

# NCEMSF NEWS

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***“This year we have outlined four core areas that will ensure continued growth of our organization***  
***1. Research***  
***2. Education***  
***3. Awareness***  
***4. Leadership”***

## Message from the President

Dr. George J. Koenig, Jr., NCEMSF President

Happy Holidays!

Perhaps this is the most hectic time of the year. As we count the days until winter break, we are confronted with the final hurdle of exams. It seems as if there are not enough hours in a day as we cram for exams, write papers, shop for gifts, and attend holiday parties. However, this time of year also affords us time to take a break and reflect on ideas that we have not had the time for throughout the year.

During the winter break, I encourage you to take a moment and reflect on your organization's goals and ask yourself: Are you on target to achieve the goals that you set at the beginning of the semester? Did you meet your recruitment goal? Is your training system meeting the needs of your new and current members? How are you ensuring that your members have the necessary leadership skills for the next academic year? What changes can you make in the coming semester to ensure completion of your goals?

Each year during winter break, we also take a moment to reflect on the goals of NCEMSF, review our success, and outline changes that will make our organization stronger in the coming year. This year we have outlined four core areas that will ensure continued growth of our organization: Research, Education, Awareness, and Leadership.

1) Research in EMS for many years has lagged behind traditional medical research. The number of randomized controlled trials, the gold standard of research, is sparse when compared to other aspects of medicine. While primarily, this is related to the funding of EMS research, there is also a lack of interest on the part of researchers. However, each day the number of unanswered questions regarding the delivery of modern EMS continues to increase. As an EMS system as a whole, we need to start systematically answering these

questions and begin to define the interventions with the maximal benefit. As an organization, we are poised to be the leaders for EMS research. Collectively, we have the knowledge, creativity, and enthusiasm to further research.

2) Education has been our primary focus for many years. It is the strength of our organization. Each year we dedicate a large portion of our resources to ensure that our annual conference provides the highest possible level of education. Nationally, we are known for the quality of product that we deliver at minimal costs to our attendees. However, we need to continue to look for ways to increase the availability of EMS education throughout the year. We need to evaluate web based resources to increase education for our members and promote the sharing of successful educational ideas and programs.

3) Awareness, as many of you know, is essential to the development of an organization. Many of us rely on word of mouth to promote the benefits of our organizations. NCEMSF has successfully relied on this methodology. However, while this is extremely effective in promoting your message, it limits your message to a smaller audience. We need to expand our public relations efforts similar to what we have advocated for our member organizations. We need to focus on increasing our presence as a national organization. To accomplish this, we will continue developing strategic alliances between NCEMSF and other EMS related organizations. We will also work towards creating a presence at other national conferences and trade shows. Lastly, we will develop multimedia resources to promote collegiate EMS.

4) Leadership development is essential to the growth of any organization. NCEMSF has

*(Continued on page 3)*

## Conference 2009 - February 27 - March 1 - Washington, DC

The 2009 Conference Web site and registration utility are now active. Visit the site today for answers to all of your conference related questions.

**WWW.NCEMSF.ORG/CONF2009**

The following is a sampling of some of the Web site content, please refer to the Web site for complete details.

### Conference Overview:

The NCEMSF Leadership remains committed to providing the most educational EMS Conference experience anywhere at the greatest value. More than forty sessions in five concurrent tracks guarantees something to interest everybody. The most difficult decision of the weekend may be which sessions to attend when there are two or three at the same time that appeal to you.

### Schedule and Program:

Activities for the conference will begin on Friday, February 27th at 5PM when on-site conference check-in opens. A welcome social will run from 8pm to midnight. Lectures will begin Saturday at 8am and will run through 6:30pm. Lectures on Sunday will begin at 8:00am and will run through 1pm. A more complete schedule will be posted online shortly before the conference date.

### Registration:

The only way to register for the conference is online. Click on registration and follow the online prompts.

