

State of Maryland EMS News

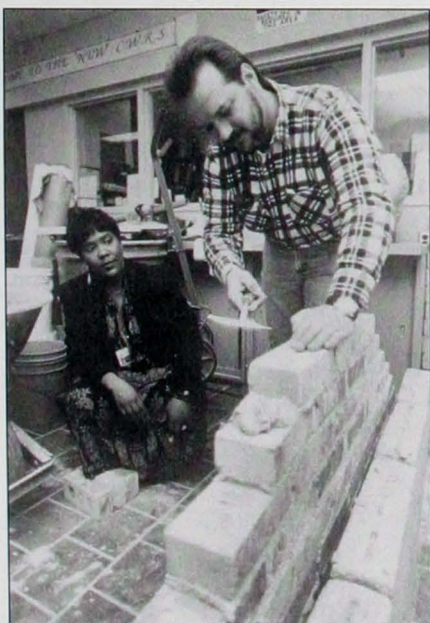
Governor William Donald Schaefer

Vol. 20, No. 6 For All Emergency Medical Care Providers April/May 1994

Hand Center: Patient Care, Training, Research

Walking inside the Raymond M. Curtis Hand Center at the Union Memorial Hospital, one might see someone putting up a dry wall or painstakingly building a brick wall. At first glance, that might not seem unusual. However, the work is done under the scrutiny of a hand therapist, and the workers are participating in the Hand Center's work rehabilitation program after recovering from hand surgery. When they complete their therapy, both they and the hand therapists will feel confident that they will be able to function well in their former jobs, work a normal workday without undue stress, and match the skills of any other dry wall mechanic or bricklayer in the open job market.

Since its designation by MIEMSS as



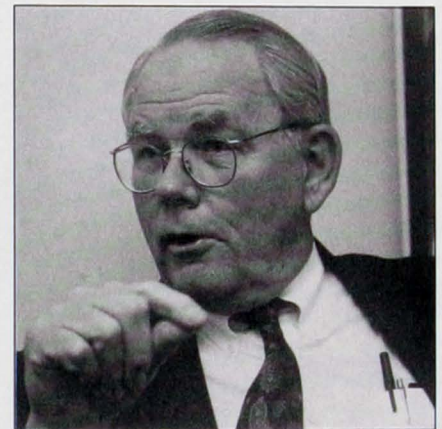
In the Curtis Work Rehabilitation Center, hand therapist Anita Pinkney-Sears checks the work of bricklayer Charles Miller who was operated on for carpal tunnel syndrome and epicondylitis of the elbow.

a specialty referral center for extremity trauma in 1975, the Hand Center, consisting of surgery, rehabilitation, training/teaching, and research components, has always stressed the total care of the hand patient. But certainly there have been advances in each of these areas during the past 19 years, and we asked E.F. Shaw Wilgis, MD, director of the Hand Center, to highlight some of them.

When they think of the Hand Center, most prehospital care providers probably call to mind patients with complete or incomplete amputations, or with degloving, crushing, or devascularization injuries—that is, hand or extremity trauma. And they probably recall the protocols for transporting completely severed hands or fingers so that they can be replanted within several hours.

Dr. Wilgis compliments prehospital providers on their skill and judgment in assessing and providing emergency care for patients with major upper extremity and lower extremity trauma. He recalls a recent case that was "beautifully handled. A man had a steel beam come down on both arms, essentially amputating them. He was picked up by helicopter, brought in, evaluated, and we were able to start working on him one hour after injury and reattach both his arms." Dr. Wilgis emphasizes, however, that the time element in transporting a person with extremity trauma to the Hand Center is not as critical as it is for major or multiple system trauma. Life obviously comes before limb. And if a severed part is properly chilled and "packaged," it could be reattached up to 12 hours after injury, after the patient has been stabilized.

But extremity trauma is only a small part of the injuries treated at the Hand



Dr. E.F. Shaw Wilgis, director of the Hand Center. Dr. Wilgis will be part of a three-person team from the Hand Center traveling to Guyana (a third-world country in South America) in April as part of Project Dawn. During the 10-day visit, Dr. Wilgis expects the team to see 300 patients and perform about 30 operations, including hand surgery on the president of Guyana.

