

AirWaves

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New Program Director Appointed

In March of 2006, the Air Care Board of Directors announced the appointment of Rick Morley, Director of Flight Operations to the position of Program Director. He will continue to fill the role of Director of Flight Operations while assuming this new responsibility.

Rick began flying helicopters in his native country of Canada, primarily supporting oil, gas, and mineral exploration as well as forest service related activities. In 1986, he



Rick Morley new Program Director also holds position of Director of Flight Operations.

ventured into the helicopter EMS field working on a contract in northern Ontario with Toronto Helicopters, which eventually became part of the Canadian Helicopters Organization. After four years in that position, Rick moved to the Grand Rapids, Michigan area to work for Butterworth AeroMed. While at AeroMed, he served as company aviation safety officer and for several years as chairman of the Michigan Association of Air Medical Services safety committee. Feeling the lure of Florida's sunshine, the next stop was West Palm Beach, where he flew the Trauma Hawk helicopter for the Palm Beach County Health Care District. Additionally during this time Rick worked part time at Flight Safety International's Sikorsky Learning center where he taught Helicopter Instrument Refresher and Crew Resource Management classes.

Unable to stay away from Michigan's varied meteorological offering, he was quick to return to the area in February of 2001 when a position with Air Care came open

in Kalamazoo. Rick brought multi-helicopter experience in EMS, including Bell, Dauphin, Sikorsky, and Augusta aircraft. He holds a helicopter Airline Transport Pilot (ATP) license, a Fixed Wing Commercial license, and an Advanced Ground Instructor Certificate.

In June of 2001, Rick assumed the duties of Director of Flight Operations for Air Care. During this time Air Care has been able to replace a long leased aircraft with an owned dedicated back-up ship, N365A. Air care has also revived FAA Operations Specifications for IFR (Instrument Flight Rules) and upgraded this capability to include single pilot IFR operations. Two proprietary instrument approach procedures using GPS (Global Positioning System) has been developed serving hospitals in the Air Care service area. In addition to his duties with Air Care, Rick serves as a Site Surveyor with the Commission on Accreditation of Medical Transport Systems.

Rick looks forward to the challenge of leading the Air Care team as we strive to provide the highest quality of patient care in the rapidly changing Air Medical environment.

Watch for news of the October 7 Fall Conference!

Thank You Marshall, Michigan

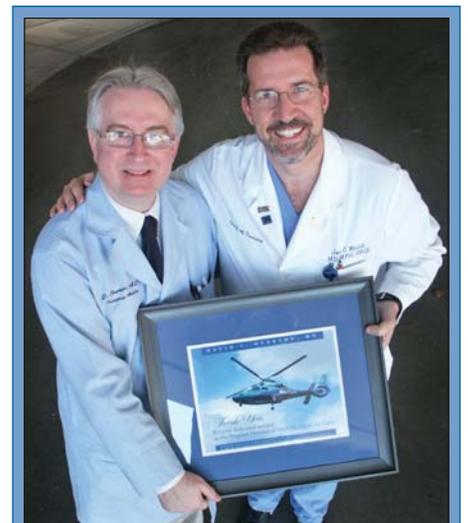
West Michigan Air Care would like to take this opportunity to thank Mitchell Price, Airport Manager and everyone in Marshall for the time and energy they put into the helipad project.

Air Care is grateful to you for your perseverance in bringing this project to fruition. It was a long arduous task but the final outcome is a tribute to your dedication to safety.



Safety is the highest priority in the transport of critically ill/injured patients. The Marshall helipad is an excellent example of how a community can strive to maintain safety and excellence in patient transportation.

Air Care would like to acknowledge your efforts and look forward to utilizing the helipad in cooperation with the Marshall Fire Fighters.



West Michigan Air Care bids a fond goodbye to Dr. David Overton. Dr. Overton was the program director for Air Care from November 2000 to December 2005. The photo features Dr. Jon Walsh (right) presenting a service plaque to Dr. David Overton (left).

