

Maryland

# E·M·S

## NEWSLETTER

Vol. 19, No. 5

For All Emergency Medical Care Providers

May 1993

### **EMS Week: May 23 - 29, 1993; A Salute to All EMS Providers**

Maryland will celebrate Emergency Medical Services Week from May 23 to May 29. This year's theme is "We're Ready - Are You?" The focus will be on educating the public about accident prevention, emergency first aid, and how to access local emergency services.

In Maryland, EMS Week is a time to celebrate our tradition of excellence and system of care. But mostly it is about the thousands of the highly trained and dedicated volunteer and career personnel who make up the system— individuals ranging from first responders, EMT-As, CRTs, EMT-Ps, Med-Evac crews, SYSCOM/EMRC operators, and 911 dispatchers to emergency room, trauma center, and rehabilitation nurses, physicians, and

specialists—all working together to ensure quality treatment for the sick and injured.

Last year over 450,000 emergency ambulance calls and 4,200 Med-Evac missions occurred. Every moment of every day the EMS Team stands ready to serve.

As the Acting State EMS Director, I want to sincerely acknowledge and thank these individuals for their skills and dedication. Because of their efforts, thousands of lives have been and are being saved. It is impossible to imagine our state without the EMS team and their commitment to saving lives.

◆ *Richard L. Alcorta, MD  
Acting State EMS Director*



### **Field News**

After his first six months as Acting State EMS Director, Richard L. Alcorta, MD, discusses Maryland's EMS System and some recent changes.

**Q.** What is the current state of our trauma system?

**A.** The trauma system that much of Maryland's EMS system is based on is very intact and very functional. Trauma hospitals have been designated through an agreement called the "echelons of care" that was completed in 1978. Area-wide trauma center designation is based on the need for trauma care in the populations that the designated trauma center serves, as well as on the level of care that it delivers. The "echelons of care" also sets up a tiered approach because the Shock Trauma Center has the highest level of training and medical care within the state of Maryland. The trauma system is currently working very well.

**Q.** Are patients being transported to the appropriate facility— either a local emergency department or area-wide trauma center?

**A.** Prehospital providers are the ones making these decisions and, I think, they are doing a superb job. They make these decisions based on protocols that have been set forth by the American College of Surgeons, EMS providers (including hospitals and EMS physicians), and the Board of Physician Quality Assurance. The protocols help providers decide where

*(Continued on page 2)*



*Through the efforts of EMS providers, thousands of lives are saved each year.*

## Field News. . . Field News. . .Field News. . .Field News. . .

*(Continued from page 1)*

patients should be transported, whether to a local emergency department, areawide trauma center, university trauma center, the Shock Trauma Center, or a specialty referral center. The integrity of the process is that the prehospital provider who's at the scene and knows the extent of the patient's injuries, can then take into consideration the location, the time it will take to transport the patient, the road conditions, and the resources that are available to him and can then make the best decision about where his patient should go. And these are very dedicated individuals whose primary interest is the best care of the patient.

**Q.** How does Trauma Line fit into this?

**A.** Trauma Line is actually a statewide resource although it is used primarily in Region III, which is the Baltimore corridor. Trauma Line is a statewide resource in which Shock Trauma Center attending traumatologists answer the questions of field providers on a daily, 24-hour-a-day basis. If the field provider feels that he has a patient who needs immediate intervention, he would call directly to the Trauma Line. Now the patient does not have to go to the Shock Trauma Center; he can go to a local emergency department or to an areawide or university trauma center, depending on the types of injuries and what the prehospital provider feels is best for his patient after consultation with a physician. Trauma Line physicians can advise on interventional care and whether a patient meets trauma center criteria if there is any question. Then the determination is made by the prehospital provider based on criteria that we talked about earlier. The Trauma Line physician could recommend that the patient come to Shock Trauma but the reality is that he would not route a patient past an areawide trauma center that is capable of handling these types of injuries. The prehospital provider is also able to contact any areawide or university trauma center for consultation. This is done most commonly in the other four EMS Regions.

**Q.** There's been a lot of discussion in the press lately about fly-bys. Can you explain what a fly-by is?

**A.** Fly-bys have been highly

publicized recently and that centers around Shock Trauma's fly-bys. Every emergency department and areawide or university trauma center face the problem of fly-bys. It's not a one-institution problem. It's a system-wide process and it's addressed by the fact that Maryland has a system to deal with this issue. Patients don't drop off into an abyss if one hospital goes on fly-by. If one facility goes on fly-by, there's another facility that can pick up that patient. The trauma system is set up so that these hospitals designated as areawide or university trauma centers are prepared to handle the critically ill. The difference is that Shock Trauma is our statewide institution that is at the top of the echelons of care and people think that if they cannot get into that institution, they are being transported to an institution that is something less. But that's not correct. These other institutions deliver high quality care to the critically injured.