Center. According to Dr. Wilgis, approximately 3,000 operations a year are performed at the Hand Center; of these, about 500 are for trauma. (Most of the extremity injuries treated at the Hand Center are caused by power tools such as saws, hedge clippers, and lawn mowers, and most occur at home.)

The majority of patients treated at the Hand Center are from Maryland, with every county represented. Others come from out of state, especially from southern Pennsylvania, Delaware, and West Virginia. Patients from Israel, South America, and Bermuda have also been treated at the Hand Center. Today, more patients are treated as outpatients. Of the 3,000 operations performed during a year, approximately 2,000 are outpatient surgeries.

(Continued on page 2)

Hand Center: Patient Care, Training, Research

(Continued from page 1)

Citing one benefit of having a hand center with a high volume of patients and a staff with a central focus on and extensive experience in treating hand injuries, Dr. Wilgis recalls a recent study that indicated that the Hand Center "treats patients at about 70% of the state's average cost per hospital admission. That's quality, cost-effective treatment. And that's significant."

There are only 3 or 4 hand centers across the nation that are similar to the one at Union Memorial (that is, they have the same components and see a similar volume of patients). The national reputation of the Baltimore Hand Center has always been strong, and since its beginning has drawn physicians and therapists to train there. Currently, the Hand Center trains three physician post-graduate fellows, a fellow from the Walter Reed Army Hospital, and residents in plastic and orthopedic surgeries from Johns Hopkins Hospital, in general and orthopedic surgeries from Union Memorial Hospital, and in plastic surgery



Dr. E.F. Shaw Wilgis, director of the Hand Center, operates on a patient with carpal tunnel syndrome.

from Georgetown Hospital. Since 1990, the Hand Center has been certified for fellowship training. Therapy students and visiting therapists also often train at the Hand Center, where each of its 13 staff therapists is a certified hand therapist (only recently has hand therapy become a certified specialty).



Hand therapist Dale Eckhaus checks range of motion in the finger of a patient.

Less than 20% of the hand surgery performed at Union Memorial is for hand trauma; the majority of operations are reconstructive surgery for arthritis, congenital differences, or cumulative stress trauma (overuse syndrome). According to Dr. Wilgis, microsurgery has continued to progress. "We've become more facile and creative so that we can shift almost any tissue with its functioning structures (not only skin, but muscle, tendon, and bone) from one part of the body to another. If a muscle group is destroyed, another muscle group can be moved to replace it, so that function can be restored in a one-step operation."

The major advance in other surgical techniques, as noted by Dr. Wilgis, has been arthroscopic surgery (a non-invasive technique) used in the diagnosis and treatment of such conditions as ruptured ligaments and carpal tunnel syndrome.

Following initial surgery, the patient begins therapy. At the Hand Center, there are three phases of rehabilitation, with different therapists involved in each phase. Dr. Wilgis describes the first phase as "getting the wounds to heal and the hands to work. Once you have a functioning hand, you begin the second phase—studying the patient's job and getting the hand to do the job or modifying the job so the hand can do it. This is called work adjustment or work rehabilitation. If you can't get the hand to do the patient's job even after you modify it, then you go into the third phase—

vocational rehabilitation, where you evaluate what work is possible for the patient. This involves testing and retraining."

During the past five years, hand therapists not only are working with patients but frequently participating in work programs at individual companies. The emphasis is on solving or preventing a specific problem. For example, at the company's invitation, a hand therapist or team will go to the workplace, examine the work area, and then suggest changes to prevent problems that would cause hand injuries. In one example recalled by Dr. Wilgis, a company had many employees undergoing operations for carpal tunnel syndrome. Hand Center therapists suggested changing the way the work was performed. The result was dramatic—one year the company had 150 employees undergo operations; the next year, after the therapists' suggestions were implemented, there were 10.

As the word spreads, some companies are even asking Hand Center therapists to consult with them in the design of new tools to help prevent injuries when the tool is used.