### Fees and Policies:

Attendees save by registering and paying for the conference early. Personal members of NCEMSF receive a further discount as a result of their membership status if they register and pay before the end of the normal registration period.

*Early Registration - 12/1/08 to 1/17/09*

Member: \$65, Non-member: \$75

*Regular Registration - 1/18/09 to 2/21/09*

Member: \$75, Non-member: \$90

*Late Registration - After 2/21/09*

Member or Non-member: \$100

NCEMSF accepts checks, money orders, purchase orders, and most major credit cards for advance payment. Any payment or other mailed correspondence must be received by Wednesday, February 25, 2009. Credit cards are processed through PayPal. Only checks, money orders, and cash will be accepted for registration payment at the conference facility.

A conference registration for which payment is not received by NCEMSF within two weeks of registration will be automatically cancelled. This includes registrations that are to be paid with a university purchase order. If a registration is cancelled due to lack of payment, the registrant will have to re-register for the conference at the then-prevailing rate.

### Host Facility:

Located across the Potomac river from Washington, DC, atop the Crystal City Metro stop, and adjacent to Reagan National Airport, the Crystal Gateway Marriott offers an ideal location for an NCEMSF conference.

Conference attendees are strongly encouraged to stay at the host facility in order to gain the most from the conference experience. NCEMSF has arranged for a special conference room rate of \$129 per night plus taxes and parking. The special rate is guaranteed through February 6, 2009 so reserve your rooms early. Call toll free 888-236-2427 and mention group code NCENCEA or make your lodging reservation through the Marriott Web site.

### Transportation:

**Plane** - The host hotel is located just one mile from Reagan National Airport (DCA) and 28 miles for Washington Dulles Airport (IAD).

**Automobile** - The host hotel is easily accessible from I-95.

### Student Speaker Competition:

This symposium is a chance for student lecturers to showcase their presentation skills and earn bragging rights for their organization. The competition is judged on a speaker's ability to deliver a relevant high-quality seminar. If you are a student interested in giving a presentation, please attach a Word Document to an e-mail to vomackaspeaker@ncemf.org including: Name(s), Address, Phone #, E-mail, School, Topic, Presentation Synopsis (2 paragraph summary followed by Presentation Outline with each of your sub-topics and descriptions). Deadline for topic submission is February 1, 2009. Presentations should be approximately 45 minutes in length.

### Skills Competition:

Each team will compete in three scenarios. One scenario will be medical, one trauma, and the third scenario will be team building and require a fair degree of improvising. The teams receiving the highest three scores for the entire competition will be acknowledged at the awards ceremony on Saturday and be presented with trophies. Registration for the skills competition is available online. The registration deadline is February 25, 2008. The cost is \$10 per team.



## NCEMSF Awards Capture the Spirit of Collegiate EMS

NCEMSF recognizes outstanding efforts made by individuals and organizations through its awards program. Instituted in 1997, the program includes the following awards:

- Striving for Excellence
- Campus EMS Provider of the Year
- Outstanding Collegiate EMS Organization of the Year
- Outstanding Collegiate EMS Advisor of the Year

- Outstanding Collegiate EMS Web site of the Year
- Outstanding Collegiate EMS Video of the Year

Nominations for all of the above awards may be made by submitting all appropriate materials by February 20, 2009. See the Awards page on the Web site for complete details and submission instructions.

As a reminder, current academic year institutional membership is a requirement for eligibility for NCEMSF awards.

The winners will be announced at the awards ceremony during Saturday's conference activities.

Email awards@ncemf.org with any questions about our awards and recognition program.

## Collegiate EMS Week 2008 - 3rd Annual Yankauer Games

Raymond McGrath, Training Coordinator, Boston University EMS

On Friday, November 7, 2008, EMT-Basics from Boston University and Worcester Polytechnic Institute (WPI) took part in the 3rd Annual "Yankauer Games," an EMS skills competition unlike most other collegiate drills. Three teams competed for first place in events which tested their abilities to assess patients, work as a team and think quickly on their feet. The competition consisted of a relay race, an immobilization station, an MCI drill and a four station obstacle course. This year's theme was "Fitness in EMS" and featured events which utilized Boston University's Fitness and Recreation Center.