**Q.** What happens when any institution, such as Shock Trauma, goes on fly-by?

**A.** During the fly-by, which could last for minutes or hours depending upon what's going on, the patient will go to the next, nearest appropriate areawide or university trauma center. The patient then receives prompt, optimal care and is not put in jeopardy. That's why when any one hospital goes on fly-by or reroute, the system can pick up the load. The patient does not suffer.

**Q.** When does a hospital go on fly-by?

**A.** When a hospital goes on fly-by, it is saying that we have received a significant number of critical patients that we are in the process of managing and our system is at its maximum. That can last as long as it takes to get a single patient stabilized or taken to an operating room or to get an operating room freed up. It depends on the bottleneck at that particular hospital. A fly-by can occur in any hospital. Our system makes sure that a patient doesn't have to wait if that occurs but gets taken to an alternate trauma hospital that gives high quality care.

**Q.** When would a patient be transferred from one hospital to another?

**A.** Very seldom does a patient go initially to one institution and then get

transferred to another. But that can occur with a specialty injury. A classic example is a spinal injury. A patient has multiple gunshot wounds. The clinical team manage the bullet holes in the patient's abdomen and do the surgical repair but he also has a spinal cord injury. Once that patient is stabilized for his abdominal injuries he could then be taken to Shock Trauma, the statewide center for neurotrauma. The same could occur for a patient with a significant globe or eye injury where Johns Hopkins happens to be the eye referral center and also one of the trauma centers. Once a patient is stabilized for his trauma, the clinical team may call in an eye specialist. The third option is that a patient arrives in a local emergency department and is felt to be a trauma patient—to have more significant injuries than were originally found in the field; emergency department staff can then have that patient transported to an areawide, university, or shock trauma center.

**Q.** In the case of a mini-disaster, do we have mutual aid agreements with other states?

**A.** Maryland's system is set up with eight areawide trauma centers, a university trauma center, and the Shock Trauma Center. If, in the Baltimore-DC corridor, all trauma centers were overwhelmed by a mini- or full-blown disaster, we have agreements with hospitals in DC and outside of Maryland to accept patients from our system. We have more agreements with hospitals in Washington because that is a highly populated corridor; for example, we have agreements with Washington Hospital Center, Georgetown University Hospital, George Washington University Hospital, DC General, and Howard University Hospital to pick up the load, as well as DC Children's Hospital. All of those are resources that we are working to build rapport with when our system is overwhelmed. The aim is to get the patient to the treatment facility offering the most appropriate level of care. We're also looking at other facilities such as Morgantown and York Hospital to develop relations to improve patient care for the citizens of Maryland and the immediate area.

**Q.** If the four areawide trauma centers in Region III were overwhelmed, where would the patient then go?

## Field News. . . Field News. . .Field News. . .Field News. .

**A.** The patient would go to the next nearest state areawide trauma center; that could be Prince George's, Suburban, Peninsula General, or Washington County hospital. They are prepared to handle trauma patients. There could be a few minutes delay, but it's better than landing at a hospital that cannot take care of the patient at that time.

**Q.** How does the red, yellow, and blue alert system fit into all of this?

**A.** In Region III (that is Baltimore City and the five surrounding counties), agreements have been made with the local hospitals, emergency and fire personnel, and regional EMS councils to develop a bypass or fly-by or reroute system. The reason is that there are hospitals that can be overwhelmed either in their emergency department, intensive care unit, or coronary care unit. If a patient were to arrive in their emergency department, there would be a delay in patient care because their system or services were overwhelmed. To address this issue, the regional council devised a color system that is managed by the hospitals and local fire departments. So a hospital would actually put itself on a red or yellow alert. The fire service would go on a blue alert if the environmental conditions meant that an ambulance couldn't go very far or very fast and needed to override the existing codes (for example, during the recent blizzard).

Now let's discuss the various colors. If an emergency department were overwhelmed with critical patients and could not handle the influx of critical patients without a delay in patient care, they would call the Emergency Medical Resources Center (EMRC) and ask to be placed on yellow alert and that could last from minutes to hours. When ambulance personnel call EMRC and say that they are enroute to that hospital, EMRC tells them that hospital is on yellow alert. The prehospital care providers would then decide which hospital is the next closest, appropriate treatment facility and EMRC would connect them to that facility for consultation and information. That is where the patient will go, and the hospital on yellow alert will be bypassed.

A red alert is called when a

coronary care unit is completely full and cannot handle any more coronary patients. If the patient in the ambulance is having a heart attack, EMRC will notify the medic that he has to take the patient to the next nearest facility.

