ILLINOIS ITLS news
Illinois Chapter of International Trauma Life Support
ITLS International Trauma Life Support ILLINOIS
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Can You Make the Diagnosis?

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You are dispatched to the scene in which a single 18-year-old male sustained multiple GSW to his left chest and back. You find the victim lying across the front steps of a local residence, bleeding from entrance and exit wounds to his chest and back. The patient, initially alert with a GCS of 15 but a pulse of 146, quickly decompensated 10 minutes later to a peri-arrest situation, becoming unresponsive with a pulse of 160 despite drug assisted intubation and initiation of two large bore IVs. The patient was transported to the closest trauma center with trauma activation initiated prior to the patient's arrival at the hospital.

There are a number of considerations with this case, especially given our current climate of violence and terrorism. With dispatch, do we know if there is an active shooter? Is there more than one victim? Upon arrival, is the scene safe and secured? Do we have an MCI? What are the immediate life-threatening injuries and what are our management priorities? If this is a trauma arrest, is the patient viable and should we resuscitate?

OVERVIEW

By definition, penetrating chest trauma requires a violation of the chest wall. The chest wall is made of soft tissue and bone. Skin, fasciae, and muscle overlay the rib cage and sternum, and the major organs within the thorax are prone to injuries when the chest wall has been violated. The lungs, heart, great vessels, tracheobronchial tree, esophagus, and diaphragm can be injured individually or simultaneously.[1]

Penetrating thoracic trauma, although less common than blunt trauma, carries a higher mortality. Nine percent of all trauma-related deaths are from thoracic injures, 33 percent of which are due to penetrating trauma. Although there is geographic variation in the United States, firearms and stabbings account for most injures that involve the thoracic wall. Other less common mechanisms of penetrating thoracic trauma are impalement during industrial accidents, falls, collisions, and blast injuries. The prevalence of firearm and knife-related injuries carries a significant social and economic burden to our communities.[1]

BALLISTICS

The damage inflicted to a patient is proportional to the characteristics of the weapon, the energy of the object, and the tissue penetrated. The most common low-velocity injury occurs when a patient sustains a stab wound. GSW are based upon two main categories: low-velocity and high-velocity missiles. Low-velocity missiles refer to projectiles traveling at less than 600 meters/second, and include all hand guns and some rifles. High-velocity weapons, such as from a military rifle, generally release bullets at speeds greater than 700 m/s, which is the speed at which explosive effects commonly are seen. Distinguishing between the two types is important in the evaluation of the trauma patient because high-velocity missiles not only cause injury to the structures adjacent to their path (as do low-velocity missiles) but also carry the additional factor of hydrostatic pressure and resulting cavitation from the increased kinetic energy imparted. In addition, the path of high-velocity missiles is not always straight. In penetrating chest trauma, specifically, the trajectory of the missile may be altered by structures within the thoracic cavity.[1]

HEMOTHORAX

A hemothorax is an accumulation of blood within the thoracic cavity. It is caused by injury to the intercostal vessels, the lung parenchyma, the internal mammary artery, or the great vessels; it limits the lungs' ability to expand; and it leads to a ventilation-perfusion mismatch. Because the hemithorax can hold up to four liters of volume, patients rapidly bleeding into this cavity can exsanguinate. As a result, patients who sustain penetrating injuries to the great vessels often succumb to their injuries in the field. On the other hand, injury to the smaller vessels causes blood to accumulate slowly within the thoracic cavity, leading to the typical symptoms of pain, dyspnea, and tachypnea.[1]

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Inside

Can You Make the Diagnosis?

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The management of a hemothorax after a penetrating wound usually involves a tube thoracostomy, fluid resuscitation, blood product transfusion, and possible tranexamic acid (TXA) utilization and/or operative intervention.

Specific Points

- It is important to note that once the chest tube is placed, there are indications to convert to a thoracotomy either in the ED or in the operating room. Rapid exsanguination from the chest tube, defined as more than 1,500 mL immediately returned (massive hemothorax), may be an indication to perform a thoracotomy in the ED if a patient presents or becomes a trauma arrest. With a massive hemothorax and vital signs present, an emergent OR thoracotomy is indicated. If the chest tube drainage remains 200 to 250 mL/hour for more than four to five hours, a thoracotomy in the operating room also is indicated to locate and ligate the bleeding vessel.