In addition to patient care and teaching, research is a primary focus at the Hand Center. In the microsurgical lab, research is continuing in basic nerve regeneration techniques to try to understand and enhance nerve regeneration. Ways to refine reconstructive surgical techniques are also studied. Other ongoing research projects are concerned with the various ways in which vascular healing occurs and factors (such as smoking) that inhibit it. Dr. Wilgis stresses that one of the most important areas of research is clinical outcome studies, such as a current one on the cost and effect of extremity trauma on patients' lives.

Although the components of the Hand Center—surgery, rehabilitation, training/teaching, and research—are continually evolving, one thing remains constant—the focus is always the patient and ensuring that the patient can have a productive lifestyle.

◆ Beverly Sopp

EMS: The Stars of Life



FACT SHEET

Emergency Medical Services Week in Maryland
May 15 - 21, 1994

What Is EMS Week?

Emergency Medical Services (EMS) Week was designated by Congress to be May 15-21 this year and proclaimed by President Clinton to promote awareness and understanding of our emergency medical care system—its components and the services provided by millions of EMS personnel. The first EMS Week was proclaimed 20 years ago in 1974 by President Ford.

On a national level, EMS Week is coordinated by the American College of Emergency Physicians and a coalition of national EMS organizations and agencies. They determine the theme and logo of EMS Week and when it will be celebrated. Most states and local jurisdictions use the national theme and logo (see illustration above) in their own EMS celebrations. Many states and local jurisdictions (for example, Maryland and many of its counties) issue their own EMS Week proclamations.

Goals of EMS Week in Maryland

- Educate the public about recognizing medical emergencies and calling 9-1-1 for help anywhere in the state.
- Encourage the public to learn CPR and basic first-aid.
- Promote safety awareness to prevent accidents and injuries.
- Show appreciation to every member of the EMS team in Maryland.

Emergency Medical Services: The Stars of Life (Theme)

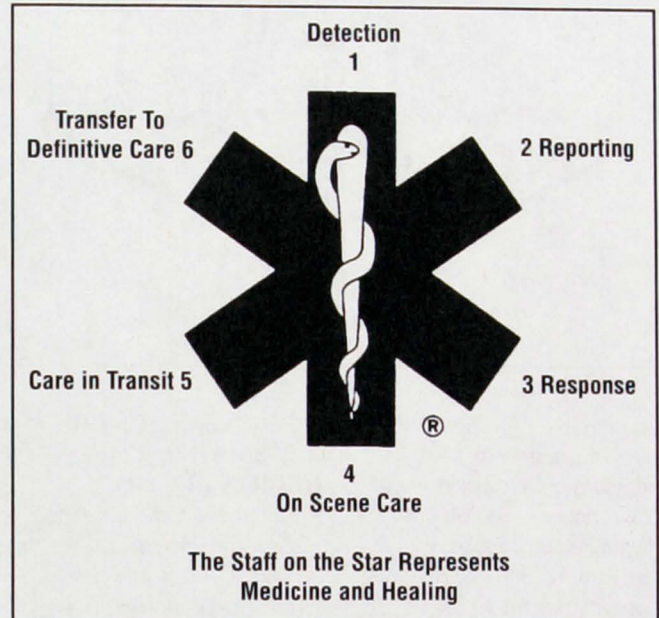
This year's theme focuses on EMS providers who, through their life-saving care, give the "star of life," which is the universally recognized EMS logo or symbol, its true meaning.

The Public's Role in EMS

Every citizen shares in the responsibility for his/her EMS system and should be prepared to actively participate in it when needed. For example, the public is often the first to arrive at the scene of a medical emergency. He/she becomes the "first-responder," in a literal sense. By recognizing what constitutes a medical emergency and knowing how to "activate" the EMS system by calling 9-1-1, a citizen fulfills the public's roles of "detection" and "reporting," as represented by two of the six points of the Star of Life (see illustration).