**Q.** What happens if you have two hospitals in sequence that are on either red or yellow alert?

**A.** If that happens, both alerts are negated and the patient goes to the nearest hospital. He doesn't go bouncing all over town. The hospital does the best it can. It can activate its own internal disaster plan. It may mean calling in extra physicians, nurses, and staff. A mini-disaster is usually activated when the physical plant of a hospital has a malfunction--such as loss of water, oxygen capability, or total electrical power--and hospital staff cannot manage patients or when the hospital is so overwhelmed by patients that calling in extra staff will not help. Once a hospital goes on mini-disaster, no patients go into that hospital until the environmental emergency or the system emergency is resolved, with the exception of the critical priority one patient, such as the patient in cardiac arrest.

It's basically a system of checks and balances that's in the best interest of the patient so that he gets to the nearest facility that can best handle his medical case, whether cardiac or respiratory, so that he doesn't wait in the emergency department and not receive care.

**Q.** What impact will the new leadership at MIEMSS have on the field programs?

**A.** John Ashworth and I have recently discussed this topic. He feels that the initiatives undertaken this past year through the EMS Field Operations are sound and medically practical, and feels that we need to move forward with them. He has told the fire councils and EMS community that he supports my position as well as the programs that are being implemented in the prehospital arena. How or if these programs will be affected by the legislation that is pending as we go to press is unclear at this point. But Mr. Ashworth thinks that the recent addition of the endotracheal intubation module to the CRT program is essential and will save hundreds of lives.

The next area of recent improvements are the "options" that have recently been added to the Maryland EMT-P level of certification. These options are needle decompression, thoracostomy, intraosseous infusion for the critically ill child, external pacing for the symptomatic bradycardiac patient, the medication nifedipine for the hypertensive crisis, and glucagon for the hypoglycemic diabetic patient who has no IV access. Mr. Ashworth feels we made great strides by ensuring that these options are available for patient care.

At the EMT-A level, the airway adjunct enhancement workshop is, according to Mr. Ashworth, a resource that has long been overdue for the state of Maryland.

John Ashworth has made it very clear that he doesn't want the EMS system to slip backwards and he is supporting these programs that we just discussed as well as the programs being developed now. One rumor that I've heard is that the EOA will be coming back. That simply is not true. The EOA is being phased out as prehospital providers become certified in ET intubation -- which is the "gold standard."

**Q.** What's new in the Pediatric Program?

**A.** Unfortunately, prehospital pediatric care is one of the weakest links in our EMS system. Although providers are trained in pediatric care, they often have anxious feelings when managing an infant or small child--because kids are different and not just small adults. We are in the process of designing a network of regional pediatric resource physicians--similar to our regional medical directors' group--to coordinate and review pediatric protocols, so we can improve the quality of care in this area. This is only one of the things we're looking at. Dr. Alex Haller is highly motivated and has a vision of what the Maryland EMS System could become with an added focus on children. (*Editor's Note: Articles on Dr. Haller and on Pediatrics in EMS will appear in the next newsletter.*)

## Intraosseous Infusion

*Editor's Note: Intraosseous infusion for the critically ill child was recently approved as an "option" for EMT-Ps by the Board of Physician Quality Assurance.*

Intraosseous infusions have been used by emergency physicians and pediatricians for more than 40 years in the resuscitation of infants and young children with life-threatening illnesses, such as overwhelming septic shock, status epilepticus, sudden infant death syndrome, etc. Because surgeons who traditionally care for patients with life-threatening trauma have not been taught the technique of intraosseous infusion, this means of intravascular access rarely has been used to resuscitate a child with major injuries, such as hypovolemic shock. In the 1980s, experimental and clinical experiences have demonstrated the effectiveness of this once "pediatric" technique in treating injured children. Now all courses in

trauma resuscitation are recommending intraosseous infusion as an optional method of fluid and drug resuscitation for hypovolemic shock; these include the Pediatric Advanced Life Support course of the American Heart Association, the Advanced Pediatric Life Support course of the American Association of Pediatrics and the American College of Emergency Physicians, and the Advanced Trauma Life Support course of the American College of Surgeons.

The Committee on Pediatric Emergency Medicine of the American Academy of Pediatrics recently issued a statement which is a comprehensive review of the current status of intraosseous infusion for infants and young children. (See article below).

◆ *J. Alex Haller, MD*  
Associate EMS Medical  
Director for Children's  
Programs

### Introduction

Vascular access in seriously ill and injured infants and young children can be the most time-consuming part of resuscitation. Failure to establish an IV line rapidly can lead to unacceptable delay in administering potentially lifesaving fluids and medications (1). In up to 25 percent of cases of cardiopulmonary arrest, the time to establish vascular access may be longer than 10 minutes, and in 6 percent of cases, establishing vascular access may not be possible (2). While resuscitation drugs such as atropine, epinephrine, lidocaine, and naloxone may be given via the endotracheal route, hypertonic solutions and volume expanders cannot be administered via this route. Thus, intraosseous infusion (IOI) becomes a lifesaving alternative to IV infusion when resuscitation must proceed immediately. The technique is easily mastered and has been described thoroughly in numerous reviews (3-8).

