



Flight Nurses Elaine Philipson
and Paul Mazurek



IN THE SKY

**SAVING
LIVES**

IT'S THE HIGH LEVEL OF CRITICAL CARE PROVIDED DURING TRANSPORT THAT SETS U-M'S SURVIVAL FLIGHT APART FROM SO MANY OTHER AIR MEDICAL TRANSPORT PROGRAMS.

BY RICK KRUPINSKI

In a small town in southeast Michigan, a desperate father rushed his 3-month-old son to the nearest emergency room; the baby presented *in extremis*, and doctors feverishly worked to bring him back from the point of death. When, after all they could do with the resources they had, the boy continued to decline, the physicians called Survival Flight.

A medical crew was dispatched to transport the infant to the U-M Health System where more extensive resources could be

employed in the effort to save the boy's young life. Upon arrival at the scene, however, Survival Flight Nurses Elaine Philipson and Paul Mazurek knew that the immediate focus needed to be on stabilizing the infant so that he could survive being transported to the U-M. Working with staff at the referring hospital, they were able to temporarily stabilize the child, only to have him lose vital signs again after the mother arrived. Again they stabilized him; again he lost vitals. When the rigors of yet a third



Critical Care Transport
Manager Denise Landis

effort failed to stabilize the infant's condition, the parents made a gut-wrenching decision. "Enough," they said. "Enough."

Philipson and Mazurek remained with the parents — a time of consolation and acceptance for all of them — for an hour-and-a-half beyond the infant's death. A note the parents later sent to them, thanking them for their valiant efforts to save their son, and for their compassion, helped the two nurses find some peace around the experience.

Based in the Department of Emergency Medicine, Survival Flight is more than transport of very sick patients; it's the highly specialized care those patients receive from expert flight nurses before, during and after transport. Survival Flight is also more than the emblematic helicopter with its 200-mile radius; the program includes a fixed-wing air-

equipped with the very best in critical care technology and supplies. Survival Flight is at its core the cohesive, dedicated, expert team which, according to an array of metrics, makes it one of the best — and certainly a leader among — air medical transport programs in the country. Its four-word vision statement, "To be the benchmark," guides everything the program does.

While taking obvious pride in their work, Critical Care Transport Manager Denise Landis calls Survival Flight "just a spoke in the wheel of U-M health care," an extension of the physicians who care for patients. That "spoke in the wheel" is comprised of 20 flight nurses highly and broadly trained in critical care, as well as eight communication specialists who monitor five radios and eight telephone lines. The aircraft are leased, an arrangement that also provides 18 full-time pilots and seven mechanics.

Cross-training among flight nurses is key to Michigan's program. "A lot of flight programs have specialty teams — that can minimize resources at the bedside," Landis says. With cross-training and experience in every intensive care unit — and staying up-to-date with a fast-changing world of medicine — the Survival Flight nurses form a comprehensive, interchangeable team of critical care specialists. "We cover everything from

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craft capable, for instance, of transporting patients to the U-M from Michigan's Upper Peninsula or even from Haiti after the 2010 earthquake, and procuring organs for transplant from facilities around the country. And it's more than service by air: When weather or other conditions preclude the air ambulance from flying, ground ambulance services, contracted with Huron Valley Ambulance, are a ready option.

Above all, it's more than a fleet of impressive aircraft

geriatric to pediatric/neonatal and pre-hospital care," Landis says. And while most Michigan air medical programs carry a required paramedic in addition to a flight nurse, U-M flight nurses are dual-licensed as paramedics, allowing the greatest level of expertise to be dedicated to the patient in transit.

Spending extra time on the ground, as Philipson and Mazurek did, is something other flight programs might not do. "A lot of newer programs are for-profit," Landis says. "There's nothing wrong with making a profit, but the pressure to do so sometimes can mean a push to lower costs and achieve the greatest possible volume to improve the profit margin," she continues. "Our aircraft are very high-end, and all our staff members are full-time. With the high acuity of patients we transport, I believe all our staff — communications, pilots, nurses — need to work full-time. If they don't, it's hard to keep up because things change so fast."