EMS Week Activities

The Maryland Institute for Emergency Medical Services Systems (MIEMSS), the state agency that coordinates Maryland's EMS system, is also coordinating statewide efforts to organize EMS Week events. On local levels, many prehospital and hospital providers will focus on activities to educate the community about the EMS system—what it is, when and how to use it appropriately,

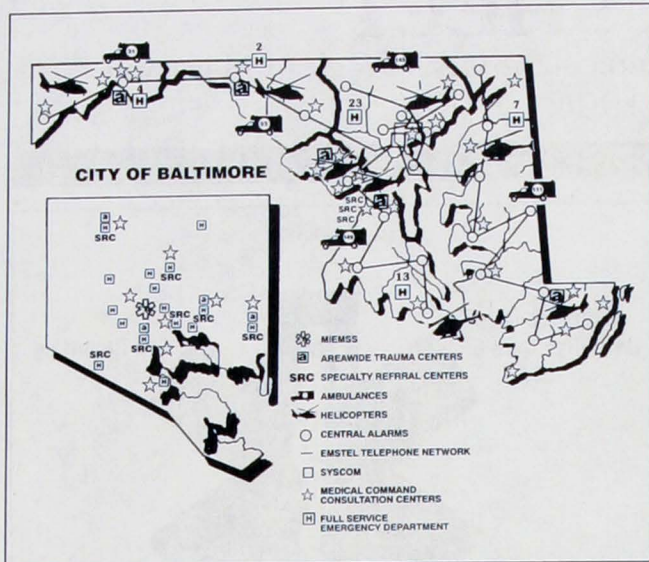


The logo of Emergency Medical Services, the Star of Life is displayed on ambulances and EMS equipment. Each of the six "points" of the star represents an aspect of the EMS system.

EMS Statistics by Region

Region I	
Ambulance Calls	9,446
Med-Evac Calls	154
Hospitals*	4
Ambulance Vehicles	31
Region II	
Ambulance Calls	27,429
Med-Evac Calls	366
Hospitals*	2
Ambulance Vehicles	53
Region III	
Ambulance Calls	252,411
Med-Evac Calls	1,787
Hospitals*	23
Ambulance Vehicles	145
Region IV	
Ambulance Calls	40,147
Med-Evac Calls	786
Hospitals *	7
Ambulance Vehicles	111
Region V	
Ambulance Calls	159,802
Med-Evac Calls	1,815
Hospitals *	13
Ambulance Vehicles	149
State Totals	
Ambulance Calls	489,235
Med-Evac Calls	4,908
* with 24-hour emergency departments	

how to recognize a medical or traumatic emergency, and how to give first aid/CPR, as well as how to prevent injury



and illness.

In previous years, activities have ranged from open houses, equipment displays, automobile extrications, and skills demonstrations to blood pressure screenings, bike rodeos, CPR classes, and poster, essay, and coloring contests. In addition, many hospitals held appreciation dinners or picnics to honor prehospital providers in their areas.

A statewide awards reception will be held Thursday, May 19. At this time, MIEMSS will honor EMS personnel who made extraordinary efforts in delivering prehospital emergency care or in improving the state's EMS system. Non-EMS individuals will also be recognized for their roles in providing life-saving care.

For Information

Contact the EMS Regional Office in your area (see below) or MIEMSS (410-706-3248).

REGION I

- Allegany and Garrett counties
- Region I Office in Grantsville, 301-895-5934

REGION II

- Frederick and Washington counties
- Region II Office in

Hagerstown, 301-791-2366 or 416-7249

REGION III

- Baltimore City and Anne Arundel, Baltimore, Carroll, Harford, and Howard counties
- Region III Office at MIEMSS in Baltimore, 410-706-3996

REGION IV

- Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester counties
- Region IV Office in Easton 410-822-1799

REGION V

- Calvert, Charles, Montgomery, Prince George's, and St. Mary's counties
- Region V Office in College Park, 301-474-1485

Maryland EMS Statistics

Emergency Calls

- 24 9-1-1 Centers
- More than 489,000 emergency calls received at 9-1-1 centers

More than 31,000

Emergency Prehospital Providers (Maryland-Certified)

- 14,239 First-Responders (40 hours training)
- 14,846 Emergency Medical Technicians-

Ambulance (EMT-As) (110 hours training)