### History of Intraosseous Infusion

IOI was first described in the 1940s as an accessible route for the administration of fluids, blood, serum, and drugs to seriously ill children (9-12). Thousands of pediatric cases were reported in which the success rate for

establishing access was high, and the complication rate was low. With the advent of disposable steel needles and plastic catheters in the 1950s, IOI was used less often (8). A resurgence of interest in the technique developed in the 1980s, as its utility in the resuscitation of very young children was once again appreciated.

### Utility & Limitations of Intraosseous Infusion

Over the past 10 years, numerous reports have been published regarding IOI in clinical and laboratory settings. Successful placement of intraosseous (IO) lines has been reported in both prehospital and hospital resuscitation of children in full cardiopulmonary arrest, as well as those critically ill and injured. IOI of resuscitation drugs, antibiotics, anticonvulsants, and continuous infusion of vasopressors or crystalloid solutions have been successful (13-19). Experimental models have demonstrated rapid absorption of resuscitation drugs into the systemic circulation from the tibial marrow space, which acts as a "noncollapsible vein," even in hypotensive subjects or those undergoing CPR (20-22). IOI of crystalloid solutions at flow rates of up to 2.4 L/h have been reported in experimental models when a pressure bag inflated to 300 mm Hg was used

(20,23).

Limitations of IOI include flow rates that do not approximate those of an IV line of similar caliber, which may limit the utility of the technique in cases of severe shock or exsanguinating hemorrhage (23). In addition, IO lines cannot be placed in a recently fractured bone (4,23). The replacement of red marrow by fat in the long bones limits the use of IOI in the tibia or femur of children older than 5 or 6 years of age (4,24).

There are few complications associated with IOI (8). Subcutaneous or subperiosteal infiltration of fluid, or leakage of fluid from the puncture site are the most common complications of this technique (4). Osteomyelitis was reported in less than 1 percent of cases, and occurred only in association with prolonged infusion or bacteremia (8). No cases of fat embolism have been reported, nor have there been reports of negative lasting effects on the bone, growth plate, or marrow elements (4,8,25).

### Recommendations

1. Attention to ensuring adequate oxygenation and ventilation should precede any attempt to establish vascular access, in all resuscitations.
2. IOI should be reserved for use in situations where immediate vascular access is needed, and peripheral or central venous access cannot be established rapidly, such as in cases of shock, status epilepticus, or any form of cardiac arrest.
3. IOI can be used in both the prehospital setting (ground and aeromedical transport) and in the emergency department.
4. In most cases, peripheral venous access should be attempted before placement of an IO line, although the duration of such efforts should be no longer than several minutes.
5. In the case of full cardiopulmonary arrest, it may be appropriate to insert an IO line as the first attempt at vascular access.
6. Once IOI is underway, ongoing attempts should be made to establish peripheral or central venous access. The IO needle should be removed when functional IV lines are in place, and the patient is medically stable.

## Intraosseous Infusion (Continued)

### Summary

IOI is a safe, rapid, and reliable alternative to intravenous access in the critically ill or injured infant or young child. Delays in achieving vascular access are common in this population, and failure to promptly administer potentially lifesaving fluids and drugs may compromise resuscitation efforts. While American Heart Association guidelines describe use of the technique in children up to 6 years of age (24), it will have its greatest efficacy in very young children in whom establishing vascular access is especially difficult.

Every physician caring for infants and small children should become educated in the indications, contraindications, risks, potential sites of insertion of IO lines, and techniques of IOI. Pediatricians and other physicians concerned with child health should actively promote the use of IOI in prehospital and emergency care protocols and training programs.

### Committee on Pediatric Emergency Medicine, 1991-1992

Stephen Ludwig, MD, Chairman  
J. Alexander Haller, Jr., MD  
Marc L. Holbrook, MD  
Jane Knapp, MD  
William J. Lewander, MD  
James S. Seidel, MD, PhD  
Calvin C.J. Sia, MD  
Jonathan Singer, MD  
Joseph A. Weinberg, MD

### Liaison Representatives

Max L. Ramenofsky, MD  
American College of Surgeons  
Robert W. Schafermeyer, MD  
American College of Emergency Physicians

### AAP Section Liaisons

Daniel Notterman, MD  
Section on Critical Care  
James O'Neill, MD  
Section on Surgery

### Consultant

Dena R. Brownstein, MD

### Bibliography

- Orlowski JP. My kingdom for an intravenous line. *Am J Dis Child*. 1984;138:803 Editorial
- Rossetti V, Thompson BM, Aprahamian C, et al. Difficulty and delay in intravascular access in pediatric arrests. *Ann Emerg Med*. 1984;14:406 Abstract
- Brownstein DR, Wilbert D. Intraosseous infusion in infants and young children [training videotape]. *Washington EMS for Children*. Seattle, Wa;1988
- Fiser DH. Intraosseous infusion: *New Eng J Med*. 1990;322:1579-1581
- Hodge D. Intraosseous infusions: a