“Voodoo Medicine” – A Trauma System Success Story

– Dawn Johnston, RN

Looking out the window of his hospital room at Select Specialty, 31-year-old Jacob Triebisch loves to watch the Air Care helicopter take off and land, but cannot recall his own flight with us on March 25, 2006.

“We were going to my nephew’s wrestling match with my girlfriend, Lori Buys, and her daughter, McKenna,” recalls Jacob. “I don’t remember anything after leaving the house that day.”

Jacob was one of the drivers in a two-vehicle collision one mile north of White Pigeon that left him with injuries so severe, he was not expected to live.

Chief Mike Heydon of Constantine Fire Department remembers responding to the accident. “White Pigeon Fire Department was there before us. The area was on the line between our coverage areas. We had to extricate the driver. The passengers were conscious.”

“There was a lot of blood in the car,” says paramedic, Michael Nemeth. “They had been T-boned by a pick-up truck and their car had come to rest within 5 feet from a nearby house. The car’s front windows were blown out and the driver’s door was pushed in 2-3 feet. The driver was lying across the front seat. I put in an oral airway and bagged him, then intubated him after he was extricated.”

Lori and McKenna would require treatment for minor injuries, but Jacob’s injuries were life-threatening. He was flown by Air Care to Kalamazoo on a ventilator with obvious head, chest and abdominal trauma. Despite bilateral needle decompressions to his chest to improve his breathing and aggressive IV fluid therapy, Jacob’s blood pressure was only 80/40 upon arrival at Bronson Hospital.

Dr. Mark Dittenbir received the patient in the Trauma and Emergency Center where his care was continued in earnest. Jacob was then admitted to the Trauma Care Unit and trauma surgeon, Dr. Sheldon Maltz. In addition to a brain injury, Jacob had fractures to his ribs, pelvis and face, as well as lacerated internal organs. Ultimately, he would need 6 chest tubes for his collapsed and bruised lungs and would undergo radiology procedures to stop his internal bleeding.

Dr. Maltz was also very concerned that Jacob’s aorta, the large artery near the heart, was torn. Although this injury is often fatal, Jacob’s torn aorta was, incredibly, not leaking arterial blood. So surgery on the aorta could wait, especially since it would have put his injured brain at further risk.

“If we didn’t have the Licox [a diagnostic tool that measures brain tissue oxygenation], we would have lost his brain function,” said Dr.

Maltz. “And we were stuck because Jacob required [treatments that opposed each other] for his aorta and brain injuries. His status was so tenuous he almost died three times.”

Multiple physicians and surgeons were consulted to help Jacob. His complicated care required the vigilance of two nurses around the clock for several days. “The nursing staff was all over this guy,” says Dr. Maltz. “Their care was impeccable.”

Jacob’s family members anxiously passed the days at his bedside.

“Seeing my son in that kind of condition...it was all just horrible and overwhelming,” says Jacob’s mother Paddie Kilgore. “It felt like we were



May 22, 2006. Jacob, still recovering, with pilot Ray Segorski and Director of Clinical Operations Jan Eichel, and flight nurse Dawn Johnston.

there all the time. Hundreds of people, family and friends, were praying for him all over the country.”

Four days after the accident, Jacob’s lungs were in trouble. Running out of options, Dr. Maltz decided to try continuous hemodialysis, a treatment that would remove extra fluid from Jacob’s lungs and body. “It was Voodoo medicine,” says Dr. Maltz with a grin. “A long shot.”

And it worked. Jacob’s lungs began to recover.

Jacob recalls, “When I woke up weeks later, my family was standing around my bed. I thought, ‘Man, what the hell did I do?’ I couldn’t talk because of the breathing tube. Everyone did their best to answer the questions in my eyes.”

Jacob’s father and brother, Lloyd and Adam Triebisch, flew across the country multiple times to be with Jacob. “Within a few days of my second visit, he was able to get a few whispers out,” says Lloyd, with emotion. “He squeezed my hand. You could look in his eyes and see he was there. He was back.”