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“We’re fortunate that the Health System understands that this is an expensive program to run,” adds Mark J. Lowell, M.D., medical director of the Survival Flight Program. “At one of our appeals to the Regents for new equipment, one of them said, ‘We put our best people on those aircraft. Make sure they’re as safe as they can possibly be.’”

The 2007 Survival Flight crash into Lake Michigan near Milwaukee, which killed all six air and medical crew members on board, still stirs emotions in whoever speaks of the event — one of the U-M’s darkest hours. “When our airplane crashed, it was the communication specialists who held things together,” Landis says. “They were in a mode I’d never seen before and don’t ever, ever want to see again.”

“The crash had a devastating impact on a number of levels,” Lowell adds. “We gave all the flight nurses the option to fly or not fly. They all chose to fly again. ‘Yes, it was horrible — it *is* horrible,’ they said, ‘but we have to get through it. There are patients who need our services.’” The program resumed operations just four hours after the tragedy. Lowell pauses to keep his composure. “I’m privileged to be part of Survival Flight,” he says.

As the program’s medical director, Lowell writes the protocols for procedures and treatments, and reviews every patient chart “to make sure the quality of care we’re providing is appropriate and up to our standards.” He calls his job an easy one. “This is the most self-motivated group I’ve ever worked with. They know their job and they want to do it well — they want to do it better than anybody.”

If the annual competition sponsored by the Air Medical Transport Conference is any indication, they achieve their

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goal. For the past three years, the national critical care skills competition, which uses the latest in human patient simulation technology and real-life scenarios, has been won by flight nurse teams from the U-M, and last year Survival Flight shared top honors with a Canadian team at an international competi-

tion in Prague. Three of the current flight nurses — Paul Mazurek, Elaine Philipson and Jeff Thomas — have been named national Air Medical Crew Members of the Year. “Three from one program — that’s unprecedented,” says Lowell.

With an influx of new air medical programs, competition for patients has heated up, Lowell says. “It’s the biggest challenge to the program right now. The level of care we provide is much higher than others, and referrers need to understand that it’s not just the flying, it’s what’s going to happen during the flight.”

A former U-M pediatric ICU nurse dedicated to caring for “very sick kids,” Donna Robinson found herself intrigued one night when a pair of Survival Flight nurses brought in a very sick boy. “The presentation they made, the report they were able to give me, the grasp they had on the boy’s condition and history — it was very significant to me,” she says. “Our huge ICU team worked on the boy for three hours, and these two nurses had been at his bedside on their own during the flight.”

Robinson talked with them about the skills necessary to become a successful flight nurse. With their encouragement, she got the experience she needed and became a Survival Flight nurse herself in 1997. Now chief flight nurse, she schedules aircraft staffing, helps make sure that nurses’ skills are kept current, and participates in the considerable administrative work of running a large 24/7 venture of life and death importance — as well as continuing to fly.

The teams of flight nurses are co-equal, according to Robinson. Protocols from the medical director and a systematic way of approaching diagnosis and treatment preclude the need for hierarchy between them. In the rare event disagreement over patient treatment should occur, nurses call the referring and receiving physicians to reach a consensus on how to proceed. “It’s a little more apparent,” Robinson says, “when flying with someone who doesn’t fly consistently and doesn’t know the full scope of our protocols.”

Residents, for example. All emergency medicine residents fly at some point; Survival Flight is a rotation in their training. “In the beginning we may teach them some tech skills and decision-making trees, but by their fourth year they’re comfortable, knowledgeable, and their skills are up here,” she says, gesturing high in the air.



Medical Director
Mark Lowell

Shifts are 12 hours, but with 99 percent of calls being unscheduled, there's an axiom among the crew: Don't make after-shift plans. Robinson recalls a memorable case that indicates why.

With then-resident Brad Uren (M.D. 2002, Residency 2006, now Survival Flight's associate medical director),

Robinson traveled to Saginaw to pick up a young boy on a ventilator; it was around 5 p.m. The boy's condition deteriorated and he became too sick to transport with the equipment they had; they needed ECMO — a temporary blood oxygenation process developed by professor of surgery

Robert Bartlett (M.D. 1963) for extreme cases of respiratory failure. That meant returning to Ann Arbor for a second helicopter, surgeons and ECMO equipment needed for the complex procedure. Robinson stayed behind with the boy; it was approaching midnight. Throughout the night, she ventilated the boy by hand, a laborious and exhausting process. The patient was coded at one point, but Robinson was successful in bringing back his vital signs. It was nearly 6 a.m. before Survival Flight returned with ECMO support, which sufficiently stabilized the boy's condition for transport to University Hospital. Pausing to contain the emotion still there, Robinson adds, "The patient eventually got well and walked out of the hospital."