- review. Pediatr Emerg Care*. 1985; 1:215-218
- Iserson KV, Criss E. Intraosseous infusions: a usable technique. *Am J Emerg Med*. 1986;4:540-542
- Parrish GA, Turkewitz D, Skindzielewski JJ. Intraosseous infusions in the emergency department. *Am J Emerg Med*. 1986;4:59-63
- Rossetti VA, Thompson BM, Miller J, et al. Intraosseous infusion: an alternative route of pediatric intravascular access. *Ann Emerg Med*. 1985; 14:885-888
- Arbeiter HI, Greengard J. Tibial bone marrow infusions in infancy. *J Pediatr*. 1944;25:1-12
- Heinild S, Sondergaard T, Tudvad F. Bone marrow infusion in childhood: experiences from a thousand infusions. *J Pediatr*. 1947;30:400-412
- Meola F. Bone marrow infusions as a routine procedure in children. *J Pediatr*. 1944;25:13-16
- Tocantins LM, O'Neill JF, Jones HW. Infusions of blood and other fluids via the bone marrow: application in pediatrics. *JAMA*. 1941;1117:1229-1234
- Berg RA. Emergency infusion of catecholamines into bone marrow. *Am J Dis Child*. 1984; 138:810-811
- Glaeser PW, Losek JD. Emergency intraosseous infusions in children. *Am J Emerg Med*. 1986;4:34-36
- McNamara RM, Spivey WH, Unger HD, et al. Emergency applications of intraosseous infusion. *J Emerg Med*. 1987;5:97-101
- McNamara RM, Spivey WH, Sussman C. Pediatric resuscitation without an intravenous line. *Am J Emerg Med*. 1986;4:31-33
- Zimmerman JJ, Coyne M, Logsdon M. Implementation of intraosseous infusion technique by aeromedical transport programs. *J Trauma*. 1989;29:687-689
- Smith RJ, Keseg DP, Manley LK, et al. Intraosseous infusions by prehospital personnel in critically ill pediatric patients. *Ann Emerg Med*. 1988;17:491-495
- Walsh-Kelly CM, Berens RJ, Glaeser PW, et al. Intraosseous infusion of phenytoin. *Am J Emerg Med*. 1986;4:523-524
- Shoor PM, Berryhill RE, Benumof JL. Intraosseous infusion: pressure-flow relationship and pharmacokinetics. *J Trauma*. 1979;19:772-774
- Spivey WH, Lathers CM, Malone DR. Comparison of intraosseous, central, and peripheral routes of sodium bicarbonate administration during CPR in pigs. *Ann Emerg Med*. 1985;14:1135-1140
- Thompson BM, Rossetti V, Miller J, et al. Intraosseous administration of sodium bicarbonate: an effective means of pH normalization in the canine model. *Ann Emerg Med*. 1984;13:405
- Hodge D, Delgado-Paredes C, Fleisher G. Intraosseous infusion flow rates in hypovolemic "pediatric" dogs. *Ann Emerg Med*. 1987;16:305-307
- Seidel JS, Burkett DL. *Instructor's Manual for Pediatric Advanced Life Support*. Dallas, TX: American Heart Association; 1988
- Spivey WH, Unger HD, McNamara RM. The effect of intraosseous sodium bicarbonate on bone in swine. *Ann Emerg Med*.

1987;16:773-776

The recommendations in this publication do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

Reprinted from AAP News, March 1992.

## Actronics System Available for ETI

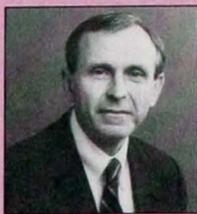
The Regional Medical Directors and the Maryland State Board for Physician Quality Assurance have approved the use of the Actronics CPR/ACLS Learning System as an alternative means by which students may gain their two successful intubations required for certification. As recently reported, the requirements for endotracheal intubation (ETI) certification were recently revised to include two successful intubations on any combination of live anesthetized patients in an operating room setting, cadavers at the State Anatomy Board, or recently deceased patients in a hospital setting. The Actronics system will become a fourth source if none of the other three options is available.

MIEMSS has leased two complete CPR/ACLS systems through a cooperative agreement with Actronics, Inc. for one year. These units will be available for use in ETI training throughout the state. Although details are not yet complete, the MIEMSS Regional Offices will be responsible for scheduling the two Actronics CPR/ACLS systems and familiarizing instructors with them. Contact your Regional Office to arrange to borrow the Actronics CPR/ACLS system.

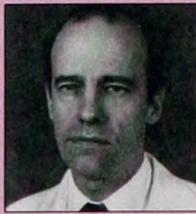
Advanced life support programs wishing to use the Actronics system as an alternative means for certification must have their training program approved by the State EMS Director. Such requests for approval should include documentation of efforts to comply with the ETI training program requirements without the use of the Actronics system. Once authorized to perform ETI, providers should be encouraged to perform their first field intubation with another experienced provider present. Persons responsible for quality assurance should monitor the success rates of all providers and ensure that newly certified individuals feel comfortable with their new skill.