The "stair chair" relay component required each team to navigate the 1/7 mile track for a total of four laps. After each lap, the patient seated in the chair had to switch with another teammate before beginning to next lap. One participant remarked "we really wanted to see what speeds a stair chair could handle."

After a short rest, each team took part in the splinting station. Each team member was assigned an extremity injury that needed to be splinted. In order to make the event more challenging, several members of each team were given two injuries. Once an extremity had been splinted, that team member could no longer utilize the affected extremity. The teams had to strategize about the order in which they splinted each other since the last person to be splinted would be the most difficult. And you thought the splinting station for the state exam was difficult?

The next station to be completed was an MCI skills drill. Ten patients were

scattered around the five-story building. Each patient had a specific set of injuries which needed to be triaged. Each team was provided with a map of the building and the necessary equipment to triage these patients. Once all ten patients were located and evaluated, the team returned to the staging site to see if they had triaged the patients correctly. To make the station a bit more challenging, when one or more patients were incorrectly triaged, the team was told to go back and fix their mistakes. However, the team was not told which patients were wrong. The first team to accurately complete its triage list was the winner.

The fourth and final event to take place was an EMS Obstacle Course. A large pile of equipment was laid out, and each team was told that they would need to assess a patient or two during the event. No further details were given. From the pile of equipment, the teams needed to decide what equipment might be needed for the duration of the event. Any piece of equipment that was not obtained at this time could not be retrieved later. The teams then moved on to our indoor rock wall. BU EMS supervisors were suspended at the top of the wall. One member of each team had to tie into the wall (under supervision) and climb up to their patient. Once on scene, the EMT had to obtain vitals and pertinent information and relay those details to their team members on the ground. After descending back to the ground, the team moved to our fitness area where one team member began running on a treadmill. While this was occurring, the remaining team members obtained vitals and information used to complete a patient care report (PCR). The person running on the treadmill could not stop until the report was complete.

The final stage of the event required the teams to "build" a stretcher and move one member from the treadmills to the finish line. Each team was given a plastic bag, rain poncho, two backboard straps, an OPA and oxygen tubing. Two teams, one each from BU and WPI made an extremely close run to the finish line. After the four events were completed, the judges tallied the results and awarded prizes to the top three teams. The "Rookies" from Boston University were awarded the bronze ping pong ball. WPI's "A Team" came in second receiving the silver baseball. And the winner of the 2008 Yankauer Games was Boston University's "Joe D's Veterans" receiving the golden soccer ball.

After awards were distributed, participants enjoyed pizza and soda while watching an "EMS Video." Rumors of a rematch to take place in the spring were rampant at the after party. In addition, each team hopes to recruit more schools for the next Yankauer Games!

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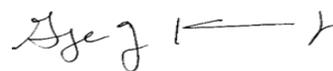
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been fortunate with the diversity of the knowledge within our organizational leadership. The advantage of NCESMF is the year to year consistency of our leadership. It has enabled us to develop leaders throughout all levels of our organization. Today, we are fortunate to have over 20 dedicated individuals from board members to committee chairs that all donate their free time towards the advancement of collegiate EMS. This year, in maintaining our commitment to the development of leadership, we will

have an educational track dedicated towards developing leadership skills at our annual conference. The track will provide our attendees with basic leadership skills as well as an opportunity for our current leaders to enhance their leadership skills.

With your help, I believe that we can make considerable progress in these four core areas before the end of the academic year. Together we can add "REAL" value to both NCESMF and our entire campus EMS community.

