’ The outcome depends on our level of commitment to being the best.

Stay safe.

Josh Weiland  
AirMed Safety
Employee of the year awards

Sanford AirMed employees are asked each year to nominate a paramedic, nurse and aviation staff member as employee of the year. The award nominees are considered and chosen accordingly by management. The staff members honored show dedication to the program, consistently sustain safety standards around the aircrafts, maintain education requirements and have excellent personal skills and attitudes throughout their shifts.

The employees of the year are:

**Sioux Falls:**
- Kim Niemann — Nurse
- James Smidt — Paramedic
- Gary Dykstra — Aviation
- Thom Brude — Communications center
- Cheryl Stansbury — Communications center
- Sara Oakland — Pediatric specialty team

**Fargo:**
- Kasey Larson — Paramedic
- Jenny Amundson — Nurse
- Chad Erickson — Aviation
- Kristi Topp RRT — Specialty team

**Bemidji:**
- Bryan Johnson — Paramedic
- Brian Ecker — Nurse
- Gary Motz — Aviation

**Bismarck:**
- Matthew Kann — Paramedic
- Kristin Vetter — Nurse
- Stephen Brousseau — Aviation

**Dickinson:**
- Kelly Dollinger — Paramedic
- Randi Stockwell — Nurse
- Chris Susie — Aviation
Heart failure

The heart is an amazing 10-ounce pump. With each beat, approximately 2.5 ounces of blood is pumped into the circulatory system. With an average heart rate of 72 beats per minute, 1.3 gallons of blood are pumped every 60 seconds. Start doing the math and eventually you arrive at a total of 68 Olympic-sized swimming pools filled over the lifetime of a person at the age of 70.

With a job that big, it’s no wonder as we live longer, our heart simply begins to give out. Symptoms of heart failure begin as it fails to pump as well as it should. Fluid backs up into the lungs causing congestive heart failure. Close to 5 million Americans have CHF with more than 400,000 new cases diagnosed each year. After the age of 40, you have a 20 percent risk of developing CHF before you die and risk factors such as high blood pressure, diabetes, smoking and heart disease increase your likelihood of developing CHF as much as 500 percent (Roth, 2016).

CHF is the most common primary or secondary diagnoses for all people admitted to the hospital at age 65 and over. One-third of those diagnosed with CHF who are discharged die within the year. The health care system feels a dramatic financial impact of CHF. The Centers for Medicare and Medicaid Services has identified that re-admittance to the hospital within 30 days will not be reimbursed. If 30 to 40 percent of patients are readmitted within six months, hospitals are burdened by using available resources to educate and treat CHF outside the hospital walls, if possible. It has been determined that 40 percent of the above re-admissions could have been prevented by identification of triggers and education of patients about self-care and recognizing exacerbation of CHF symptoms.

A particular cause of CHF is dilated cardiomyopathy (DCM), the most common form of cardiomyopathy and representing the largest group of heart failure cases (2Bott-Silverman, 2009).

DCM has a wide variety of causes, with the most common being ischemic cardiomyopathy resulting from damage to the myocardium — the thick middle muscle layer of the heart composed of cardiac muscle and responsible for contraction and relaxation. Ischemic DCM is responsible for approximately 60 percent of the patients with symptoms of heart disease. No matter the DCM cause, the result is a damaged myocardium and myocardial scarring or fibrosis, leading to a less and less efficient pump. A less effective pumping capacity results in dilation of the chambers. A vicious cycle develops as the heart tries to do the same amount of work with less ability. Known as ventricular remodeling, medicine aims to slow down or stop this process in order to preserve the myocardium and lessen the damage to the left ventricle. The harder the ventricle has to work, the thicker and more dilated it gets, resulting in valvular dysfunction and, at times, compensatory valve regurgitation. As each chamber deals with increased blood volume due to decreasing contractility and leaky valves, they become more dilated and symptoms of failure eventually surface.

Clinically, the symptoms are directly related to the severity of the disease process and generally develop over time. Low cardiac output symptoms demonstrate as shortness of breath, dyspnea on exertion and orthopnea due to a backup of fluid in the lungs. Like a rubber band, stretching before it breaks, the heart can also stretch, compensating until some precipitating factor or event causes it to fail.

In this scenario, where does EMS come into play?

As patients are forced to self-manage their disease, they are educated to watch closely for signs of a flare up or exacerbation of CHF. Weight and fluid intake are monitored and sodium is managed. Careful control

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of hypertension and management of weight is emphasized throughout hospitalization and follow-up clinical visits. Also, part of the education process is responsibility for medication management and self-medicating. When these management tasks fail, or when the patient suffers another precipitating event like an ischemic event or hypertensive emergency, the symptoms of failure become pronounced and may overwhelm an already sick heart.