- Autotransfusion, also known as cell salvage, is the collection of blood from a bleeding site (i.e., chest tube) and the reinfusion of that blood into the same patient. It is indicated with large or massive hemothorax and decreases the need for allogenic blood transfusions.

- Fluid resuscitation in the trauma patient has been another topic of debate. Current literature has shown that large volume crystalloid or red blood cell-only fluid resuscitation leads to worsening outcomes by means of dilutional coagulopathy and the dislodgment of clots. In patients who are expected to require more than 10 units of red blood cells in 24 hours, the administration of blood products (red blood cells, platelets, and fresh frozen plasma) in combination rather than in isolation as in a massive transfusion protocol, has been shown to decrease mortality through improvement of coagulation parameters.

- Hemorrhagic shock is the second leading cause of preventable trauma deaths after airway loss. Survival is significantly improved with control of exsanguinating hemorrhage. TXA, an antifibrolytic used for many years to control spontaneous hemorrhage in hemophilia, has gained traction with its use in trauma to manage hemorrhage. The military reported in the CRASH-2 study that TXA reduced the risk of death from hemorrhage by factor of 1.5. TXA is most effective if given within 3 hours of the injury, and may be harmful if given after that time. Many civilian EMS and trauma systems have now adopted its use and it should be considered in those patients who have signs of hemorrhagic shock. Of note, TXA is not indicated in those patients who have an isolated traumatic brain injury.[2]

TRAUMATIC CARDIAC ARREST (TCA)

It seems appropriate to conclude with a discussion of field management of TCA. TCA is associated with very high mortality rates with overall survival between 0-17%.

Historically, one of the most important factors that should be considered in the management of traumatic cardiac arrest is the etiology of the traumatic cardiac arrest. Penetrating trauma, GSW and stab wounds in particular, have much better outcomes than blunt traumatic arrest. Thus, the trauma surgical societies' thoracotomy guidelines are more aggressive with penetrating trauma than they are with blunt trauma. The Western Trauma Association's data suggests that there were no survivors of blunt trauma with >10 minutes of prehospital CPR and penetrating trauma with >15 minutes of prehospital CPR. They support consideration of thoracotomy within that timeframe. The Eastern Association for the Surgery of Trauma published guidelines that remove any time durations of CPR and instead rely on signs of life. They suggest that a thoracotomy is either strongly or conditionally recommended for patients with penetrating injuries both with and without signs of life, and blunt trauma with signs of life only. As well, the National Association of EMS Physicians and the American College of Surgeons Committee on Trauma (NAEMSP/ASCOT) stated in their consensus guidelines in 2012 that "termination of resuscitation may be considered when there are no signs of life and there is no return of spontaneous circulation despite appropriate field EMS treatment that includes minimally interrupted cardiopulmonary resuscitation (CPR)."[1,3] Therefore, resuscitative measures should ensue if the TCA is recent and/or if there are signs of life, especially with a blunt etiology.

Field resuscitation of TCA should focus on the reversible pathologies that caused the arrest such hypoxia, obstructive shock from tension pneumothorax and cardiac tamponade, and exsanguination from hemorrhagic shock. A peri-arrest with severe cardiovascular instability would also focus on the same priorities in resuscitation. Chest compressions in trauma have been argued to be ineffective secondary to the hypovolemic heart as well as taking away from the provider's ability to perform life-saving procedures, and therefore, would have a lower priority than treating the reversible causes.[3, 4]

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LEFT: Representing Illinois as voting delegates at the International Trauma Conference Business Session were (left to right): Dr. Walter Bradley, Dr. Louis Hondros, Sue McDonough, Mike Dant, Karyn Eisemann, Rosemary McGinnis, and Ed Kemnitz; not pictured is Tony Cellitti. RIGHT: Attendees from ITLS Illinois have fun at the conference photo booth. Pictured, back row: Jeremy Hafliger, Ed Kemnitz, Mike Dant, and Tony Wlodarski; front row: Karyn Eisemann, Jeanie Debolt, Rosemary McGinnis, and Sue McDonough.