Best wishes for a safe and happy holiday break,



George J. Koenig Jr., DO  
President, NCESMF

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## Regional Roundup - Collegiate EMS Week 2008 Recap

News from Around the NCEMSF Regions

### From the National Coordinator

The Regional Coordinator Network exists to facilitate communication between NCEMSF and its nearly 250 constituents. It is through the Regional Coordinators that NCEMSF is best able to accomplish its mission of advocating and supporting campus-based EMS (CBEMS). The Regional Coordinators are equipped to assist each squad with the day-to-day issues it faces and to help publicize squad achievements. There are few issues that the NCEMSF leadership has not seen before and for which it is not equipped to offer advice and guidance.

### Canada

*Ryerson University* has kept busy doing lots of special event coverage for the City of Toronto. Events included Nuit Blanche, a well attended (1 million plus spectators) overnight art show, and the CN Tower climb just to name a few. *Ryerson* also participated in this year's Mixer - a Canadian campus EMS fall event similar to the conference but on a much smaller scale. For EMS Week *Ryerson* put on a great show with events all through the week including a health clinic, CPR-A-Thon and finished the week with an MCI/extrication scenario.

*McMaster University* hosted Mixer 2008 (as mentioned above, a fall mini-conference). Mixer was well attended by

approximately 150 students from 13 teams around the country. Events included a keynote address, a full day of seminars, semi-formal banquet, and a competition on the last day with closing ceremonies afterwards. The theme was "Expanding Horizons: Making the Most of Community Connections" which exposed responders to a variety of seminars focused on interactions with the University and the community. Congratulations to *McMaster* for putting on a great mixer!

*McGill First Aid Service* has launched its new website, which has to be seen ([www.mcgillfirstaidservice.org](http://www.mcgillfirstaidservice.org)).

*Wilfred Laurier, University of Waterloo, and Guelph* held their annual "Tri-University Competition", this year at *Wilfred Laurier*. This event is a small gathering of the three area schools to pit skills in a competition style event. It was well attended by all three schools.

### Central

*Creighton University* had its second annual EMS Competition on November 22, 2008. The competition consisted of a BLS or ALS skills challenge for teams of three EMTs or paramedics. In addition, *Scott Bourn*, who is the National Director of Clinical Programs for the American Medical Response National Resource

Center, spoke about "Hot Topics in EMS."

*Arizona State University's* Health and Counseling Student Action Committee launched a new Student Emergency Medical Services program this November. The team, based out of the Tempe campus' health center, will provide emergency-response care before paramedics arrive. *Sean McMullen*, a Nursing sophomore, helped to develop the program. *ASU* is the first school in Arizona to have a student-run EMS program.

### Massachusetts

*Boston University Emergency Medical Services* conducted another successful Yankauer Games where they once again placed first, with *WPI* taking a strong second place. Emboldened by their victory, they are looking forward to the skills competition at next year's conference.

*WPI EMS* is doing well - in addition to the second place showing at the Yankauer Games, they organized a successful comedy show for EMS week. They are updating their protocols and procedures in advance of a growing campus and squad, and are looking to work with the local ambulance company to improve medical transports.

*Brandeis Emergency Medical Corps (BEMCo)* also had a good EMS week with a different event everyday, ranging from CPR training to demonstration of skills. Their numbers are strong and operations are running smoothly.

### Midwest

Efforts are under way to start a new campus EMS organization at the *University of Toledo*. They have currently passed legislation with the student government and have met with the Dean of Students to discuss funding and operations. They are now trying to talk with the Chief of Police on campus to see if the organization could possibly be a division of the UT police department.

*CaseEMS*, *Case Western Reserve University's* EMS squad, promoted its presence on campus by celebrating National Collegiate EMS Week with EMS week t-shirts and a blood pressure screening service. To show their spirit,

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## Regional Coordinator Network

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West	Dan Stepan	west-rc@ncemsf.org

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they painted the campus "spirit wall" (a 50 foot wall of graffiti) with a person-sized version of their logo, informing the campus that they are "Fast, free, and well equipped."

