

FLIGHT ROUNDS

The Adult IO - it really is Big, Fast, and EZ: Overview and Case Study – Adult Intraosseous Infusions

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Flight For Life-Northern Illinois

The adult intraosseous (IO) infusion method has been available for almost one hundred years. Although the adult IO was the vascular access tool of choice in World War II, after the war it fell into disuse because trained medical providers who used the IO in wartime medical treatment had no occasion to use it in clinical settings when they arrived back home. It wasn't until the post Korea and Vietnam War era that pre-hospital care concepts were applied to civilian practice. During the 1980's, the use of the IO infusion gained popular acceptance in the field of pediatric medicine. Because of its success in gaining vascular access in pediatric patients in the mid-1990's, a renewed interest was sparked in using the IO for the adult population. A number of studies and trial programs were conducted across the country in adult IO use, with outstanding results. Today the standard of care for emergent vascular access in both the adult and pediatric population includes consideration of the intraosseous method.

How It Works

Bones are living, functioning organs - just like the other organs of the body - and require oxygen and glucose. Oxygen and glucose are delivered to bones through blood vessels which are distributed through the hard structure of the bone cortex to the softer skeletal centers. In each of the long bones (humerus, tibia, femur) there are a number of openings through which arteries enter the bone, as well as a number of openings where veins exit the bone and drain the blood back into the vascular system. Most of these openings are concentrated in the area called the epiphysis, located in the upper part or endpoint of the bone (the joint area). The hard cortex tissue is usually thinner in the epiphysis, which makes it an ideal spot to introduce the IO needle directly into the bone marrow.

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The Adult IO Indications For Use

continued from front page

Why choose the IO over other vascular access devices? Unfortunately, pre-hospital clinicians are unable to start IVs on more than six million patients annually. Precious time is wasted during multiple unsuccessful IV insertion attempts, depriving patients of life saving interventions that could be achieved via fluid and medication administration into the vascular system. To this date, over sixty-six medications, as well as blood products, have been tested and approved for use via IO administration.

So, when do you use it?

When time-critical patients require rapid intervention with fluids or medication and peripheral access cannot be rapidly established, such as:

- ✓ Hypotension
- ✓ Altered level of consciousness (GCS 8 or less)
- ✓ Profound dehydration
- ✓ Life-threatening arrhythmias
- ✓ Respiratory arrest
- ✓ Cardiac arrest
- ✓ Burns
- ✓ Continuing seizures
- ✓ Shock

(Please refer to the 2005 ACLS Guidelines for additional information about IO use)

Contraindications

- ✓ Fracture (fluid may extravasate into subcutaneous tissue)
- ✓ Previous orthopedic procedures near insertion site
- ✓ Infection at the insertion site
- ✓ Excessive tissue over the insertion site

Placement/Pain Consideration

(In this article, the author is referencing use of the Vidacare EZ-IO, which the author has used in field studies and is the type of IO needle used onboard the Flight For Life aircraft.) The placement of the EZ-IO is approved in both the proximal humerus and the proximal or distal tibia. Two needle sizes are available for use, based on the patient's weight. The puncture of the skin and drilling of the bone produces minimal, if any, pain – although caregivers often incorrectly believe that is the painful portion of the procedure. In fact, it is the introduction of the flushing agent, usually a saline flush/pressurized fluid bolus/or medication administration, which causes pain. That initial pain in the conscious patient can be decreased by administering a Lidocaine bolus – 1mg/kg with a maximum dose of 50mg - with the flush.

Case Study

Late summer of 2006, Flight For Life-Northern Illinois was requested to the scene for a patient with a near amputation

following a motorcycle crash. The helicopter was requested by local EMS for rapid transport to a Level I Trauma Center; I was the duty flight paramedic on this call.

After we arrived at the scene, we quickly realized that we had more than one patient that met the Level I trauma criteria. On initial assessment of patient #1, we found he had sustained a near amputation of the leg. The patient was otherwise stable, and the flight nurse completed the primary assessment. While that was being done, I assessed patient #2, the passenger on the motorcycle, who also had a near amputation of her left leg.

After primary assessment revealed patient #2 to be the most critical, we requested Flight For Life-Wisconsin to launch and rendezvous with EMS, who left the scene to transport patient #1 to a nearby community hospital. We remained with patient #2, assisting EMS personnel to complete initial care.