Highlights of 2017 Trauma Conference

The 2017 International Trauma Conference, held November 2-6 in Quebec City, was a success with more than 240 trauma care and EMS professionals from 18 countries worldwide in attendance.

ITLS Illinois was well represented with instructors in attendance from around the state. Serving as voting delegates for Illinois at the Business Session were: Dr. Walter Bradley, Dr. Louis Hondros, Ed Kemnitz, Karyn Eiseman, Rosemary McGinnis, Mike Dant, Tony Cellitti, and Chapter Coordinator Sue McDonough. Also in attendance from Illinois were: Jeremy Hafliger, Tony Wlodarski, and Lisa Malinowski.

See all conference photos on the ITLS Facebook page: Facebook.com/ITLStrauma.

The 2018 International Trauma Conference will be held in St. Louis, Missouri! See details on Page 5. We hope to see you there!

Board of Directors Elections

Three members of the Board of Directors were elected during the conference's Business Session. All are incumbents. Continuing their terms are: Peter Macintyre, ACP (Ontario); Eric Roy (Canadian Armed Forces); and Chen Zhi, MD (China 120 Beijing).

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ITLS 'Current Thinking' Position Papers Updated By Editorial Board in Dec. 2017

Have you reviewed the position papers published by the ITLS Editorial Board in December 2017? These "Current Thinking" topics reflect the latest research on hot topics in trauma patient assessment and management.

The positions authored in the "Current Thinking" can be incorporated into your ITLS courses immediately.

Download the following from ITRAUMA.org/ current-thinking/topics/:

- Advances in Management of Traumatic Cardiac Arrest
- Utilization of the Bougie Cricothyrotomy Technique for a Surgical Airway in Adults
- Prehospital EMS Management of Open Pneumothorax Using Chest Seals
- Utilization of the "LEON Criteria" to Predict Difficult Intubation
- Simple Thoracostomy for Traumatic Arrest in the Prehospital Setting
- SMS (Simplified Motor Score): A Potential Field Measure of Neurological Injury to Replace Total Glasgow Coma Score

ITLS prides itself on being a thought leader in prehospital care and education, staying up to date on best practices, industry standards, and leading-edge research. ITLS content is current, relevant, and responsive to the latest thinking in trauma management. All "Current Thinking" topics and resources are authored and/or reviewed by members of the ITLS Editorial Board.

Research Forum Abstract Showcase

2017 Winner Focuses on Pediatric Cervical Spine Clearance Pathway

The International Trauma Conference Research Forum featured four abstracts of original trauma research with presenters from the United States, Korea, and Colombia.

The abstract presented by Natalie Luehmann, MD, a General Surgery resident at Beaumont Hospital in Royal Oak, Michigan, was selected as the winner of the Excellence in Research award by the Forum's panel of judges.

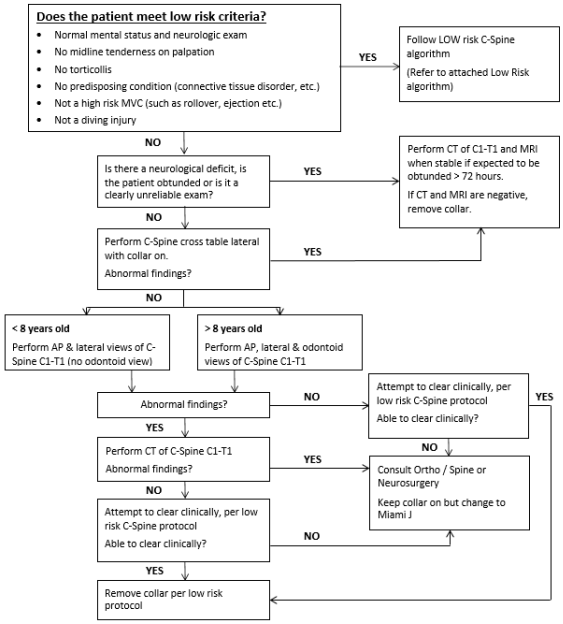
The abstracts from all selected presentations are available online at ITRAUMA.org/research.

