As a fledgling student pilot at Fort Wolters, Texas, in 1969, I can remember the apprehension that all my fellow students and I had going out on our first night cross-country solos. Extensive precautions were taken before we went flying into the pitch-blackness of the north Texas sky. We received several hours of traffic pattern work with a veteran instructor pilot at night and extensive briefings about night blind spots, photokinesis, diet, circadian rhythms, sky scanning, and fatigue. Before pulling pitch, we spent about 30 minutes getting acclimated to the dark in a room dimly lit with red light, and we used red-lens flashlights for map reading and all preflight preparations.

I wondered recently why we aren’t so careful anymore. Did our eyes get better, or are we just bolder and less careful than in those days?

During most of my military career flying medevac missions, we continued to take extensive precautions as we prepared for and performed wartime and peacetime night operations in our old dependable Hueys with little token searchlights. We landed to Zippo lighters and flashlights as we plodded through pitch-black skies often compounded by atrocious weather. We lost lots of fellow medevac pilots and crews to the night skies. Again, I recently wondered if we have forgotten some of those early precautions and lessons and whether the pressure to be a 24/7/365 service has blinded us to some very serious risks. Today we continue to lose our friends to the night skies and somehow wonder why.

The late Michelle North and many other emergency medical services (EMS) aviation safety advocates, including me, have been agonizing over climbing EMS accident rates and pushing hard to stop the incredible rash of preventable accidents that we have observed in recent years. When Michelle and I would chat shortly after each tragic EMS accident, we would look for common threads, often exclaiming the same phrase time after time, “What the hell was he doing out there?”

She and I had been working together on innumerable committees, special projects, and surveys for over 10 years, and our frustrations were reaching a palatable level. I am proud to have known such an energetic, passionate, and courageous lady, and I am proud to have battled side by side with her for so many years. Her passion for aviation safety and her friendship will be sorely missed.

Michelle and I came to one common theory in recent years: dark air.

We have known since man and woman walked on this earth for the first time that getting something done safely at night was a challenge, at best. Current scientific research validates what we have known for centuries: someone with 20/20 vision during the day has relative visual acuity of 20/200 when operating at night. That should be no surprise to anyone who has had to conduct any critical night operations unaided. Somehow in EMS aviation, perhaps as a result of our “rescuer” mentality and other external or internal pressures, operators and programs continue to underestimate the risks associated with night EMS rotor-wing operations.

An overwhelming majority of the fatal EMS accidents in the past 7 years have occurred at night. Some of them have had adverse weather thrown into the mix. Many of them are controlled flight into terrain; in my view they were all preventable if the pilot simply could have seen and avoided the hazard. This should be a statistic that no one can ignore.

The hazards associated with night EMS operations are truly an elephant in the road that we have been walking around for years. Risk management actions can be taken to improve your odds. If you want to gamble, go to Vegas; if you want to practice sound risk management, follow some of my recommendations below.

Ceiling and Visibility Minimums

Ensure that minimums are adjusted for your local flying area. In my view, Federal Aviation Administration and Commission on Accreditation of Medical Transport Systems minimums are just that—minimums for the most ideal conditions with very experienced, locally familiar flight crews. If the terrain varies significantly throughout your flying area, weather reporting is sparse, or you have a mix of rural and urban population areas, I recommend that minimums be adjusted upward to reflect the associated higher risks. I know of several programs in mountainous or very rural areas that have raised night cross-country minimums to 2000-5. That sort of conservative response seems to be smart risk management.

Night Vision Devices (NVDs)

The most obvious improvement to risk management, particularly for night scene calls and visual flight rules cross-country flying, is the use of NVDs. Having experienced firsthand the art of landing in black landing zones with or without NVDs, there is no contest. I shudder when I consider how many times I had to use some sort of sixth sense or faith
that I was visualizing everything I needed to see on night scene calls unaided in the past.

Anyone dragging his or her feet about acquiring NVDs at a program cannot be aware of the enormous value and safety margin they provide. Most pilots coming from the military today are simply incredulous when they learn that the EMS community has been (and still is) performing unaided night operations at such high risk for so long. Most of the bureaucratic barriers appear to be overcome as of this writing, and the only things standing in the way of any program are money, time, and will.