Patient #2 was in shock, with pale-gray skin, but conscious and responsive to voice. Her vital signs, obtained prior to our arrival, were a BP of 80/palpated, tachycardia with weak radial pulses, and a Glasgow Coma Scale of 15. The patient was diaphoretic and complaining of chest and back pain. She also stated she was unable to feel her left lower leg due to the traumatic injury. Local EMS had been in the process of starting an IV; the flight nurse was able to secure an antecubital IV line, and we quickly moved the patient to the running helicopter.

As we lifted from the scene and prepared to bolus with IV fluids and possibly administer O-negative blood, the flight nurse noticed that the IV was infiltrated. Now we had three choices: we could look for another IV site, place a femoral central line, or use the EZ-IO. The flight nurse deferred placement of the EZ-IO to me, as I had more experience with this procedure due to my fire department's field trial program with the EZ-IO. In a matter of seconds, the IO was placed and secured with no problems encountered. IV fluids and blood products were rapidly infused in flight, stabilizing the patient's deteriorating state of hypovolemic shock. We arrived at the Level I Trauma Center, did a rapid "Hot" off-load of the patient, and took her directly to the trauma room.

This case is an excellent example of the fast, efficient use of a new tool with an old history, which can result in an improved patient outcome. Today, the adult IO is another adjunct for use in obtaining vascular access, and you have several choices: the BIG-Bone Injection Gun, the FAST-Sternal IO, and the EZ-IO. As it is with trying any new technical skill, overcoming your initial resistance to using this method is the biggest hurdle for the EMS clinician. Once you have the opportunity to use this tool, you will be amazed at your success!

FLIGHT FOR LIFE - Northern Illinois Celebrates 20th Anniversary

Flight For Life-Northern Illinois (FFL-Northern Illinois) is proud to announce its 20th Anniversary. The satellite base came about through the collaboration and hard work of FFL Program Director Barb Hess, MRMC Executive Director Jim Ryan, Bill Riggs, Northern Illinois Medical Center EMS Director, and George Gallant, Medical Director for the Emergency Department at the Northern Illinois Medical Center.



The site began operations in May of 1987 with a Bell 206 Long Ranger at the Northern Illinois Medical Center in McHenry, Illinois. The pilots and mechanic were contracted from OmniFlight Helicopters, while the nurses and paramedics were employees of the Northern Illinois Medical Center. The nurses and paramedics worked in the ED until a flight request was received. The “hangar facility” consisted of a small flight office off of the Emergency Department, a helipad, a room formerly used for patients as quarters for the pilot, and a shed out by the helipad and closet for the mechanic’s tools.

The base now boasts a separate state-of-the-art hangar facility and crew quarters on the grounds of the Centegra Northern Illinois Medical Center. Flight nurses and flight paramedics are now employees of Flight For Life and the pilots and mechanics are employed by CJ Systems Aviation Group. The current aircraft is a BK117 A4 which is owned by the program. In January of 2007, the program purchased two new EC145s that will begin service in late summer/early fall of 2008. June also marked the 25,000th patient transport by the program.

FFL-Northern Illinois will celebrate its anniversary throughout 2007 in a variety of different ways with our referring and receiving agencies. A program-wide 25th anniversary is being planned for 2009. If you are a former patient, or know of a former patient, and would like to be invited to the 25th anniversary, please contact Kathy Mitchell, FFL Marketing Coordinator at (414) 778-5435, or e-mail her at kmitchell@mrmcfl.org to be included in a mailing for the event.

The success of FFL-Northern Illinois has been achieved through the hard work and dedication of its staff and crews as well as its partnerships with the referring and receiving agencies it serves. Without the confidence that our customers place in our commitment to safety and patient care, this 20th anniversary would not have been possible. Thanks to all of you for supporting our mission and

allowing us to continue to provide excellence in safety and patient care for the next 20 years! Below you will find a summary of the highlights of FFL-Northern Illinois history over the past 20 years.

The Story of FLIGHT FOR LIFE - Northern Illinois

May 1987 Flight For Life began a new “satellite” helicopter service, based at the Northern Illinois Medical Center in McHenry, Illinois. This service began operation in a Bell Long Ranger helicopter.

1990 Flight For Life-Northern Illinois completes its 1,000th patient transport.

June 1992 Flight For Life-Northern Illinois transitions into a twin-engine Bell 222UT helicopter.

