

Case Study

Brett Wellman, RN, EMT-P,
HealthNet III

End-Tidal CO₂ in Chest Trauma

On the afternoon of August 8, 2007, HealthNet III was dispatched to the Williamson Memorial Hospital Emergency Department in Williamson, W.Va., for the care and transfer of a 67-year-old male trauma patient to awaiting trauma services in Huntington, W.Va. The patient was an unrestrained front passenger in a frontal impact motor vehicle collision. He initially was diagnosed with bilateral pneumothoraces and a tracheal tear with subcutaneous emphysema to the head, neck, torso, pelvis and upper extremities.

Assessment upon arrival of the flight team revealed an 80 kg male patient, orally intubated and sedated, with substantial subcutaneous emphysema as described, and diminished breath sounds with expiratory wheezing due to pulmonary trauma with inflammation and edema of the lower airways. The chest and abdominal walls were rigid and distended. There were no obvious indicators of a developing tension pneumothorax as vital signs remained within normal limits; the trachea was midline with no jugular vein distension. The patient was not difficult to ventilate with a bag valve device. The patient also was managed with two large bore IVs, an orogastric tube and a foley catheter.

During packaging for critical care transfer, the patient was fully immobilized and transport monitoring devices were utilized. Sedation, opiate analgesia and chemical paralytic agents were administered. Pulse oximetry consistently showed oxygen saturation at 100%, yet capnography revealed that the end-tidal carbon dioxide (ETCO₂) level was between 24 and 26 cmH₂O while being ventilated at 16 breaths per minute. The flight team further discussed the plan of care and agreed to decrease the ventilatory rate to stabilize ETCO₂ levels. At 8 breaths per minute, the ETCO₂ remained between 36-40 cmH₂O during transfer the SpO₂ remained at 100%. This manipulation of ventilatory rates allowed for greater expiratory time and proper gas exchange in the damaged pulmonary tissue.

The patient was further managed for hypotension during transfer with a 500mL crystalloid bolus for transient hypotension. Upon arrival at the trauma center, all vital signs and monitoring parameters were within normal limits, and care was relinquished to the trauma team.



PILOT'S PERSPECTIVE

Inadvertent Instrument Meteorological Conditions

Tom Reddick, Pilot, HealthNet II

Whether it is a corporate or EMS operation, helicopter pilots at times operate in challenging weather conditions. An encounter with weather that does not permit continued flight under visual flight rules might occur when conditions do not allow for the visual determination of a usable horizon (e.g., fog). An unplanned transition from visual to instrument flight is an emergency that involves a different set of pilot actions. It requires the use of different navigation and operational procedures, interaction with air traffic control, and airmedical resource management (AMRM).

Consideration is given to the local flying area's terrain, airspace, air traffic facilities, weather, and available airfield instrument approaches. Pilots are able to readily identify the minimum initial altitude and course in order to avoid obstacles and terrain. Current instrument en route and approach charts for the route of flight are essential. Upon entering inadvertent weather, priority is given to control of the helicopter. Pilots keep it simple and take the following actions, one at a time.

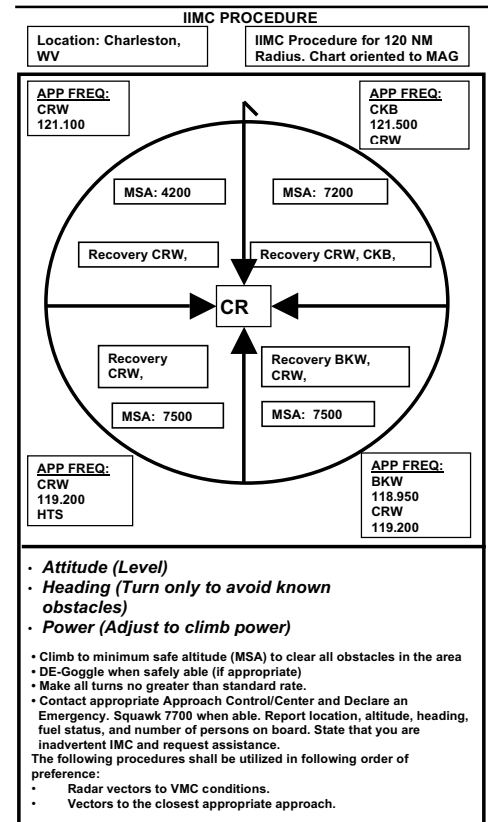
1. **ATTITUDE.** First use the wings on the attitude indicator to level the helicopter.
2. **HEADING.** Maintain heading and turn only to avoid obstacles.
3. **POWER.** Adjust to climb power.
4. **AIRSPEED.** Establish climb airspeed at the best angle of climb. Climb straight ahead until the crosscheck is established

and climb to the Minimum Safe Altitude.