## Perspectives on the Consolidation of Shock Trauma. . .

*Editor's Note: The questions below are based on concerns voiced by prehospital care providers about the consolidation of the Shock Trauma Center and the University of Maryland Areawide Trauma Center. John W. Ashworth III and David Gens, MD, agreed to discuss these concerns from their perspectives as administrator and attending traumatologist, respectively. Mr. Ashworth, recently named interim director of MIEMSS, was one of the principal "architects" of the certificate-of-need for the R Adams Cowley Shock Trauma Center and an*



**John Ashworth**



**David Gens, MD**

*administrator for 18 years at MIEMSS before he left in 1988 to accept a position at the University of Maryland Medical System. Dr. Gens has been an attending traumatologist at the Shock Trauma Center since 1983.*

**Q.** The consolidation of the Shock Trauma Center and the University of Maryland Areawide Trauma Center was certainly not a spur-of-the-moment decision. What prompted it?

**A.** ASHWORTH: The new Shock Trauma Center building, which opened in 1989, was designed, built, and staffed to be a comprehensive trauma service with a mission to care for five patient "populations." At that time (and currently) the Shock Trauma Center served as a statewide referral center for patients with (1) severe spinal cord injuries; (2) severe head injuries; and (3) extremely severe multisystem trauma injuries. It also served as an areawide trauma center for trauma patients in the Baltimore Metropolitan area outside of the beltway. (This was the "fourth population.") In the mid-1980s during discussions with legislators in Annapolis about the proposed new building and the mission of Shock Trauma, a fifth "population" was added—the severe and potentially severe trauma patients from Baltimore City that were at that time being taken to the University of Maryland Areawide Trauma Center.

A study was done and the building was designed or "sized" to meet the needs of those five patient "populations," with the proper number of beds and staff to manage the expected number of injured patients. (The new Shock Trauma building has 10 admitting bays, 6 dedicated operating rooms, and 138 licensed beds.) So the consolidation of trauma centers is actually an "old" idea, going back to the mid-1980s.

**Q.** Why, in your opinion, was the

"fifth population" [noted above] added to Shock Trauma's mission?

**A.** ASHWORTH: Enhancing the efficiency of trauma services without diminishing quality was at the core of the issue. Prior to the trauma center consolidation, there were two level-one trauma centers sitting within 100 yards of each other, both part of the same University of Maryland Medical System—that is, (1) the trauma center entered through University of Maryland Hospital's Emergency Department and (2) the one entered through the MIEMSS Shock Trauma Center. It seemed logical to treat all trauma patients coming to the same medical center in the one new facility. So the new building was designed with the necessary capacity to receive the trauma patients that would previously have gone to the University of Maryland Areawide Trauma Center through the Hospital's Emergency Department.

GENS: Another reason, I think, was the fact that many trauma and EMS specialists foresaw the impact of public education as eventually (in 6-10 years) reducing the number of severe injuries and fatalities caused by vehicular crashes. And, in fact, we have already begun to see that at the Shock Trauma Center. Blunt trauma often means less serious injuries than we received 10 years ago because of air bags and the increasing use of seat belts and primarily, I think, because there is less drinking and driving. We are finally seeing the effects of public education that appeared on TV, the radio, and in the schools regarding drinking and driving. Six years ago, the kids who were 10 years old were aware of this publicity;

now they're teenagers and driving and making sure they have a designated driver on prom night or when they're drinking. You don't see the effects of public education immediately. It takes time. Kids now automatically put seat belts on; you don't have to remind them.

**Q.** So part of the impact of consolidation has been that we are seeing more penetrating trauma, as well as the blunt trauma that we saw prior to consolidation. Do all of the patients with gunshot wounds belong in a trauma center or could they be more appropriately handled by an emergency department?

**A.** GENS: I wouldn't call any patient inappropriate. Most of the patients you are referring to are what you would call "rule outs." For example, when a patient is shot through the leg, a medic has to take him to a trauma center to rule out a vascular injury. We might spend hours ruling out such injuries by angiograms or other studies. Some of these patients do leave early but I wouldn't call them inappropriate patients, because we are ruling out potentially lethal or extremely debilitating injuries that could be caused by the initial injury. I think "inappropriate" patient is an inappropriate term.

**Q.** Would you explain "rule outs" more fully?

**A.** GENS: You bring someone in to "rule out" an injury. And I'll give you an example—appendectomy. It's said that about 10-12 percent of appendectomies are done when faced with a normal appendix. That's good. It's a rule-out appendicitis. The surgeon thought the patient had appendicitis and he didn't. If you tighten it to 0 percent—you don't want to make any errors in doing an unnecessary appendectomy—you may miss one and you risk a very sick patient because you didn't bring him to the hospital. So you have rule-out appendectomies. And it's the same in trauma and other surgical diseases but the rule-out rate may be higher—as high as 20-25 percent. This is especially true of penetrating trauma, such as a bullet wound.