September 1992 Flight For Life-Northern Illinois hosts a reception at the Northern Illinois Medical Center celebrating its fifth anniversary.

1995 Flight For Life-Northern Illinois transports its 2,000th patient, also having a record year of 410 flights.

Spring 1996 Flight For Life became the first air medical program in Wisconsin and the second in Illinois to be accredited by its national air medical association and CAMTS – the Commission on Accreditation of Medical Transport Systems.

June 1997 Flight For Life-Northern Illinois has a reunion celebration with patients, crew members, friends and dignitaries for its 10th Anniversary.

2000 Flight For Life purchases two BK117 helicopters to put into service at both sites.

Spring 2001 Flight For Life-Northern Illinois breaks ground for a permanent indoor hangar and crew quarters.

December 2001 Flight For Life-Northern Illinois moves into its new hangar. The Flight For Life program has transported 16,000 patients.

May 2002 Flight For Life-Northern Illinois celebrates its 15 years of service with an Anniversary/Open House celebration in at its new hangar facility.

October 2005 Stu McVicar, Flight For Life-Northern Illinois Flight Paramedic, receives the Association of Air Medical Services Medical Crew Member of the Year Award at the Air Medical Transport Conference in Austin, Texas.

October 2005 Tammy Chatman, Flight For Life-Northern Illinois Professional Relations/Marketing Manager receives the Association of Air Medical Services President’s Award at the Air Medical Transport Conference.

January 2, 2007 Flight For Life announces the purchase of two new EC145 aircraft for delivery in the first quarter of 2008.

May 2007 Flight For Life-Northern Illinois celebrates its 20th Anniversary.

FLIGHT FOR LIFE – Wisconsin's 2005 Scene Call of the Year Awards

The Scene Call of the Year Award recognizes the outstanding contributions to patient care by EMS professionals. Flight For Life-Wisconsin's 12th annual award winners are profiled below:

City of Brookfield Fire Department

The City of Brookfield Fire Department received this award for a very challenging mass casualty incident that occurred during late winter 2005. Not only were the department's entire on-duty resources committed to this scene, but mutual aid was requested from numerous other agencies due to the magnitude and scope of injuries in the multiple patients involved. This call clearly demonstrated the importance of mass casualty training, which ultimately translated into effective utilization of all resources during an actual event. Quick thinking and communication, and outstanding overall coordination and management of the many responding agencies was evident as the call unfolded. Scene safety, effective patient triage and stabilization, and efficient transport by air medical and ground ambulances to a Level I Trauma Center enabled the maximum benefit in medical care to be given to all injured patients.

Orange Cross Ambulance Service

Flight For Life-Wisconsin recognized Orange Cross Ambulance Service as the co-recipient of its 2005 Scene Call of the Year Award. The award was presented for a call that



occurred during the fall of 2005. This scene response demonstrated excellent management involving stabilization and rescue of a patient from a confined space located several floors below ground level. Early recognition that the patient met the Regional Trauma Advisory Council (RTAC) criteria for rapid transport to a Level I Trauma Center, scene safety, coordination of multiple agencies, logistical challenges required to retrieve the patient from the cramped space, and support to Flight For Life personnel as the patient was prepared for transport all contributed to a positive outcome.

On October 27, 2006, a large gathering of EMS providers and law enforcement welcomed recovered patient Danny Kielcheski to an award banquet in Sheboygan, hosted by

Orange Cross Ambulance, Kohler Company First Responders, Kohler Fire Department, the Sheboygan County Sheriff's Department - Dispatch, and the Kohler Police Department were all saluted for their efforts in assisting with this successful rescue.

FLIGHT FOR LIFE Announces the Purchase of Two New Helicopters

The Flight For Life air medical program is proud to announce it has ordered two state-of-the-art EC145 helicopters from American Eurocopter. The EC145 is a twin-engine helicopter with increased interior room for patients, medical staff, and equipment. Due for delivery in 2008, the two EC145s will take over from Flight For Life's current pair of Eurocopter BK117 helicopters. These are currently based in two locations: one at the Milwaukee Regional Medical Center's campus in Milwaukee, and the other at the Centegra Northern Illinois Medical Center campus in McHenry, Illinois. Since its inception, Flight For Life has logged over 25,000 accident-free missions transporting patients from accident scenes and between hospitals.