Dr. Luehmann's winning abstract appears below:

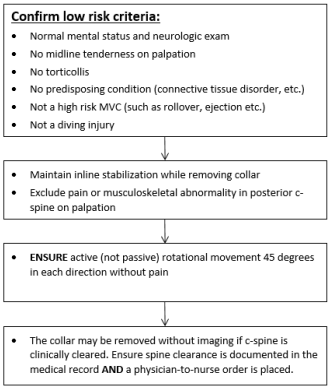
Implementation of Pediatric Cervical Spine Clearance Pathway – Initial Results

PEDIATRIC TRAUMA C-SPINE CLEARANCE GUIDELINES

NOTE: Maintain immobilization by C-collar during radiologic studies until spine clearance is accomplished



NOTE: Revert to high risk guidelines if ANY of the following conditions are not clearly favorable



**Created by physicians on our multidisciplinary committee as a guideline and does not represent providers obligation for an exclusive protocol or to replace clinical judgement

Background:
Pediatric cervical spine (c-spine) injuries are rare events with potentially devastating consequences. Injuries cannot be missed, but patients at low risk for injury should not be subject to unnecessary radiation exposure early in their lives. An established algorithm for c-spine evaluation can help balance these conflicting ideals in clinical decision-making.

Objective:
The study objective is to determine c-spine imaging rates before and after implementation of a standardized c-spine clearance pathway (CSCP). We also sought to identify the number of missed c-spine injuries and patients cleared clinically. Our hypothesis is that rates of c-spine imaging will decrease after implementation of a CSCP without any missed injuries.

Design:
A multi-disciplinary group including pediatric specialists in the fields of trauma surgery, emergency medicine, orthopedic spine surgery, neurosurgery, and radiology thoroughly reviewed relevant current literature to develop an algorithm to guide c-spine clearance in the pediatric trauma population. To evaluate the efficacy of our CSCP and provide early results, we reviewed patient charts 6 months before and 6 months after the implementation of our protocol.

Results:
Our initial results show patients treated using the CSCG received fewer c-spine radiographs (6.7% vs 39.6%, p-value < 0.05) despite higher injury severity scores (average ISS 9.5 vs 4.0, p-value < 0.05). Additionally, in the CSCG group there was a trend towards fewer computed tomography scans and more patients were cleared clinically (53.3% vs 20.8%, p-value < 0.05). There were no missed injuries in either group.

Conclusion:
Use of a standardized CSCP decreases unnecessary radiation exposure and allows more patients' c-spines to be cleared clinically without compromising patient care.

Impact:
Thus far, our data suggests that a CSCP is paramount to ensuring that patients are evaluated appropriately and adequately with regard to c-spine injuries.

Highlights of 2017 Trauma Conference

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ITLS Annual Awards

Four individuals were honored at the conference with ITLS' annual awards.

Jeff Gilliard, ITLS Florida Chapter Coordinator, was presented with the ITLS Ambassador Award for his work in promoting ITLS programs and demonstrating a clear belief in the ITLS mission. In addition to his longtime position at ITLS Florida, Mr. Gilliard travels internationally to bring ITLS training to a number of worldwide locations. He was unable to accept his award at the conference because he was conducting training in Bangladesh.

Ann Dietrich, MD, FACEP, FAAP, of ITLS Ohio, was presented with the John Campbell, MD, FACEP, ITLS Medical Director of the Year Award. Dr. Dietrich is a former Editorial Board member and editor of the ITLS Pediatric textbooks.

Genaro (Gary) Eudela, BSN, RN, ITLS Philippines - Prompt C.A.R.E. Chapter Coordinator, was recognized with the Pat S. Gandy, RN, ITLS Coordinator of the Year Award.

William (Bill) Bailey, PCP-A, PMP, longtime ITLS British Columbia - Justice Institute Chapter Coordinator, was honored with the Ray Fowler, MD, FACEP, ITLS Instructor of the Year Award.

Memorial resolutions were read in honor of Dr. James Creel, longtime medical director of ITLS Tennessee and one of the original BTLS authors, and George Eliadis, past ITLS Ontario chapter coordinator, both of whom passed away in 2017.

ITLS Competition

Seven teams competed in the annual ITLS Trauma Competition at the conference, using the ITLS assessment to triage and treat trauma patients in three creative and challenging simulated scenarios.