### **Northeast**

*The College of New Jersey* Lions' EMS currently has about 45 responding members, the majority of which are EMTs. At the middle of the Spring 2008 semester Lions' EMS was given an apartment-style room in a residence dorm to utilize as its response/break room; the room has 2 sets of bunk-beds for a crew of four as well as cable TV and internet access. This is a significant step forward as Lions' EMS responds on foot and has not had a central location to respond from for the past several years. About 20 members completed an ICS-200 course brought to TCNJ's campus this Fall. The college also has purchased 9 Motorola HT1550s for the organization. Lions' EMS continues to offer AHA Healthcare Provider CPR to the campus community and works closely with TCNJ's School of Nursing to certify students for their clinicals. Lions' EMS will help co-sponsor a campus blood-drive with TCNJ's Health Services Office in early December.

### **North Central**

*The University of Chicago First Responder Corps* has filed an application for recognition as a First Responder unit with the City of Chicago. In the mean time, classes continue to build the base of student first responders and the efforts of the leadership are focused on gaining additional funding for operations.

### **Pennsylvania**

*Muhlenberg College* EMS has grown in size to 38 members, with 21 new EMTs joining from an EMT course that was held on campus. MCEMS is now using an online scheduling program, e-schedule.com for shift scheduling. A new suction unit was purchased, and they have requested funding from the school for the purchase of a Stryker stair chair to replace their old Ferno model. MCEMS also sponsored and coordinated its annual Mock DUI accident, in which 8 patients were severely injured and entrapped while members held officer positions under the Incident Command System, and worked with outside EMS services and Allentown Fire Department to triage, treat, and transport all patients. They also provided standby coverage when Bill Clinton, Barack Obama, and

Joe Biden spoke at Muhlenberg during the campaign.

*Penn State University's University Ambulance Service* and *Penn State University Emergency Medical Services Association* hosted a panel discussion of different medical professions. Members have also participated in drug training with the PSU PD, as well as burn training, and bike training for their bike teams. They have also scheduled HAZMAT training. Lastly, PSU EMSA is again taking a big part in the annual campus dance maraTHON to benefit charity

*Carnegie Mellon University* EMS actively supported Collegiate EMS Week by putting up posters for a CPR and First Aid course, for the EMT-B course to be taught in the spring, as well as a general information poster about CMU EMS, emergency contact information, etc. CMU EMS taught an ASHI Universal First Aid course and AHA Heartsaver CPR/AED course. Both were open to the campus community and both had great turn-out. CMU EMS participated in a long standing tradition at CMU of painting the Fence. The Fence exists at the center of campus and is painted almost nightly to advertise groups, events, etc. So, they took the Fence to celebrate National Collegiate EMS week.

*Temple University* EMS celebrated Collegiate EMS week by conducting an annual Blood Borne Pathogens training as well as reviewing documentation and patient refusals. They had a great roundtable discussion with their faculty advisor, Mark Denys, RN, BS, MHA the director of Student Health Services, and Dr. Jerry Wydro their Medical Command Physician.

*De Sales University* EMS, a new start-up EMS agency serving the DeSales campus has been busy working on training and public relations this fall. They are offering an ACLS for the EMT-Basic course on November 23rd, and have just completed a radio interview with Lehigh Valley NPR 88.1 FM WDIY. In the coming weeks they also have an interview with WFMZ Channel 69 news and have a press release posted on the NCEMS website. They have also received a station designation number with Lehigh County Emergency Services 9-1-1 Center and can be dispatched by callers who call 9-1-1 in addition to an on-campus emergency number.

*University of Pennsylvania MERT* is in the process of getting BLS Epi-Pens for their crews, and had just sent a group of their members through Basic Disaster Life Support Training. They are also planning to have several speakers coming in the next few weeks to discuss treatment of stroke, airway management, and cardiac care.

### **West**

*Loyola Marimount University* - "We just threw a big BBQ that gathered a few hundred students interest, which helped raise awareness about EMS week."