As with any technology or operation, many hazards are associated with NVD flight that must be carefully managed. It is not a panacea to all of our night safety issues; it is simply another tool in our toolbox that still requires sound aircrew decision making and good judgment.

**Instrument Flight Rules (IFR)**

Assuming a program neither is ready nor has the resources to commit to an NVD operation, other tools are available to improve management of night risks. IFR flight is ideal for interfacility transfers and scene response near airports or helipads with global positioning system (GPS) approaches. For programs with IFR capability, the risks inherent in inadvertent instrument meteorological conditions (IIMC) are reduced. Programs that have point-in-space GPS approaches and routes can fly cross-country under more controlled and safer IFR conditions rather than “scud run” under marginal weather to and from their calls, a practice that continually ends up on the Concern Network and National Transportation Safety Board (NTSB) files.

**Other**

Programs that are unwilling or unable to see the value in either NVD or IFR flight should improve, at a minimum, standard lighting systems on any aircraft, especially some of the entry-level “starter” aircraft often used for EMS. Searchlight systems that provide 15 to 30 million candlepower are available for most aircraft, and optional skid or wheel lighting vastly improves visibility on high reconnaissance and final approach.

If you spend any time flying over or landing in dark terrain, you must significantly work to improve your odds. It should be noted, however, that many of the recent accidents involved sophisticated aircraft with fancy equipment and veteran pilots. Several avionics manufacturers offer terrain avoidance or warning systems and add-on software to current GPS units that depict or warn of upcoming high terrain. These can be a useful complement to sound navigation and good old-fashioned terrain interpretation. Several satellite-based communications and flight-following systems can enhance safety as well. The standard radar altimeter is an absolute necessity for night flight in our environment.

Again, all of these devices are simply tools to complement good piloting and decision making. They do not make up for good judgment and a well-trained pilot and crew.
Training

Often, training is touted as a solution to all evils in EMS aviation. I am a firm believer that quality and meaningful training is part of the equation but not, in itself, the answer. Training and high-quality equipment are useless unless there is a vendor, program, and personal value system that fully embraces sound aeronautical decision making and a conservative safety culture.

Training, if it is to be valuable, must be comprehensive, mission oriented, and continually evaluated for its effectiveness. I can recall that my night “training” for one EMS program consisted of 3 landings and takeoffs at a nearby airport with an instructor pilot. I then was signed off to go into the wild surrounding hills and pluck patients from anywhere in our area.

The most valuable training I have experienced involved local EMS agencies and public safety agencies in concert with day and night training. This interaction provided great value to all concerned. These agencies set up landing zones in their rural or urban surroundings just like the real world, and the program or vendor instructor flew real-world scenarios with a new pilot and ground units. The training was not time oriented but performance oriented. When everyone got it right, the training was successful. Another significant part of the training was IIMC training in the same areas that might be encountered on real patient flights. Some pilots discovered firsthand that IIMC in narrow canyons would not be survivable. Punching into a cloud deck or fog bank while climbing out from a dark landing zone is a lesson better learned on the practice field. Valuable lessons are always better experienced in a controlled training environment.

Crew resource management—now introduced to the EMS community as air medical resource management (AMRM) (with a great deal of credit going to Michelle North)—can be an important risk-management tool for EMS operations. Using all available resources and including the medical crew in the decision-making process adds extra eyes, ears, judgment, and other senses to the pilot’s ultimate responsibility to conduct a safe flight.

On too many of these recent accidents, Michelle and I used to wonder out loud what the crew was doing or not verbalizing before or while the aircraft flew into that terrain or poor weather on a dark night. Did they know and use company minimums? Were they well below minimums and did not speak up? Were they aware that conditions were becoming uncertain or that they were on a perilous course? Did that crew or the program’s safety values or competitiveness tacitly encourage risk taking? Did they consider themselves to be heroic and believe that some risk taking was OK? Could the pilot maintain visual surface reference?

These questions usually go unanswered in the NTSB findings. All we can do as crewmembers, vendors, programs, and pilots is take a hard look internally and locally to see what we would have been doing in their place. How many near misses have we had? Could it have happened at our program or to me? It is time to face the elephant in the road and deal with it. The problem begins with you and me. There is no agency or institution to fix this. It belongs to us.

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