Teams represented Niagara EMS, North East Ambulance Service UK, Toronto Paramedic Association, Slovenia (two teams), and Quebec paramedic students (two teams).

The team from Toronto Paramedic Association was declared the 2017 winner. The team was formed in honor of George Eliadis, and named "Yia ton Yiorgo," meaning "For George" in Greek. Team members were: Martin Johnston (team captain), Jason Benaim, Christopher Rotolo, and Rachel Janer (alternate).

In memory of George, an inaugural Competition Award was created: the George Eliadis Memorial Award for Trauma Care Competition Individual Excellence. Connor McCulloch of Niagara EMS in Ontario, Canada, was selected as the first recipient of this special award. Mr. Eliadis' brother and son were in attendance at the ceremony to present the trophy. to Mr. McCulloch.

Save the Date for 2018 in St. Louis!

The 2018 International Trauma Conference will be held November 7-10 in St. Louis, Missouri! With the location within driving distance for so many instructors and providers, ITLS Illinois hopes to have a great showing at this year's event. Save the date and plan to attend!

The International Trauma Conference is the premier trauma conference attracting trauma and EMS professionals worldwide. Registration will open online this spring. More details are at ITRAUMA.org/conference.

The conference hotel is the Hilton St. Louis at the Ballpark, 1 S. Broadway, St. Louis, MO 63102. To make reservations, call 314-421-1776 and reference International Trauma Life Support Conference or make reservations online at ITRAUMA.org/stlouis. The conference room rate of $145 per night plus all applicable taxes includes complimentary guest room WiFi. The cutoff date for this rate is October 15, 2018.

8th Ed. eTrauma Online Provides Flexible Option for Provider Certification

Need a flexible solution for ITLS Provider certification? The 8th Edition ITLS eTrauma: Taking Trauma Training Online course features:

- A streamlined, intuitive new user interface
- Modern look and feel with updated art and animations
- New content focusing on updated SMR guidelines, hemorrhage control and TXA, mass shooting events and more

8th Edition ITLS eTrauma
Taking Trauma Training Online

8th Edition ITLS eTrauma is sold by Pearson Education through the MyPearsonStore website; a direct link is available at ITRAUMA.org/etrauma. New for the 8th edition course, course access codes will be delivered electronically immediately. Now you can start eTrauma right away, without the delay of shipping.

The 8th Edition ITLS eTrauma course offers three options: the online course accompanied by a hard-copy textbook and eText built in, for $133; the online course with the eText built in (no hard copy book), for $107; or the standalone online course for those who already own the 8th edition book, for $75.

What's included:

- 13 interactive lessons that correspond to textbook chapters
- 8 hours of CAPCE continuing education credit upon successful completion
- Option for physicians to purchase *AMA PRA Category 1 Credits™* separately (see details below)
- Option to take ITLS eTrauma for Advanced Providers or ITLS eTrauma for Basic Providers – different quiz questions depending on your skill level

Why choose ITLS eTrauma?

The interactive reinterpretation of the ITLS Provider Course lectures in an online format is flexible and self-paced, accessible and affordable, and accredited to provide continuing education hours. After completing eTrauma, students are eligible to attend an ITLS Completer Course in-person to earn ITLS Basic or Advanced Provider certification.

Physician CME available

For the first time, the 8th Edition ITLS eTrauma course will provide CME hours for physicians and PAs, as the activity has been approved for *AMA PRA Category 1 Credit™* by the American College of Emergency Physicians (ACEP).

ITLS eTrauma is also accredited for all levels of EMS personnel by CAPCE, the Commission on Accreditation of Pre-Hospital Continuing Education (formerly CECBEMS).

Can You Make the Diagnosis? Case Study

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CASE CONCLUSION

In the ER, the patient was resuscitated utilizing the massive transfusion protocol including TXA. A left sided chest tube placed yielded more than a liter of blood. He remained hemodynamically unstable and was taken to the OR. In the OR, a left sided thoracotomy was performed. Another 500 mL of blood and clots were evacuated. An acute injury was noted in the left upper and lower lobes of his lung with resection and repair achieving both hemostasis and pneumostasis. Further exploration did not reveal injury to the great vessels or heart. After an essentially unremarkable post-operative course, he was discharged home on the eighth day.