- 1,297 Cardiac Rescue Technicians (240 hours training)
- 884 Emergency Medical Technicians-Paramedic (EMT-Ps) (500 hours training)

Patient Transports

- 489 Emergency ambulance (career and volunteer) vehicles
- 295,000 Emergency ambulance (career and volunteer) transports
- 320 Commercial ambulance vehicles
- 300,000 Commercial ambulance transports
- 8 Maryland State Police Med-Evac helicopter sections
- 4,500 Maryland State Police Med-Evac helicopter transports
- 400 Transports of newborns by the MIEMSS state neonatal ambulance

Emergency Care Hospitals

- 49 Hospital-based emergency departments with 24-hour service
- More than 1,591,000

emergency department visits

- 9 Adult trauma centers
- 20 Specialty referral centers (for pediatric, hand, and eye trauma; burns; neurotrauma; obstetric and newborn emergencies; hyperbaric medicine)

Base Station

Consultation Centers

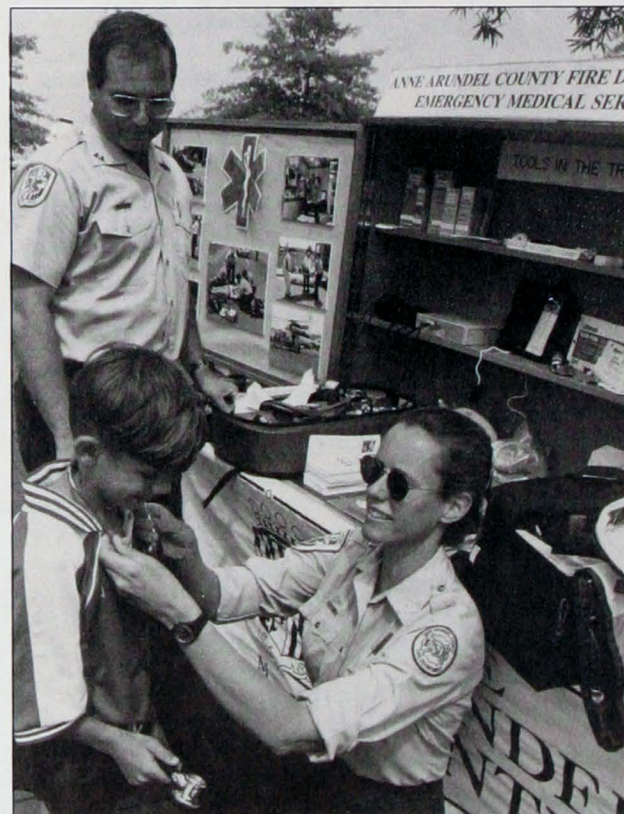
- 36 Hospitals providing on-line and off-line medical direction to prehospital care providers

Poison Consultation Centers Calls

- 70,000 calls received from Maryland by the Maryland Poison Center and the National Poison Center in D.C. (telephone consultation centers)

Emergency Care Hospital Personnel

- 500 (approximately) Emergency physicians
- 140 (approximately) Trauma surgeons
- 1,659 Emergency nurses
- 400 (approximately) Critical care nurses



A scene from EMS Day 1993 in Annapolis.

Number of Firearm Injuries, Deaths Still Climbing

Editor's Note: Author J. Alex Haller, Jr., MD, is a pediatric surgeon and emergency pediatrician at the Johns Hopkins Pediatric Shock Trauma Center. He is also associate medical director for children at MIEMSS.

In Maryland last year, more children died from firearms than from all motor vehicle related injuries combined.

The statewide statistics are revealing and alarming. In fiscal year (FY) 1992, 26 children (14 years and younger) died from gunshot wounds; in FY 1993, more than 40 in the same age group died from firearm injuries—a 54% increase over the preceding year. In FY 1992, 89% of those deaths were due to handguns; in FY 1993, 92% were from handguns. Children are rapidly becoming the victims of handgun proliferation.

The enormity of the firearms issue grows when one considers the number of children **injured** by firearms. For example, in Maryland in FY 1993, 154 children (14 years and younger) received gunshot injuries.