For many, the next call is to 911 after a sudden onset of shortness of breath caused by exacerbation of CHF due to dilated cardiomyopathy. Physical examination can vary depending on the severity of the disease and at what point EMS is notified. Patients are usually alert depending on the level of cerebral perfusion that is affected. It is important to question the patient on their activity level on a normal basis. Those having symptoms with minimal activity are more seriously ill than those participating in activities on a regular basis. In the later stages of the disease process, the skin may be cool and pale and cyanosis may be present. Irregularity may be noted when palpating a pulse. As sick hearts are more susceptible to atrial fibrillation, rate irregularities may be noted. This alone may be the precipitating factor in the sudden development of heart failure symptoms when the patient thought everything was going well. Loss of atrial kick in a patient who is dependent on atrial contraction for cardiac output is a common cause of sudden onset of failure.

Pulsus alternans is also a detectable irregularity due to the alternation between strong and weak beats in the pulse assessment. Resting tachycardia is not unusual as the heart rate rises in an attempt to compensate for decreased stroke volume. Blood pressure may be low with a narrowed pulse pressure and patients may experience orthostatic hypotension, or demonstrate uncontrolled hypertension — defined as a diastolic blood pressure of 105 mmHG or more.

More than 40 percent of patients with hospital readmission demonstrate hypertensive blood pressure symptoms. Murmurs may be auscultated as a result of mitral and tricuspid regurgitation and lung sounds will demonstrate crackles bilaterally. Peripheral edema and jugular venous distention may be demonstrated with a patient at a 45-degree angle (semi-fowlers) as a result of liver distention and engorgement from right-sided failure. Generally, medical therapy is aimed at reduction of mortality and symptom relief. Medicines prescribed are for the reduction of preload, reduction in afterload and improvement in contractility.

Preload reduction is accomplished in part with prescribed diuretics like Lasix or Spironolactone, decreasing extracellular fluid volume and allowing the left ventricle to become less dilated. These also facilitate a more effective valve action. Patients are often instructed to increase their Lasix dosage in lieu of noted weight gain of greater than three to five pounds in three to five days. With weight gain often times preceding other symptoms, the hope is intervening sooner to prevent the need for hospitalization for more severe symptoms. Patients are encouraged to be proactive in managing their symptoms.

Nitrates also work to decrease preload by dilating the veins, allowing more blood to remain in the vascular system. Afterload reduction is achieved through the use of ACE inhibitors acting to block the neurohormonal response occurring when the body perceives lowered volumes as a sign of dehydration. Studies support the use of ACE inhibitors in all patients with an ejection fraction of less than 40 percent to decrease long-term mortality (Jessup et. al, 2004).
EMS can be involved in a different capacity — such as trauma from a fall at home — as these therapies themselves can lead to problems with: hypotension, dizziness and syncope. It is imperative as a health care provider to determine medication compliance.

Education is diligently provided to patients with heart failure, making it very important to question them regarding:

- Current weight and any weight fluctuations
- Recent salt intake
- Emotional stressors
- Recent illnesses
- Other health symptoms that may have precipitated an event

Patient treatment at the scene will be within the protocols of your own system, but a general principle includes providing oxygen, nitrates, diuretics and pain medication to reduce anxiety. It is also important to maintain adequate perfusion pressure. As ischemic heart disease is prevalent in these patients, take care not to overlook acute coronary syndromes as a precipitating factor in exacerbating the symptoms of heart failure. A must in the acute treatment of heart failure patients is the 12-Lead ECG.

More advanced treatment of heart failure patients involves incorporating synchronous therapies (dual chamber pacemakers) and ICD’s (internal cardiac defibrillators) in younger patients and earlier in the disease process. To decrease the load on the heart, most EMS systems use a series of treatments and medications and the use of CPAP can help push fluids out of the lungs in more severe flare-ups.

All of these treatments are good, and in most cases life-saving, but EMS also has the potential to provide support and monitoring to patients with CHF and education to help prevent future hospitalizations.

The health care system is stressed. Education in the hospital is often times rushed and in-patient stays are becoming shorter and shorter. In smaller communities, consider ‘adopting’ local heart failure patients and offering outreach in the form of blood pressure screenings and weight checks as well as encouraging local education events and support groups.


Suzan Buetow
Registered Nurse, CCRN

To request training or sign up for an upcoming training event, email sanford.airmed@sanfordhealth.org.