“Finally,” says Jacob’s stepfather, Richard Kilgore, with a smile, “after weeks of being in Jacob’s hospital room Dr. Maltz told us to ‘Get out of here. Go get a life.’ Jake was getting better.”

Jacob would stay in intensive care for 5 weeks before being transferred to Select Specialty. Today, Jacob’s torn aorta has almost repaired itself, reducing the likelihood he will need surgery for it.

“Jake’s progress can easily be called a miracle,” says Robert Desotelle, CEO of Select Specialty, “but it really is a testament to an outstanding trauma system in southwest Michigan. Jake had the opportunity to recover due to the care he received at the accident scene including the foresight to call Air Care, the skill of the flight crew, the services provided by Bronson’s Level I Trauma Center, and the program at Select. He will now go on to finish his recovery at a rehabilitation hospital.

Dr. Maltz says bluntly, “According to his risk-of-death score when he came here he should be dead now. Jacob is very fortunate. He’s as tough as they come.”

“I tell him he’s been given a second chance,” says Jacob’s stepfather, Richard, “but he still has a long way to go.”

Jacob continues to receive therapy as his injuries heal and is glad when each milestone is reached. His hard work is rewarded with returning strength and the encouragement of his family, friends and caregivers at Select Specialty.

“Lots of people have sent gifts and cards,” says Jacob. “I feel different now...more lovable. I talk to my folks more often. I’d like to start a church group...one that helps people recover from anger, drugs or bad decision-making. I also want to get back to work, go fishing, and paint and re-do our house.”

On the morning of his departure from Select Specialty’s long-term acute care facility, Jacob is buoyant about the next phase: inpatient rehabilitation. His mental function has continued to improve since our first interview. There is no delay in answering my questions today. His family is thrilled that he is talking and acting like himself again. When Jacob and I discuss the many people who have helped in his rescue and recovery, he has a message for them all: “I’m thankful for everyone who had a hand involved. It’s a miracle that I’m here today. And I’m thankful to God, too.”

Current Research in Medication Assisted Intubation at Air Care

– Kevin Franklin; RN, EMT-P

The personnel at West Michigan Air Care (Air Care) are committed to providing the best pre-hospital and inter-hospital medical care. In order to accomplish this goal, all staff participates in ongoing activities directed towards improving our operations and care of patients. The medical crew is responsible for developing and participating in research that affects the care we provide.

In the past decades pharmacological agents have been employed to improve intubation success rates of patients that do not have complete loss of muscle tone. A number of techniques and medications have been used with varying success. Medication Assisted Intubation (i.e., RSI) is becoming more common in the pre-hospital environment for Field Paramedics and Flight Crews. At Air Care our current work on MAI's is focused on identifying medications used in current practice and evaluating the evidence to support their use. Each medication is being evaluated for its efficacy in improving intubation conditions while limiting side effects from this invasive procedure.

Over the past year four personnel from the medical crew have been actively involved in researching our current practice with MAI and how it can become better. These personnel include Bob Mayberry, RN, EMT-P, Glenn Ekblad, DO, and Medical Director for Air Care, Paul Horvath, MD, Emergency Medicine resident for Kalamazoo Center for Medical Studies (KCMS) and Kevin Franklin, RN, EMT-P.

Formerly the MAI protocol was displayed in a single flowchart, that was found to be difficult to interpret, and had multiple side notes, and failed to address different patient populations. After review of published articles, in addition to multiple currently accepted Emergency Medicine Texts used in the United States, an easy to read Matrix to facilitate the right medications for the

right patient populations, was designed by Bob Mayberry, RN, EMT-P. In addition, a larger review of over 500 published articles is being evaluated by the MAI researchers to provide further evidence to support our findings and improve upon the MAI matrix. The patient populations currently being evaluated are Hypertensive patients, Head Injury patients with increased intracra-

AirWaves I will discuss the sedatives and neuromuscular blocking agents that one may employ in order to provide the best pharmacological advantage for emergency intubation.