*Stanford University* - Collegiate EMS week for Stanford EMS (StEMS) ended with the final home football game of the season, marking two years of service with Stanford Football. With 24 active members, this second year of operations has seen exciting growth including providing more standbys at community events, the organization's incorporation into the campus disaster plan and acquisition of new equipment. With a newly equipped John Deer Gator with Stryker MX-Pro Cot attachment, StEMS has also been busy demonstrating its ability to respond to unconventional medical calls at Stanford Stadium and around campus. In the coming months, StEMS projects include ICS/NIMS compliance, member recruitment and participation in a January earthquake disaster drill.

*Santa Clara University* held an EMS Week Pizza fundraiser/question and answer session for those interested in taking the EMT class on campus.

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***Do you have news about your squad you'd like to share? Contact your regional coordinator and look for it in the next issue of NCEMS News.***

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## Four Key Principles of Collegiate EMS

Dr. Scott C. Savett, NCEMSF Vice-President

When I travel on business or pleasure, I enjoy taking time to meet with collegiate EMS groups that are in the city that I am visiting. Over the last few years I've visited schools in Los Angeles, Boston, New Orleans, and Ottawa.

When meeting with groups in person, it does not take long to sense the overall health of the organization. Several questions normally provide most of the key information. Specifically, I am always interested to hear about a group's recruitment efforts, succession plan for advancement within the organization, funding sources, and social activities.

### Recruiting Fresh Blood

A healthy group will have a strong recruitment plan. One group I recently visited gives a three-minute presentation in each freshman-level course at the beginning of the academic year in addition to its presence at freshman orientation week and other campus-wide efforts. Other groups set up tables in the university dining halls for both recruitment and PR purposes. Another group offers CPR and basic first aid training to resident assistants (RAs), who could be great advocates (and passive recruitment agents) of the collegiate EMS system to their residents.

If your organization has a restrictive membership process (some groups can only accept a small portion of applicants each semester), aim to keep it as transparent as possible and provide a mechanism for feedback. An applicant that did not make the cut can be one of your biggest detractors when he or she complains to friends about the "raw deal" they received.

Recruitment is only one half of the membership equation. You also have to retain your new members. Some squads have mentioned that a buddy system between new members and older ones has been successful in member retention. There are countless other ways to provide incentives to keep your members engaged.

### The Collegiate EMS Leadership Ladder

A strong collegiate EMS organization does not lead itself. Especially for groups in transition or just starting up, a lack of appropriate leadership can quickly derail

a group. Years of hard work and positive progress can be erased within a year or two if the leaders are asleep at the helm or lead ineffectively. To prevent this from happening, it is crucial that future collegiate EMS leaders are groomed and shown a path to ascend the ranks.

There are two inextricably linked aspects to leadership succession: procedures and personnel. From a procedural standpoint, aspects of regular operations should be well-documented. Without proper documentation of these processes, new leaders are left to reinvent the wheel, which severely distracts from the actual work at hand. On the flip side, having a detailed manual of policies and procedures doesn't do an organization any good unless there are qualified people to execute them. While it is not appropriate to turn the keys over to new members that have not proven themselves, the leaders would be doing the organization a disservice by leading in a vacuum. Senior leadership should offer newer members opportunities to shadow them and participate in administrative tasks. In doing so, an expectation for the level of dedication and commitment to leadership tasks needed is appropriately set.

### Show Me the Money

Funding is always a touchy subject since a group cannot operate very long without money. There is no one "right way" to approach the topic since each organization faces different challenges in their unique campus environment. While many funding models exist, I am always wary of those tied to an annual activities fee allocation. Going before a student activities board for your annual funding is risky since you will be competing with club sports and other special interest groups. Not to minimize the importance of the chess club, but I cannot imagine a budget item on their wish list that would be a life-or-death decision. Your campus EMS organization's purchase of an AED or oxygen cylinder has the real potential to save a life and should be placed in a different category.