5. **COMMUNICATE.** Contact air traffic control as soon as the helicopter is stabilized in the climb.

AIR METHODS CORPORATION
OPERATIONS MANUAL

Y-12/R-0/01-25-



QUESTION & ANSWER

LMA vs. PLA

Which is the best device?

When it comes to airways, most of the time you don't care how you get one. If it's a bad situation, you just want one fast. Of course, an ET (endotracheal tube) is preferable, but not always possible for a number of reasons. Two alternate airway options are an LMA (laryngeal mask airway) and a PLA (perilaryngeal airway). Most people have a preference, but is one really better than the other? There have been many studies done comparing the two. While there

are pros and cons to both, there is one major advantage to each. The PLA has been proven to have a better seal, possibly because of the larger pharyngeal cuff, thus increasing the efficacy of positive-pressure ventilation. Even as proficient as the seal in the PLA is, it still doesn't protect against aspiration. The most positive trait of the LMA is that there are fewer post-insertion complications than with the PLA.

Veronica A. Neale,
NREMT-P, CCT-P,

PROFILING OUR TEAM



Donnie Lindsey *BS, NREMT-P*

Medical Command Communicator

Donnie Lindsey has been involved in firefighting and EMS since graduating from Bridgeport High School in 1996. He attended college at WVU

where he was a four-year letterman as a long snapper for the Mountaineers. He graduated with a degree in Exercise Science/Coaching. In 2002, he completed the paramedic program at Fairmont State College. Donnie currently works full time at Bridgeport City Fire Department as a Professional Firefighter/Paramedic. He is active with the Professional Firefighters of West Virginia and currently is president of the Bridgeport Professional Firefighters Local 3692. Donnie also works for the EMS agencies in Monongalia,

Marion and Taylor counties and serves as the ALS Coordinator for Taylor County. He has additional training in fire and EMS including structural collapse technician, hazardous materials technician, Pro-Board Fire Officer 3, Pro-Board Fire Instructor 2, trench rescues and ropes. He also is a member of the West Virginia Regional Response Team 2-2.

Donnie has been employed at WVU Medical Command for three years. "I greatly enjoy the atmosphere at MedCom. The environment is very conducive to learning and using critical thinking skills," he says. Donnie currently is pursuing his nursing degree with aspirations of becoming a neonatal practitioner or working in trauma/critical care.

PROFILING OUR PARTNERS

Welch Community Hospital

by Robin Jones, RN, Flight Nurse, HealthNet V

Nestled in the mountains of the small community of Welch, W.Va., in McDowell County lies Welch Community Hospital. Serving the area for more than a century, the hospital first began providing free healthcare to miners and



farmers in January 1901. Community members commonly referred to the hospital as "Old Miners' Hospital No. 1" The facility also housed a nursing school from 1914-1944.

In 1984, a new building was constructed and the hospital's name was changed to Welch Emergency Hospital. In 2000, the name once again was changed, this time to Welch Community Hospital. Its mission is to be the

McDowell County and southern West Virginia.

Today, the hospital is owned and operated by the state of West Virginia. It is McDowell County's second largest employer with approximately 300

employees. It offers 124 beds including a 59-bed long-term care unit, as well as medical-surgical, intensive care, obstetrical, and surgical services. A walk-in and pediatric clinic also provides outpatient services and testing. The Emergency Department cares for approximately 10,000 patients per year, seeing a wide variety of both trauma and medical patients.

HealthNet is proud to partner with Welch

An Emergency Medicine Resident's Perspective continued from page 1

begin with orientation, participating in flights with one Flight Nurse and one Flight Paramedic for three days. What an orientation it is! I never realized how **continued on page 3** much stuff could fit in one helicopter. After that, we are functioning members of the flight team.

It is still early on in my flight month, but

I already have developed a new respect for aeromedical transport. First of all, it is a challenging job. There are many things that can occur – the possibility of sudden weather changes, equipment failure, or the inability to see a power line across the landing zone, just to name a few. I am amazed at the ability of the pilots. They are able to land in places that I

would have thought impossible.