The first medication that has become standardized in emergency intubation and specifically with MAI is the use of oxygen. Since normal atmospheric oxygen is present at 21% and normal end

Medication	Normal to Hypertensive TBE() / TICP(s) AAA (s) / AAD(s)	Normotensive	Hypotensive / Hypoperfusion / Shock	Reactive Airway	Status Epilepticus	Predicted Difficult Airway	Arrest / Near Arrest Crash Airway	
Pre-treatment	Oxygen	15 L/min NRB(v) with adequate SpA02(v), RR(v), and V _T (v) BVM (x) w/ OPA(x) PRN (x) w/ SpA02 < 90% or RR < 8 Adult or < 15 Child						BVM w/ OPA 15 L / min
	Atropine	0.02 mg / kg IVP(x) or IM(x) for age < 8 PRN for ↓ HR due to vagal response and/or with repeat SCB(xiv) administration Min dose 0.1mg / Max dose 1mg						
	Lidocaine	1.5 mg / kg IVP	None	1.5 mg / kg IVP PRN - TBI	1.5 mg / kg IVP	1.5 mg / kg IVP PRN - TBI	1.5 mg / kg IVP PRN - TBI	None
	Fentanyl	3 mcg / kg IVP	1 mcg / kg IVP over 30 - 60 sec	None	1 mcg / kg IVP over 30 - 60 sec	1 mcg / kg IVP over 30 - 60 sec	1 mcg / kg IVP over 30 - 60 sec	None
Sedative Hypnotic	Etomidate	0.3 mg / kg IVP	0.3 mg / kg IVP	0.2 mg / kg IVP	0.3 mg / kg IVP	None	0.3 mg / kg IVP	None
	Midazolam	0.025 - 0.1 mg / kg IVP	0.025 - 0.1 mg / kg IVP	None	None	0.1 mg / kg IVP	None	None
	Ketamine	None	None	1 - 1.5 mg / kg IVP or 4 - 8 mg / kg IM	1 - 1.5 mg / kg IVP or 4 - 8 mg / kg IM	None	1 - 1.5 mg / kg IVP or 4 - 8 mg / kg IM	None
	Thiopental	3 - 5 mg / kg IVP over 60 seconds	3 - 5 mg / kg IVP over 60 seconds	None	None	3 - 5 mg / kg IVP over 60 seconds	None	None
	Propofol	Adult: 1.5 - 2.5 mg / kg IVP Children: 3 - 3.5 mg / kg IVP	Adult: 1.5 - 2.5 mg / kg IVP Children: 3 - 3.5 mg / kg IVP	None	None	Adult: 1.5 - 2.5 mg / kg IVP Children: 3 - 3.5 mg / kg IVP	Adult: 1.5 - 2.5 mg / kg IVP Children: 3 - 3.5 mg / kg IVP	None
Neuro-muscular Blocker	Succinylcholine	1 - 2 mg / kg IVP	1 - 2 mg / kg IVP	1 - 2 mg / kg IVP	1 - 2 mg / kg IVP	1 - 2 mg / kg IVP	None	1 attempt ETI then 2 mg / kg IVP or IM PRN
	Rocuronium	0.6 - 1.2 mg / kg IVP	0.6 - 1.2 mg / kg IVP	0.6 - 1.2 mg / kg IVP	0.6 - 1.2 mg / kg IVP	0.6 - 1.2 mg / kg IVP	None	None

Current Matrix in use for Air Care. Practitioners are encouraged to use the matrix to assist in clinical practice. Readers are hereby advised that they may not reproduce or distribute any material under different authorship that is published by Air Care in the AirWaves without the express permission of all authors.

nial pressure, Normotensive patients, Hypotensive patients, Restrictive Airway Disease patients, Difficult Airway patients and Near Resuscitation patients (Crash patients).

Initiation of the Airway Matrix above has resulted in improved compliance with established medication regimens for the noted populations by the Flight Crew(s) involved. In addition it has provided evidence to the appropriate use of particular medications in particular patient populations to limit the side effects associated with intubation via direct laryngoscopy.