"For the past 20 years in Wisconsin and five years in northern Illinois, our BK117s have served our customers well," stated Jim Singer, Program Director for Flight For Life. "However, with the current changes in industry regulations, growth in demand for our services, and the extra capabilities and technology offered by today's next generation of helicopters, we felt it was time to upgrade our fleet. This is why we selected the EC145. Besides its increased speed, enhanced safety features, weight and fuel carrying capacity, reduced noise, glass cockpit, and spacious interior, the EC145s we are purchasing will be equipped with both single and dual pilot IFR (Instrument Flight Rules) control systems."

"We also chose the EC145 because it is Night Vision System-compatible," Singer adds. "This means our pilots, once trained, can wear Night Vision Goggles to see more clearly at night adding an extra margin of safety to nighttime operations." In addition, the aircraft will be equipped with autopilot, wire strike kits, a "Go-Around" button, satellite tracking and satellite phones, VHF and digital radios, GPS, XM Weather, and a more powerful searchlight.

Flight For Life anticipates delivery of the first EC145 in the first quarter of 2008, and the second to arrive within 30 days after that.

First a Rescue, then an Inspiration

Contributed by Kathy Robinson, Flight For Life patient

Three years ago, three Flight For Life crew members saved my life. To them, I can only say “THANK YOU.” To the rest of you readers, I can also tell you how Kathy, Guy and Steve helped me during the following two years of recovery, as well.

On May 18, 2004, I experienced what I initially thought to be a gunshot to the side of my head. That is how sudden and painful the onset of a ruptured brain aneurysm was for me. I had been out to lunch with my daughter, and she was dropping me back at the school where I was a teacher when the aneurysm occurred.



Thanks to quick action on the part of my daughter and the principal of the school where I worked, I was taken by ambulance to a local hospital. There, a CT scan revealed that I had a brain hemorrhage—a subarchnoid bleed. From there, I was transported by Flight For Life-Northern Illinois to the University of Illinois at Chicago Hospital equipped to handle my critical condition.

I spent nearly seven weeks in the Neuro-ICU unit, with an EVD drain, and an eventual craniotomy to clip the aneurysm. It was nothing short of a miracle that I survived. The days and months of the following two years have been spent in regaining my strength and overcoming the neurological effects of the trauma to my brain. Rehabilitation is not easy. In my estimation, anyone who has been “saved” by Flight For Life intervention has had some recovering to do! Some patients may be hospitalized for lengthy rehab services, or making a daily pilgrimage to outpatient Physical Therapy, like I did. It can be painful and discouraging. This is how Kathy, Guy and Steve helped me through those long, long months. I thought about that day two years ago. I did nothing to help myself that day. Of course, I couldn’t. In fact, once the initial onset of pain subsided, I was the one who thought I did not even need to go to the hospital! Indeed, I was counter-productive to my survival.

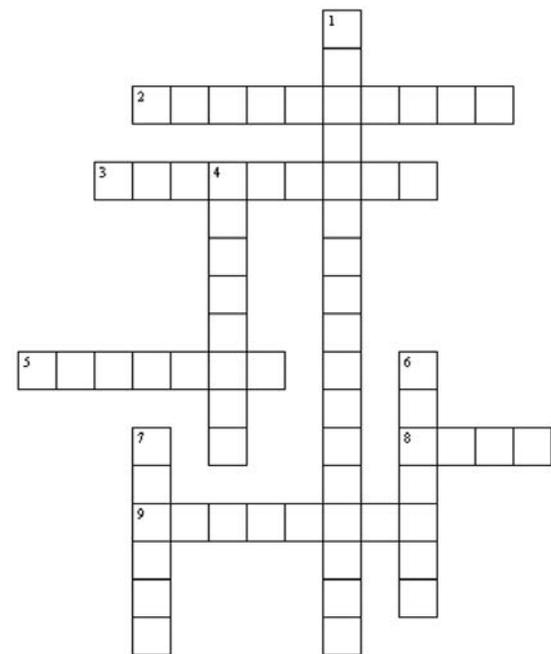
But my Flight For Life crew did what they needed to do that day, and did it well. They did their job, and now it was time to do mine. It was my time to listen to the therapists, do my hourly exercises and regain my strength. During my lengthy

recovery process, I was inspired by the memory of these professionals and what they had done for me. Now it was my turn to do my best – just as they had done theirs.