The gold standard in funding sources is a line item in a campus administrative department's budget. It does not matter if you fall under public safety, campus health, or student life. Any of the above could be stable funding sources, and

financial stability is one key to organization longevity. You should never have to wonder how you are going to pay for your next trauma dressing or ice pack.

### Get Social

As the other three cornerstones of your organization fall into place, it is well worth the effort to establish a social program for your organization. Collegiate EMS responders have a lot of "serious" experiences that other people never have. There are few people on your campus outside of your squad who know what it feels like to perform CPR on a real person. But along with the serious side of collegiate EMS comes camaraderie. It is worthwhile to give members a constructive way to cut loose and relax. Whether it is a scheduled TV watching night, bowling outing, squad comedy night, or hanging out at a local watering hole, the squad that plays together tends to be tighter knit and more successful in the long term. But this type of social activity can be a double-edged sword if it is not inclusive. Every member, from new recruits to the senior leadership, should be invited (and actively encouraged) to attend such events.

While there is no standard recipe for a successful collegiate EMS organization, experience has shown that the four aspects mentioned above are critical for a group's ongoing success. The list is by no means exhaustive, but rather it is a launching point. From these four ideas spawn important related concepts such as public relations, quality assurance, training, and equipment.

With more than a half-century of combined collegiate EMS experience, the NCEMSF officers are available for consultation on any aspect of your organization. You can contact us through the leadership page on the NCEMSF Web site or see us in person at the conference in Washington, DC in February. Or, if my travels happen to bring me to your city or town, do not be surprised if I e-mail or call asking to drop by for a visit.



***“As an organization, we are poised to be the leaders for EMS research. Collectively, we have the knowledge, creativity, and enthusiasm to further research.” Join NCEMSF in this pursuit...***

### **About This Publication**

NCEMSF NEWS is an official publication of the National Collegiate Emergency Medical Services Foundation (NCEMSF). This newsletter is published as a service to the Foundation's members and the national EMS community.

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E-mail articles to be considered for publication to [info@ncemf.org](mailto:info@ncemf.org)

## **Resistant Bacteria and Ambulances**

Michael T. Hilton, NCEMSF National Coordinator

It has been covered widely in the popular news media and Internet and has been the subject of hospital-based scientific literature and a focus concern of The Joint Commission (JCAHO) that accredits hospitals: resistant bacteria are increasing in incidence and in environmental prevalence. Hospitals have a concentrated population at risk for the development of bacterial infections with resistant organisms due to the presence of many patients with relative immuno-deficient conditions. As well, in the hospital, there is heavy use of both common and "big-gun" antibiotics providing a breeding ground for resistant bacteria. In the outpatient setting, overuse of antibiotics (e.g. antibiotic prescription for a viral illness) and undertreatment of bacterial infections (e.g. failure of completion of a full course of a prescribed antibiotic) has led to resistant organisms outside of the hospital, such as community-acquired methicillin-resistant staphylococcus aureus (CA-MRSA; a strain of *S. aureus* resistant to many antibiotics). As an important intermediary between these two settings, do ambulances contribute to this problem? This is a difficult question to answer currently as there are few articles in the scientific literature that have addressed this question. Two articles, however, were identified by a pubmed search of varying combinations of keywords (ambulance, EMS, nosocomial, infection, contamination) that indicate that ambulances do harbor many bacteria and some strains are resistant to all but "big-gun" antibiotics.

Alves and Bissell<sup>1</sup> performed a cross-sectional study of four first-due 911 ambulances (two urban and two suburban), culturing five areas of the ambulance for bacterial growth and then performed standard microbiological identification techniques to identify the bacteria. These areas included the "in-unit oxygen flow regulator control knob, the bench seat, the communication radio, the microphone-transmit knob..., the inside door-handle of the driver's door, and the lower track of a sliding cabinet door or the lower aspect of a swinging door closest to the patient's head when lying on the stretcher." They found growth of seven bacterial species in mostly all locations of all ambulances tested. Most importantly, they identified four that are substantial nosocomial (cause of hospital-acquired infection) pathogens and three of these had "formidable antibiotics resistant patterns." Of note, all bacteria found were susceptible to the disinfecting agents "currently in common use by EMS agencies."