Although these statistics are for the entire state, they are unfortunately similar for individual hospitals, including my own institution's pediatric trauma center (Johns Hopkins). In 1992, 19 children who were victims of firearms were admitted; of these, 3 died and 12 are continuing slow rehabilitation from crippling injuries. In 1993, 33 children with gunshot wounds were admitted to our trauma center—an increase of **75%**.

Although I have been citing statistics for children injured by firearms, the number of gunshot injuries for adults is also frightening—1,386 victims over the age of 14 for FY 1993.

I and my EMS colleagues—from the prehospital team who are the first to respond to the scene of life-threatening injuries to the hospital physicians and nurses—know firsthand the devastating effects of accidental and intentional firearm injuries on children, teenagers, and adults. We are the front line, the "shock troops." Few could disagree that something must be done to prevent this gun violence.

Members of the National Rifle Association (NRA) are correct in that we need more stringent penalties for perpetrators of firearm assaults. We need less parole of those convicted of firearm-related crimes; if we were to

make an analogy to medicine, we could say that we need powerful effective medicine for the **treatment** of life endangering diseases. But the other medical arm of defense against disease is **prevention**—by vaccines and immunizations. We also need to prevent firearm injuries. All responsible gun owners in and out of the NRA should join us in supporting stronger legislation in both treatment (law enforcement) and prevention (reasonable handgun control) of firearm injuries.

Outlawing assault-type weapons, guns with large magazines holding multiple bullets, is absolutely necessary to decrease firearm violence. This will in no way limit hunters and sports gunners from lawful firearm use. It is my belief that teenagers under 21 should not be permitted to buy or own handguns. But any responsible adult (older than 21 years) without a criminal record or documented mental illness who obtains a State Police administered firearm license should be allowed to buy and own any firearm except automatic assault-type weapons. I also believe that this firearm license required to purchase guns should be required to obtain additional ammunition. (All these sensible recommendations were included in the comprehensive proposals of the Administration Firearms Bill of 1994 which was introduced into the State Legislation by Governor Schaefer's office. As this newsletter went to press, this bill had been approved by the Senate, approved 12-10 by the House Judiciary Committee, and was scheduled to be presented to the House of Delegates.)

With these reasonable gun control laws, we will not stop felons and criminals from illegal access to guns; but we will bring a new level of protection to our children and teenagers and prevent some of the violence in our streets, playgrounds, and schools.

References

1. Brent DA, Perper JA, Allman CJ, et al. The presence and accessibility of firearms in the homes of adolescent suicides. *JAMA* 1992;266:2989-2995.
2. Wintemute GJ, Teret SP, Kraus JF. When children shoot children: 88 unintended deaths in California. *JAMA* 1987;257:3107-3109.
3. Christoffel KK. Toward reducing pediatric injuries from firearms: Charting a legislative and regulatory course. *Pediatrics* 1991;88:294-305. (Based on recommendations

from a group of experts on firearm injury prevention assembled at the American Academy of Pediatrics Forum on Firearms and Children. Elk Grove Village, IL, Aug. 30-Sept. 1, 1989.)

4. Wilson MH, Baker SP, Teret SP, Shock S, Garbarino J. *Saving Children: A Guide to Injury Prevention*. New York: Oxford University Press, 1991.

5. Baker SP, O'Neal B, Ginsburg MJ, Li G. *The Injury Fact Book*. New York: Oxford University Press, 1992.

Gunshot Wounds in Maryland (Maryland Ambulance Information System Data FY 1993)*

- More than 10 EMS calls per day were received for response to gunshot wound incidents throughout Maryland.
- Approximately 75% of those calls (1,540 gunshot victims) resulted in patient transport to a hospital.
- Of those transported, 88% were taken by ground ambulance to the nearest appropriate facility and 12% by Maryland State Police Med-Evac helicopter.
- Roughly half (49%) required the services of one of the nine designated trauma centers in Maryland. The remaining gunshot wound victims went to either their local hospital emergency departments (48%) or directly to specialty referral centers (3%).
- The majority of gunshot wounds were to extremities.
- The greater Baltimore area represented the greatest demand (77%) for EMS response to gunshot victims.
- A large proportion of the gunshot victims transported (80%) were classified as either Patient Priority I transports (critical - needs immediate care to save life) or Patient Priority II transports (very serious - needs urgent care). These victims all required hospital care.
- Gunshot victims include all ages. In FY 1993, 39% (600 patients) of those transported were 21-30 years of age; however, 35% (539 patients) of those transported were under 20 years of age and 10% (154 patients) were under 14 years of age.
- Of those gunshot victims transported, 89% were male and 81% were of Afro-American descent.