This past fall, I started to teach full-time again. I have 14 autistic children in my class and find each day to be rewarding. My work here in Michigan reminds me each day why I had a purpose for survival. I suspect my students and their parents will join me in being grateful to Flight For Life. So, a Flight For Life transport can change a life. They save lives every day. What they may not also know is that they also inspired a life to recover – mine. Thank you, Kathy, Guy and Steve.

FLIGHT FOR LIFE STEMI Crossword Puzzle

STEMI



Across:

- Most cardiac arrests occur due to blockage of this left anterior artery.
- This procedure is done under fluoroscopy to identify the coronary artery blockage.
- This NSAID is given orally to inhibit platelet aggregation during an AMI.
- This acronym is used for the medications given for chest pain.
- The type of MI you should restrict fluid boluses to.

Down:

- Recent surgery, black stools, and uncontrolled hypertension are all _____ to thrombolytic therapy.
- The type of MI that has ST elevation in Leads II, III and AVF.
- The major vessel where a cardiologist will place a cardiac catheter.
- Nitroglycerine given within 24 hours of this vasoactive medication will cause a precipitous drop in blood pressure.

ACS revises Trauma Triage Criteria

The American College of Surgeons has completed the new Field Triage Decision Scheme that replaces the old Trauma Triage Criteria. It is published in the *Resources for Optimal Care of the Injured Patient 2006* by the ACS and is available, in part, on our website, www.flightforlife.org. Below you will find the major changes that were made to the document. The changes are fairly new and, at this point, may not be adopted by your EMS system or trauma region.

Major Changes

Step One

- ✓ Removed Revised Trauma Score
- ✓ Added Respiratory Rate for Infants (<20 in infants less than 1 year)

Step Two

- ✓ Removed Burns and placed in Step Four
- ✓ Added Crush, Degloved or Mangled Extremity
- ✓ Changed wording on “Open and depressed skull fractures” to “Open or depressed skull fractures”

Step Three

- ✓ Added under Falls- Children: > 10 ft or 2 to 3 times the height of the child
- ✓ Removed from Auto Crash- Speed > 40 mph
- ✓ Removed Rollover
- ✓ Removed from Motorcycle- Separation of Rider from Bike
- ✓ Changed Auto vs. Pedestrian/Bicyclist significant impact to >20 mph (old was 5 mph)
- ✓ Changed Major Auto Deformity > 20 inches to >18 inches Intrusion any Site

Step Four

- ✓ Refined Age Criteria: Risk of Injury/Death increases after age 55
- ✓ Children: Should be triaged preferentially to pediatric-capable trauma centers (Removed age <5)
- ✓ Removed Cardiac Disease/Respiratory Disease
- ✓ Removed Insulin-Dependent Diabetes, Cirrhosis or Morbid Obesity
- ✓ Removed Immunosuppressed Patients
- ✓ Added End-Stage Renal Disease requiring Dialysis
- ✓ Added Gestational Age to Pregnancy (>20 weeks)
- ✓ Added EMS Provider Judgment
- ✓ Added Time-Sensitive Extremity Injury
- ✓ Burns were moved to Step Four from Step Two

“This Field Triage Decision Scheme, originally developed by the American College of Surgeons Committee on Trauma, was revised by an expert panel representing emergency medical services, emergency medicine, trauma surgery, and public health. The panel was convened by the Centers for Disease Control and Prevention (CDC), with support from the National Highway Traffic Safety Administration (NHTSA). Its contents are those of the expert panel and do not necessarily represent the official views of the CDC and NHTSA.”

Send us your photos for our 2008 *FLIGHT FOR LIFE* Calendar

It's time to send us photos of your department working with our Flight For Life crew.

We are beginning to work on our 2008 calendar and would love to include your calendar-quality photographs from pre-hospital or hospital settings. The deadline for photos for the 2008 calendar is **July 31**.



If you have a photograph(s) to submit, please call Tammy Chatman at (414) 778-4573. Photos must be from 2006 to present and once submitted, become property of Flight For Life. Any photos not selected for the calendar may be used in other Flight For Life projects.

With your help, next year's FFL calendar will be full of more great photos!

Interested in a PHTLS Provider Course?

