

Capnography...the next wave in pre-hospital medicine

By Scott Williams BS NREMT-P PFP-C
Flight Paramedic

Many different services, including Tulsa Life Flight, have been using capnography for a while now. It has primarily been a means to confirm ETT placement but it can do so much more. Since it has been around for a while it is probably a good time to review some of the fundamental aspects of what this powerful tool can do to help make our patients better, not to mention making our jobs easier.

Capnography is a non-invasive method of measuring ETCO₂ via a nasal cannula device or ET tube. Since CO₂ is a by-product of metabolism, the ability to determine the presence of CO₂ is a way to prove that metabolism is taking place. Metabolism is life, life is good! It works based on an infra-red sensor that is calibrated to be absorbed by the CO₂ molecule is either placed on the tube adapter (main stream) or through a small tube connected to the monitor (side stream or Microstream®). The normal range is 35-45 mmHg. This can provide some very valuable information concerning the patients' ventilation and perfusion status. It can be interpreted

in much the same way as an EKG. The shape and frequency of the waves can help diagnose, treat and monitor patients with conditions such as asthma, COPD, head injuries and cardiac arrest!

In addition to listening to breath sounds and gathering history on asthma and COPD patients, capnography can now confirm our findings concerning bronchoconstriction. The wave associated with bronchoconstriction is commonly referred to as a "shark-fin" pattern. This wave can be monitored as treatment is rendered for improvements in ventilation. This can be

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EMS PROFILE: Broken Arrow Fire/EMS

The Broken Arrow Fire Department came into existence as a volunteer fire department on June 15, 1906, and was established as a full-time paid department on January 1, 1964. Since 1964 the department has grown from 5 full-time personnel and one fire station to over 100 personnel, 3 volunteers, 3 civilians and 5 fire stations.

In January 1973, the Broken Arrow Fire Department began providing ambulance service to the citizens. The Broken Arrow Community has changed a lot since 1973, and their population ranks them as the fifth largest city in Oklahoma. Their coverage area consists of approximately 105 Sq. Miles, with an estimated population of 100,500.

In 1999 the Broken Arrow Fire Department improved its tradition of more than 30 years in providing Emergency Medical

Services to citizens of Broken Arrow by increasing its level of EMS providership to the level of advanced life support. Over 70 percent of the BAFD call volume involves medical-related emergencies, so the emphasis for this advance level of expertise is easily warranted. A typical medical call will provide no less than 5 highly trained firefighters who work as a team to provide the highest level of patient care. Today, the citizens of Broken Arrow have access to the finest Advanced Life Support (ALS) Ambulance Service in the State of Oklahoma. The BAFD is the only Fire Department in the state of Oklahoma providing ALS transport service to its citizens.

Tulsa Life Flight would like to commend Broken Arrow Fire/EMS for their continued level of expertise, advanced training and quality patient care.



especially helpful when enroute to the hospital when it is difficult to hear lung sounds.

Studies have shown that ET_{CO2} monitoring can reduce the number of unrecognized misplaced ET tubes to zero. Without ET_{CO2}, the incidence of misplaced tubes that go unrecognized is 23%¹. Not only will this help keep our patients airways patent, but it will help to monitor the rate and depth of each ventilation.

The first numbers that are seen in the initial steps of a cardiac arrest will provide a clue to the survivability of the arrest. Numbers above 15 mmHg have shown to be good predictors of the survivability of an arrest. The studies have shown that an ET_{CO2} of less than 10mmHg after 20 minutes of an arrest can accurately predict the lack of survivability of the pulseless patient². This could aid in the decision to terminate efforts of lengthy resuscitation efforts.

The American Heart Association has recognized that capnography is very accurate in measuring the effectiveness of CPR. Knowing this will allow the paramedic to change rescuers performing compressions if numbers drop due to fatigue. It will also inform the paramedic when the patient has a ROSC³. The ET_{CO2} will shoot up rapidly once the circulation has returned because of the increased blood flow through the lungs. With information like this we no longer have to keep doing compressions on a beating heart! We can now know precisely when the patient has a pulse, even if we have a hard time feeling it.

There are more applications than can be mentioned in a single article. There are websites and classes that can help providers learn to use this technology to its fullest extent. The ability to utilize capnography is one more tool that will help pre-hospital providers give the highest quality patient care available.

Tulsa Life Flight signs contract for 2 new Helicopters!

By Teresa Patton-Snell, RN, CCRN, CFRN, NREMT-P

Tulsa Life Flight's air medical program currently serves within a 150 mile radius of Tulsa, OK, flying an estimated 1,600 missions annually, and has served Oklahomans for the last 27 years. A contract was recently signed with Saint Francis Hospital and Air Methods for 2 new American Eurocopter 145 (EC145) helicopters. The first helicopter should go into service this fall and the second should be ready by spring 2008. Tulsa Life Flight chose the single-pilot IFR Certified EC145 for its excellent performance; fast cruise speed, twin-engines

and its large cabin capable of transporting two patients. Other safety features of the new EC145's are night vision goggles, wire strike protection, satellite tracking, and full color radar. With the rear loading doors, the EC 145 offers excellent cabin access from all sides as well as exceptional visibility for the Life Flight pilots, enhancing their ability to conduct safe and effective missions. The crews at Tulsa Life Flight are very excited to provide this state-of-the art aircraft to the citizens of Northeastern Oklahoma.

TLF News

TLF completes 40,000 safe flights

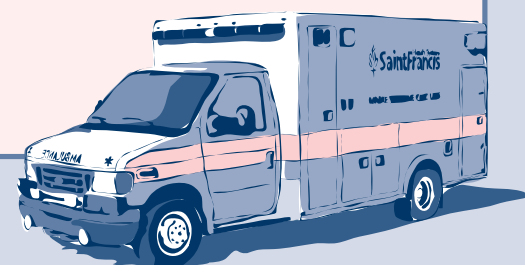
On April 12th, 2007 Tulsa Life Flight safely completed it's 40,000th accident free patient transport. This is a milestone accomplished by only a handful of Air EMS services in the United States. The TLF crew that completed the 40,000th flight included; Pilot- Mark Nurse- Kay, Paramedic-Shawn, and Communication Specialist-Jolene.

Congratulations to all Tulsa Life Flight crewmembers, past and present for accomplishing this remarkable milestone and for setting a terrific example of safety and great decision making in the air medical industry!

Tulsa Life Flight: There is a difference!

We need your photos! We would like to post photos on our website of our customers and crews interacting. Whether it is a ground crew training or scene, please share these with us. Please send these to Teresa.rn@tulsalifeflight.com

If you have any educational needs that Tulsa Life Flight can assist with please contact me at Teresa.rn@tulsalifeflight.com



We're on the web! www.tulsalifeflight.com