REFERENCES

1. Ademola A, Goldman K. Penetrating Chest Injury. Trauma Reports September 2017.
2. Alson R, Braithwaite S. Role of TXA in Management of Traumatic Hemorrhage in the Field. ITLS Current Thinking October 2016.
3. Chinn M, Colella MR. An Evidence-Based Review of Prehospital Traumatic Cardiac Arrest. JEMS April 2017.
4. Han K. Advances in Management of Traumatic Cardiac Arrest. ITLS Current Thinking November 2017.

Special thanks to:
Scott Vance RN, TNS, EMS Coordinator/ Emergency Preparedness Officer, Presence Mercy Medical Center, Aurora, IL

ITLS Illinois Advisory Committee News

Mark Your Calendar for 2018 ITLS Illinois Advisory Committee

The ITLS Illinois Advisory Committee will meet three times in 2018, on Wednesday, April 4; Friday, July 27; and Friday, December 7. All meetings will run from 10 AM to 12 PM.

Meetings are held at the ICEP office in Downers Grove and available via Skype for videoconference or audioconference participation. Groups may also opt to meet at Illinois Central College in Peoria and Memorial Hospital in Belleville.

As a reminder, all Affiliate Faculty are required to **attend one meeting every 2 years**; videoconference or audioconference meets the attendance requirement. Attendance at additional meetings is optional.

Committee Seeks Suggestions for Exhibit Opportunities

Do you know of a local conference, trade show or other event that offers exhibit space and would be a good opportunity to market ITLS Illinois? Please contact Chapter Coordinator Sue McDonough at suem@icep.org with your ideas. The committee is always looking to expand training in Illinois, and exhibits help make valuable connections to promote training and expand our reach.

Chapter Coordinator Can Help Facilitate Instructor Networking

Thank you to all the instructors who completed the 8th Edition Instructor Update. Instructors in Illinois are required to teach three times in the 3-year certification period to keep current and be eligible for renewal. If you are not employed by or aligned with an ITLS training facility and need to find courses to instruct at to fulfill this requirement, please contact Chapter Coordinator Sue McDonough at suem@icep.org. She will be happy to help you find a course location near to you and assist you in contacting the course coordinator.

Upcoming ITLS Illinois Courses

For the most updated list of upcoming courses in ITLS Illinois, including registration information, please visit http://cms.itrauma.org/CourseSearch.aspx. You do not need to log in to access this page. Here are some of the upcoming courses in Illinois:

Feb. 20-21: Combined Provider Certification
Registration: Dean Buch, T 618-779-5690
MedStar Ambulance, Belleville

Feb. 21: Advanced Completer Certification
(Prereq: ITLS eTrauma online course)
Registration: Andrew Larson, T 815-842-4938
OSF St. James Medical Center, Pontiac

Feb. 23-24: Combined Provider Certification
Registration: Karyn Eisemann, T 618-257-5736
Memorial Hospital, Belleville

March 1-2: Combined Provider Certification
Registration: Shelley Peelman, T 217-359-6619
Presence Regional EMS System, Champaign

March 2: Instructor Classroom Component
(Prereq: Provider course & Instructor Online Component)
Registration: Nicholas Fish, T 815-780-3114
OSF St. Elizabeth Medical Center, Ottawa

June 5: Combined Provider Recertification
Registration: Danelle Geraci, T 309-624-4638
PAEMS Office, Peoria

June 6-7: Combined Provider Certification
Registration: Danelle Geraci, T 309-624-4638
PAEMS Office, Peoria

June 19-20: Combined Provider Certification
Registration: Dean Buch, T 618-779-5690
MedStar Ambulance, Belleville

Sept. 21-22: Combined Provider Certification
Registration: Karyn Eisemann, T 618-257-5736
Memorial Hospital, Belleville

Oct.16: Combined Provider Recertification
Registration: Danelle Geraci, T 309-624-4638
PAEMS Office, Peoria

Oct. 16-17: Combined Provider Certification
Registration: Dean Buch, T 618-779-5690
MedStar Ambulance, Belleville

October 17-18: Combined Provider Certification
Registration: Danelle Geraci, T 309-624-4638
PAEMS Office, Peoria