Next is the job itself. This is by no means a simple transport from A to B. The helicopter is like a transportable ER. I was amazed at the number of drugs and the types of equipment that are carried on board. You have access to anything you need to treat a patient in any situation. Plus, the skill

level of the flight team is incredible. They truly make a difference in patient outcomes with their intervening care.

Thus far, I have learned many new things that will make me a better emergency room physician. I look forward to future flights with nervous anticipation. I am sure they too will be educational. I am very fortunate to be

President's Message



George P. "Chip" Sovick

National Leadership Through Safety Benchmarks

Earlier this year, HealthNet entered into a two-year contract with Human Factors Associates to administer and provide the results of a system-wide safety survey. The web-based survey was completed anonymously by members of the HealthNet team. The intent of the project is to gauge the current safety culture within our flight program, then to begin to make incremental changes over time to improve operational safety. This project is the first of its kind in the air medical industry in the nation. Human Factor Associates has conducted similar surveys with the U.S. Navy and other large helicopter vendors, but this was its first venture into the air medical field.

Currently, the HealthNet Safety Committee is developing a list of proposed improvements to be presented to management. It is anticipated that the recommendations will begin to be implemented in early fall. After completion, we will repeat the survey to assess changes in flight

THE HealthNet GENERAL STORE

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Stylish golf shirt in pale yellow with the full color HealthNet Aeromedical Services logo embroidered on the left chest. Shirt is made of 100% Pima cotton. Available in the follow-



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50/50 cotton/poly black T-shirt featuring the HealthNet logo and tag line on the front left chest and the HealthNet service area map on the back. Available in long or short sleeve. The following adult sizes are available: S, M, L, XL, 2XL, and 3XL. Please specify size on order form.



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The above items may not be available after October 31, 2007. Add shipping and handling to all orders. Allow 4-6 weeks for delivery.
* Note - Addresses must be physical street addresses. Orders are sent via UPS and cannot be shipped to PO boxes.

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INFLIGHT is a quarterly publication of HealthNet Aeromedical Services.

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INFLIGHT

HEALTHNET AEROMEDICAL SERVICES



Using Real-Time Technology Helicopters Outfitted with Satellite Tracking System

by Bryan S. Justice, NREMT-P, CCT-P,
Flight Paramedic, HealthNet II

HealthNet Aeromedical Services and its communication centers have completed system-wide implementation of a tool which provides real-time tracking for every helicopter in our fleet.

aircraft sensors and transmit this data.

Outerlink is a satellite tracking system which is comprised of a CP-2 satellite transceiver and modem, a cockpit display unit (CDU), two small flat-plane antennas, and software programs for tracking and communication. The CP-2 derives its position data from its internal GPS and automatically transmits the information to a geostationary satellite. Transmissions can be as frequent as every 10 seconds. The satellite relays the data to a ground station, which relays it to Outerlink, where it is placed on the Internet and made available to each of HealthNet's communication centers. Using proprietary software, communicators can log on to a Web site and see the helicopter's real time position. The CP-2 can transmit additional flight information, such as latitude, longitude, aircraft speed, altitude and more. In fact, it can accept inputs from up to eight

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Send questions,
comments and story ideas to



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Aeromedical Transport

An Emergency Medicine Resident's Perspective

by Shawn Smith, D.O.

Chief Resident, West Virginia University Emergency Medicine

As I arrived at the hospital, the morning dew glistened off the helicopter sitting on the pad. It was a beautiful day. The temperature was great and there wasn't a cloud in the sky. It was the first day of my flight month and I could hardly wait to get inside and get going. I met the Flight Nurse and the Flight Paramedic and quickly found that there was much I needed to learn before the first flight. This is here, that is there, switch this to that, don't touch this, and there should always be four of those. As my head was spinning from all of the new information, the radio crackled, "HealthNet I, Flight Alert. Scene flight, Tucker County."

The flight team had everything back in place and had two units of O-type blood in the helicopter in what seemed like a matter of seconds. I strapped myself in so tightly that I could barely breathe and cinched up my helmet. The engines started to moan and I felt the skids leave the pad. The next thing I knew, all I saw was a carpet of green trees and fields with an occasional river zigzagging its way through them. It was absolutely breath-taking. Suddenly, it hit me. Wow, this is it – my first flight!

As emergency medicine residents at WVU, we have the unique opportunity in our final year of training to become part of the flight team for one month. We

When Minutes Matter – HealthNet Is There