The first such program in Michigan, Survival Flight has been transporting critically ill patients for 27 years. It began with a single helicopter with a flight-nurse/physician team and has grown to meet demand over the quarter-century to a fleet of three Bell 430 helicopters (two in service at all times, and one as back-up), a fixed-wing Cessna Citation Encore, and ground ambulance service. Since those early days, Survival Flight has flown more than 4,000,000 miles — the distance from Earth to the moon nearly 17 times over.

Early in the program's history, Professor of Surgery Richard Burney, M.D., medical director of Survival Flight when it initially was located in the Department of Surgery, studied the difference between a nurse/attending physician team and a



Chief Flight Nurse
Donna Robinson

nurse/nurse team, measuring data such as morbidity and mortality. “There was absolutely no difference,” Landis says. It was then that the medical crew composition changed to the two-nurse team it is today, freeing the physician to remain on the ground to care for patients. Fewer than 10 percent of air medical programs today use the nurse/nurse model that’s in place at Michigan, relying on a nurse/paramedic team instead.

Last year’s outbreak of H1N1 influenza brought both challenge and innovation to Survival Flight’s transport of patients with acute respiratory distress syndrome. Moving them with a ventilator posed serious risks. ECMO has protocols H1N1 patients often don’t meet. Survival Flight Nurse Jeff Thomas, who had experience administering nitric oxide to neonatal patients as a means of respiratory support when he was a flight nurse in Iowa, wondered if the same procedure could work with adults. After lengthy discussions with physicians, technicians and other nurses, criteria for its use were developed. Says Landis, “Once the protocol was in place, we expected maybe four transports that year in anticipation of the H1N1 season, and ended up doing 12 in the next few months.” Thomas is continuing research to further assess the effectiveness of nitric oxide treatments.

On a late-August Sunday, the hottest day of the summer, Flight Nurses Joe Mollinger and Jeff Pietsch begin their shift at 7 a.m. In the small, dimly lit communications room, the pilot reviews the weather, aircraft, and protocols of the day with them and the communication specialists on duty, then goes off to complete a checklist review of the helicopter. Mollinger and Pietsch complete their own review of the aircraft, making sure medical supplies and equipment are ready to go.

Time spent waiting for a call is not downtime for the nurses; they update charts and work on presentations, educational materials, and upcoming conferences Survival Flight conducts — locally and around the state, including Michigan’s Upper Peninsula. The Survival Flight team is a primary source of education in the latest critical care techniques and equipment for first responders such as firefighters and ambulance crews.

Asked if the life-and-death urgency of the job ever costs him sleep, Pietsch pauses before speaking. “It’s not that death doesn’t bother me; it does. But if I know that I did the best I could possibly do, I don’t lose sleep over that. If I feel I may not have performed at my very best — that’s a sleepless night.

“People ask me all the time: What’s the worst that you’ve seen?” Pietsch says. “I tell them, I’ve seen a mother grieving the loss of her child.” A profound silence hangs in the air after his words.

At 1:05 that afternoon, a call is relayed by the communications



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team that a newborn needs to be transported from a smaller hospital in Michigan to the U-M. Pietsch gets the 192-pound isolette, in which the hours-old infant will be kept during transport. Mollinger catalogues small vials of narcotics and medications that may be needed, verifying and accounting for each.

The isolette and supplies aboard, pilot and nurses enter the helicopter and strap themselves in. Throughout the flight checklist, they wipe sweat from their brows beneath their maize and blue helmets. The fire-retardant blue flight suits, a recognizable emblem of the Survival Flight crew, are confining and hot.

The main rotors begin to spin. The deafening sound mounts as they quicken their rotations. The helicopter lifts several feet off the ground, hovers for a few moments, then swoops away, the big block-M leaving no doubt that Michigan’s Survival Flight is once again on a critical mission to save a life. [M]

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