In this first part, of a 4 part series, I will discuss the need for 2 of the 4 pre-medications that are currently used in practice by Air Care, as well as list the major references that we have cited for these. In upcoming editions of

expiratory oxygen is ~16-18 %, each patient has a large percentage of Nitrogen that makes up ~ 80% of their Tital Volume (Vt). In MAI it has been found that at least 3 – 5 minutes of 100% oxygen administered with a snug fitting mask is necessary to displace the Nitrogen present in normal atmospheric air^{1,2,3,4,5,6}. This increases their reserve oxygen supply to 5x normal prior to the intubation attempt. This in turn allows a longer period of tolerated apnea after administration of a NMB.

For patients that are in acute distress and have poor oxygen saturation even with 100% oxygen, a bag valve mask (BVM) assist prior to and during intubation has been shown to provide the patient with a buffered time to complete laryngoscopy and intubation^{1,2,4,6,7}. This pre-medication step has resulted in a significant decrease in the amount of desaturation

Current Research in Medication Assisted Intubation at Air Care

(continued from page 3)

that occurs with endotracheal intubation of patients.

The second pre-medication that is used for MAI is the anti-cholinergic Atropine. Atropine is utilized at a dose of 0.02mg/kg (no less than 0.1mg total) in all pediatric cases less than 10 years of age, and for all patients, when a second dose of a Depolarizing Neuromuscular Blocking (DNMB) agent is required. Atropine is best utilized at least 3 minutes prior to intubation in order to appropriately alter the nervous system response to intubation.

In pediatrics, the current research has found that children under the age of 10 have an increased parasympathetic reflex response to vagal stimulation that occurs when the posterior pharynx, hypopharynx and laryngeal structures are stimulated^{1,2,4}. The result is a pro-

found decrease in the heart rate which may be so profound as to produce asystole. Atropine assists in intubation by blocking the activity of the parasympathetic system at the efferent nerve fibers and preventing propagation of the reflex during laryngoscopy and intubation.

Utilization of these 2 medications during MAI will assist practitioners with decreasing the natural physiological side effects of this invasive procedure. Oxygen oversaturation will cause

Nitrogen washout and prolong the time before desaturation occurs, and Atropine will assist in preventing bradycardia in pediatric and 2nd dose DNMB patients. **In the next addition of the AirWaves we will discuss the use of the other pre-medications, Lidocaine and Fentanyl, and how they assist in controlling the physiological responses that occur from endotracheal intubation.**

References:

1. Roberts and Hedges, *Clinical Procedures in Emergency Medicine, 4th Edition*, Saunders, 2004, Philadelphia PA, pp100-114
2. Tintinalli, Judith E., Kelen, Gabo D., Stapczynski, J. Stephan., *Emergency Medicine A Comprehensive Study Guide, 6th Edition*, McGraw-Hill, 2004, New York NY, pp91-118
3. Wolfson, Allan B., *Harwood-Nuss' Clinical Practice of Emergency Medicine, 4th Edition*, Lippincott Williams & Wilkins, 2005, Philadelphia PA, pp1151-1155
4. Wall, Ron M., Murphy, Michael F., Luten, Robert C., Shneider, Robert E., *Manual of Emergency Airway Management, 2nd Edition*, Lippincott Williams & Wilkins, 2004, Philadelphia PA, pp180-188
5. Mort, Thomas C., *Preoxygenation in critically ill patients requiring emergency tracheal intubation, Critical Care Medicine*, November 2005, Volume 33, #11, pp2672-2675
6. Gамbee, Mark A., Hertzka, Robert E., Fisher, Dennis M., *Preoxygenation Techniques: Comparison of Three Minutes and Four Breaths, Anesthesia & Analgesia*, 1987; 66: 468-470
7. Swanson, Eric R., Fosnocht, David E., Barton, Erik D., *Air Medical Rapid Sequence Intubation: How Can We Achieve Success?, Air Medical Journal*, January/February 2005, Volume 24, #1, pp 40-46

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