In penetrating trauma, you see several wounds. But the bullet doesn't always hit a blood vessel or a nerve. The patient must be brought to a trauma center to rule out major injuries, such as vascular injuries. Now in blunt trauma it's a little

## . . . and University of Maryland Areawide Trauma Center

more difficult because you don't have the obvious visual evidence of injury; but a patient with left upper quadrant pain might have a ruptured spleen and it has to be ruled out. Another example is neck pain. It takes us an hour or two to determine through x-rays and special imaging if the neck is broken. How do you expect a paramedic in the field to do that? This is why it's difficult for a paramedic to know with certainty who has an injury that should be brought to a trauma center. If you try to tighten that rule-out rate to 0, you're going to send some very sick patients to local emergency rooms that aren't equipped to deal with severe trauma and shouldn't deal with it.

**Q.** Can we go into a little more detail about how the "rule-outs" affect the average length of stay of a patient?

**A.** ASHWORTH: Certainly "ruling out" severe penetrating trauma can be done more quickly than ruling out severe damage caused by blunt trauma, due to the difficulty that Dr. Gens mentioned. Some patients with penetrating trauma are discharged within 8 hours of their admission; many, within 24 hours. This has the impact of reducing aggregate length of stay. However, in general, length of stay at the Shock Trauma Center has declined since the opening of the new building in 1989. This could be partly due to better equipment, improved medical techniques, and rapid access to and coordination with post-hospital facilities that we have developed, such as our rehabilitation programs at Montebello Rehabilitation Center. We are currently studying the length of stay issue.

**Q.** Who determines which patients come to the Shock Trauma Center?

**A.** GENS: That is purely a field education issue. We rely on EMT-As, CRTs, and paramedics to bring patients to trauma centers. They base their decisions on protocols, vital signs, what they see and feel, and in the case of car crashes, the destruction of the car and type of injury. But it's their decision. The "guts" of a trauma system is the education of the field providers to bring patients to the right place. And I think they're doing a tremendous job. They might consult with us on the radio, but if a patient is sick and 30 minutes from us and 5 minutes from another trauma center, he goes to the other trauma center. We stick to protocols. All of the

patients with severe head or spinal-cord injuries are supposed to come here.

**Q.** Has the consolidation of trauma centers increased the patient load to the point that critically injured or ill patients have been turned away because less seriously injured patients are occupying Shock Trauma beds?

**A.** GENS: The number of beds available for seriously injured patients has not decreased since the consolidation. The question is more "are we turning people away from our admitting area since the consolidation?" That happened a few times last July before we had a process working smoothly for good patient flow in the admitting area; now we often put less seriously injured patients in the recovery area if beds are needed in the admitting area. And the nurse coordinators do a great job of properly moving patients along in the system. Last July we did have a problem with fly-bys, but now we might have one or two fly-bys a month, similar to what we had in past years. But it's more a question of getting inundated with many patients at the same time. It has nothing to do with the consolidation. I think the flow of patients is working very well, thanks to the nurses.

**Q.** We talked at length about the Shock Trauma Center since the consolidation last July. What about University Hospital's Emergency Department that used to be the "entrance" for the University of Maryland Areawide Trauma Center?

**A.** ASHWORTH: The University of Maryland Hospital Emergency Department continues as an open and active full-service emergency program. In fact, there are actually two distinct emergency departments—the adult emergency department and the pediatric emergency department, which annually treat approximately 40,000 and 20,000 patients, respectively. The adult emergency department continues to provide comprehensive emergency care. Following recent \$1 million renovations, the adult emergency department opened a "fast track" emergency care area for less seriously injured patients; new ambulance and walk-in entrances; and new medical resuscitation, waiting, registration, diagnostic imaging, and triage areas. A new 4-bed chest pain unit also just opened; here patients with chest pain, who may or may not be having a heart

attack, can be evaluated and treated for cardiac disease if necessary.

**Q.** In summary, how would you evaluate the recent consolidation?

**A.** GENS: I think it was the right action to take, and most of the problems have been worked out.

**A.** ASHWORTH: We're finally fulfilling our mission as defined by the legislature almost 10 years ago. And the center is serving all the citizens of Maryland who might need its services.

## New Pediatric Nurse Coordinator Named

Cynthia (Cyndy) Wright recently was named state Pediatric Nurse Coordinator for the Department of EMS Nursing and Specialty Care at MIEMSS. She will facilitate the pediatric training and prevention programs for emergency department and PICU nurses and prehospital care providers. She also works closely with Alex Haller, MD, the MIEMSS associate EMS medical director for children's programs, to develop and implement EMSC (Emergency Medical Services for Children) initiatives in Maryland.