The purpose of this study was to serve as a

pilot study and so has numerous weaknesses and has limited external validity (ability to extract the findings to other settings including to your EMS vehicles), but does show that there is a possibility of significant bacterial contamination of EMS vehicles. Most importantly, it also indicates the ability to limit this presence by proper cleaning and disinfecting of all surfaces within the vehicle. These authors chose the specific areas to test because of their relative difficulty to clean (oxygen regulator knob and crevices on bench seat and in cabinets). These areas, of course, may harbor more bacteria than easy-to-clean surfaces. Regardless, regular cleaning and disinfecting of surfaces will aid to decrease bacterial presence in EMS vehicles and is something that you can do to help prevent the spread of these bacteria to yourselves, to patients and between the community and the hospital. As a quick review, cleaning is defined as using soap and water to remove visible contamination, or dirt. Decontamination is the removal of pathogenic microbes from equipment so that they may be touched without the ability to transmit infections. Disinfecting is the removal of many or all pathogenic microbes from surfaces. Sterilization is the irreversible destruction of microbes.

Roline, Crumpecker, and Dunn<sup>2</sup> performed a pilot cross-sectional study of an urban ambulance fleet including ALS (n=16), BLS (n=3) and Critical Care Transport (n=2), 911 and interfacility transfer ambulances from two stations (10 from one, 11 from the other). On these ambulances, they swabbed the steering wheels, left patient stretcher hand rails, patient stretcher cushions, work areas in patient compartments and Yankauer suction tips. They performed standard bacterial identification techniques for detection of MRSA. They found 10 ambulances (47.6%) to have confirmed MRSA growth. Out of 105 total samples, 13 (12.4%) were positive. The distribution was one (4.8%) positive from steering wheels, two from left patient hand rails (9.6%), two from patient stretcher cushions (9.6%), seven from work areas (33.3%) and one from Yankauer tips (4.8%). The ambulances from the two stations were similar. The authors conclude that MRSA was present in this one fleet and that the distribution may indicate that prehospital providers may disinfect the stretcher but "neglect other interior surfaces."

This study, also a pilot study, shares limitations with the previous study. It has limited external

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validity and has a small sample size (small number of ambulances tested). It was also designed only to test for MRSA. However, it is from a different geographic area than the previous study (this study being conducted in the "western" United States and the previous conducted on the east coast) and so the complimentary results, both studies indicating resistant bacteria present in ambulances, are interesting.

regular cleaning (with soap and water) and disinfecting (with these agents) of all interior surfaces will help to limit the prevalence (presence and size) of populations of resistant bacteria. By doing this, we can protect ourselves and our patients from contamination with these bacteria and possibly contribute to preventing of the spread of resistant bacteria within the healthcare system

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There is evidence that further study to definitely show the bacterial prevalence, distribution and resistance patterns on EMS vehicles is warranted and would be useful. In the mean time, we should assume that resistant bacteria, including MRSA, are present on ambulances and that ambulances contribute to some degree to the increasing incidence and spreading geographic prevalence of resistant bacteria. We should also assume that these microbes are susceptible to the disinfecting agents used by many EMS providers and that

1. Alves DW and Bissell RA, Bacterial pathogens in ambulances: results of unannounced sample collection. *Prehosp Emerg Care.* 2008 Apr-Jun;12(2):218-24. PMID: 18379921
2. Roline CE, Crumpecker C, Dunn TM. Can methicillin-resistant *Staphylococcus aureus* be found in an ambulance fleet? *Prehosp Emerg Care.* 2007 Apr-Jun;11(2):241-4. PMID: 17454817

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