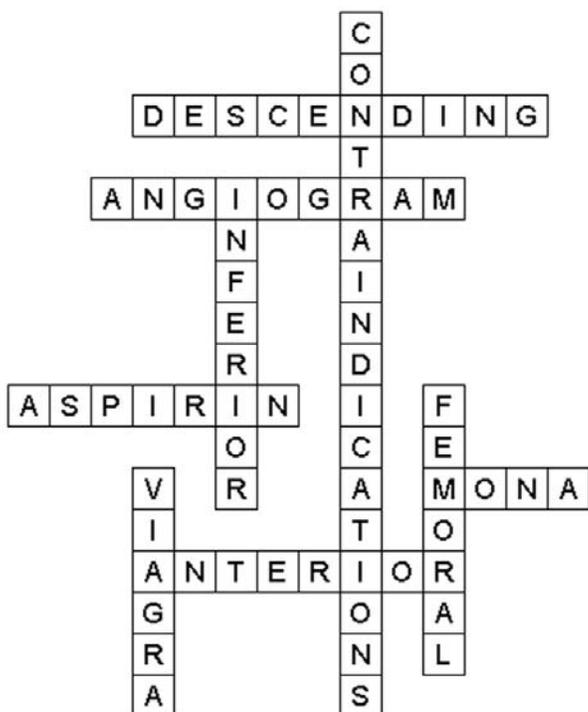
August or September . . . take your pick! Flight For Life personnel will conduct the PHTLS Course on:

- ✓ **August 11 & 12**, from 8 am - 5 pm held at Prospect Heights Fire Protection District HQ Station 9
10 E. Camp McDonald Road
Prospect Heights, Illinois
- ✓ **September 8 & 9**, from 8 am - 5 pm. Hosted by East Troy Rescue; held at East Troy Fire Department
8406 County Hwy ES
East Troy, Wisconsin.

For a brochure with registration form, go to our website: www.flightforlife.org and look under the **Site Quick Links** section in the right-hand column of the main page. Then click on the appropriate class: PHTLS Course, August 11 & 12, 2007, Prospect Heights, Illinois OR PHTLS Course, September 8 & 9, 2007, East Troy, Wisconsin.

Answers to *FLIGHT FOR LIFE* STEMI Crossword Puzzle

STEMI



Please label your equipment!

You could help facilitate the quick return of your equipment by clearly labeling each piece with your department or agency name. We have many departments with the same initials, so spelling out the entire department name is very helpful. Please also mark your proslints so we can easily retrieve and return them to you.

Thanks very much for your help!

2007 Upcoming Events/Conferences

FLIGHT FOR LIFE - Wisconsin Clinical Observation Participant Shift (COPS) Inservice (formerly "Ride-Along")

Our annual On-Campus Inservice held at Froedtert Hospital will be **Saturday, August 18, 2007**, from 10 am - Noon. This Inservice is open to pre-hospital personnel in these counties: Dodge, Fond du Lac, Jefferson, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha. A registration form is available at: www.flightforlife.org

PHTLS Provider Course

- ✓ **August 11 & 12, 2007 - hosted by Prospect Heights Fire Protection District**
- ✓ **September 8 & 9, 2007 - hosted by East Troy Rescue** (see article, page 7)

If your department is interested in hosting a PHTLS course, let us know and we will bring the show on the road. For more information, please e-mail Leif Erickson at lerickson@mrmcfl.org or call Kathy Mitchell at (414) 778-5435 and leave a message for Leif.

2007 TNS Refresher Course

Mark your calendars for our Trauma Nurse Specialist Refresher Class on **September 12 & 13, 2007**. Contact the Course Coordinators for more information at (414) 778-5429 or e-mail: Suzette Firnrohr, RN at sfirnrohr@mrmcfl.org Cindy Kurziak, RN at ckurziak@mrmcfl.org

2008 TNS Course

Dates were just announced for the 2008 Trauma Nurse Specialist course: **January 9, 10, 11, 16, 17, 18, 24 & 25**. Brochure and application are available at www.flightforlife.org. No applications will be accepted before September 1, 2007.

Emergency Services Conference: Trends and Issues 2007 - Save the Date!

Our annual conference will be held on **Saturday, October 20, 2007**, from 8:30 am - 4 pm at Kenosha County Center in Bristol, Wisconsin. Watch for brochures to be mailed out and available on our website, www.flightforlife.org, later this summer.

Centegra Northern Illinois
Medical Center



A Program of the Milwaukee Regional Medical Center
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