Ms. Wright came to MIEMSS from the Children's National Medical Center in D.C., where she was the trauma rehabilitation coordinator. She received her MSN degree from the University of Maryland and completed a fellowship in developmental disabilities and rehabilitation at the then Kennedy Institute (now Kennedy Krieger Institute) in Baltimore. (The fellowship was funded through Maternal Child Health/Department of Health and Human Services.)

Ms. Wright has served as the chairperson of the Rehabilitation Work Group of 28 states receiving grant funds for the EMSC from Maternal Child Health/Department of Health and Human Services. She continues to be active in EMSC through the National Resource Center (NRC) and National Emergency Resource Alliance (NERA) as a consultant on issues for children and families with special health care needs. Ms. Wright is involved with the local and national SAFE KIDS programs which focus on injury prevention.



Six Issues Published Annually  
Copyright© 1993 by the

**Maryland Institute  
for  
Emergency Medical Services Systems**

**University of Maryland at Baltimore  
22 S. Greene St., Baltimore, MD 21201-1595**

*Interim MIEMSS Director:* John W. Ashworth III  
*Acting State EMS Director:* Richard L. Alcorta, MD  
*Managing Editor:* Beverly Sopp (410-706-3248)

**Address Correction Requested  
MIEMSS, Maryland EMS Newsletter,  
22 S. Greene St., Baltimore, MD 21201-1595**

**DATED MATERIAL**

## **New Leadership Team at MIEMSS**

**John W. Ashworth III was recently appointed interim director of MIEMSS, overseeing the R Adams Cowley Shock Trauma Center and the State EMS System.**

Mr. Ashworth also serves as the senior vice president of strategic planning at the University of Maryland Medical System (UMMS). He worked at MIEMSS for 18 years, including 8 years in the position of executive director.

Mr. Ashworth has put together the following leadership team:

**Howard M. Eisenberg, MD, FACS, Director of Shock Trauma Medical Services.** Dr. Eisenberg also serves as chief of the division of neurosurgery and professor of surgery at the University of Maryland Medical Center, as well as head of neurotrauma within the Shock Trauma Center. He has held these positions since January 1993. Prior to that, he was at the University of Texas Medical Branch in Galveston, where he was chief of neurological surgery.

**Philip R. Militello, MD, FACS, Deputy Director of Shock Trauma Medical Services.** Dr. Militello has been an attending traumatologist at MIEMSS since 1979. He has previously served as clinical director, director of surgery/traumatology, and as president of the medical staff of UMMS.

**Angela M. Janik, Director of Nursing Programs.** Ms. Janik has directed the Shock Trauma and field nursing programs since 1990. She was

previously director of critical care nursing and department chairman of neuroscience nursing at the Cleveland Clinic Foundation, a position she held for five years.

**James E. Ross, Director of Operations and Finance.** Mr. Ross is also President and Chief Executive Officer of the Montebello Rehabilitation Hospital to which many Shock Trauma and UMMS patients are discharged for additional care. Previously, he was vice-president at St. Joseph's Hospital in Lancaster, PA, and he was an administrator at Shock Trauma in both clinical affairs and ancillary and general services.

**Richard L. Alcorta, MD, FACEP, Acting State EMS Director.** Dr. Alcorta has been acting state EMS director since August 27, 1992 and is well known to many EMS providers throughout the state. He previously served as chairman of the EMS Committee for ACEP and chairman of Region V EMS Advisory Council. He is also an emergency room physician at Suburban Hospital. He has been an active prehospital instructor at Montgomery County Training Academy and across the state.

**Brad M. Cushing, MD, FACS, Acting Director of the National Study Center.** Dr. Cushing will direct interdisciplinary research programs aimed at reducing death and disability from trauma and sudden illness. Dr. Cushing is also a trauma surgeon at the

Shock Trauma Center and an assistant professor in the department of surgery at the University of Maryland School of Medicine.

**James N. Eastham, ScD, Director of Emergency Health Services at the University of Maryland, Baltimore County (UMBC).** The EHS bachelor's and master's degree programs prepare students for a variety of leadership positions in emergency health services.

**John M. Murphy, Special Assistant to the MIEMSS Director.** Mr. Murphy has been with MIEMSS since 1983 and has worked with EMS providers since 1970.

"We have an excellent team in place," says Mr. Ashworth. "Each member is highly respected in his or her field, and we are committed to working together to ensure that patients continue to receive the highest quality of care."

"Our top priority will be to listen to the concerns and suggestions of the many people who are a part of the Shock Trauma Center and the Emergency Medical Services System. As a team, we will move forward, making the best decisions we can for EMS and Shock Trauma."

"At the center of all our decision will be our commitment to fulfilling the obligations that come with being the finest system of emergency medical services in the country and the premier trauma center in the world."