*These data were derived from runsheet records completed by prehospital care providers (Montgomery and Prince George's counties did not submit data). Data from gunshot wound victims who were "walk-ins" to emergency departments are not included.

New Feedback Program for Prehospital Providers. . .

"Medic 10 to Communications. . . . Request one additional ambulance and a helicopter for two patients with chest and abdominal trauma. . . . Vital signs to follow. . . ."

How many times have you heard radio transmissions similar to this one? How many times have you sent a patient to a trauma center? Have you ever wondered, after the helicopter lifted off from the scene, "Did my assessment and findings include every injury?" or "Will this patient pull through?"

If you send your patient to Prince George's Hospital Center's Trauma Center, you will receive a response to those questions without even asking. **All** prehospital providers who transport or send patients to Prince George's Trauma Center receive a feedback letter generated by computer directly from information entered into the Maryland Trauma Registry (MTR) database. The trauma center averages 125-150 patients monthly; for each patient seen by the trauma team, a letter is generated, copied, and sent to each unit identified as being involved with on-scene activity: basic ambulance, medic unit, and, if appropriate, helicopter.

The project began in mid-1993 when Robert Dice, RN, MS, Trauma Coordinator at Prince George's Trauma Center, collaborated with the trauma registry software developers to design a letter that would combine prehospital care data gathered by George Linnell, EMT-A, EMS Liaison at the trauma center, with hospital data gathered by Mr. Dice via chart review and clinical data tracking from admission through discharge. (See box on page 7 for prehospital data compiled into the trauma registry. Among hospital data included are vital signs on arrival, initial and final injuries, resuscitation room and operative procedures, and emergency department and final disposition.)

A letter is computer-generated via the MTR's software which provides up-to-the-minute information about the patient's injuries and current status. Identifiers specific to the EMS incident are used to match each associated runsheet with clinical findings; but to guard patient confidentiality they never reference the patient's identity.

The letter has undergone several revisions to include, by request, several objective measurements of trauma severity, such as on-scene Revised Trauma Score (RTS), a nationally accepted means of physiological severity assessment that can be compared to the reported emergency department arrival RTS; final Injury Severity Score (ISS), a nationally accepted means of anatomical severity assessment that objectively measures the extent of injury in at least three body regions; and, as of the last revision, the time interval from the reported time of call dispatch to the patient's time of arrival at the trauma center. This was added to report the time spent in the field in relation to the "Golden Hour" concept espoused by R Adams Cowley, MD, the founder of MIEMSS and Maryland's trauma care system.

A comprehensive listing of the patient's final injuries is included, as well as the patient's initial disposition from the trauma resuscitation room and, if known at the time the letter is printed, the patient's final disposition from the trauma center. The patient's total length of stay in the hospital and, if appropriate, days spent in the ICU are also listed. The letter ends with

reference to Maryland state law (SB 584) stating that to continue patient confidentiality, the said letter must not be posted in a public place within the station.

Prior to implementing the computer-generated letter, Mr. Linnell provided handwritten feedback letters for several years to a **limited** number of prehospital care providers, mainly from the three Southern Maryland counties that Prince George's Trauma Center serves. As Mr. Linnell was amassing data for entry into the registry, he was also manually returning to the field providers that same information along with limited clinical findings and patient outcome information. However, this was a labor-intensive activity, which usually became backlogged for several weeks.

Now, with the aid of modern technology, all prehospital personnel within the counties and Maryland State Police helicopter sections that are served by the Prince George's Trauma Center receive comprehensive, computer-generated feedback letters about each trauma patient, usually within two weeks! Response to this informational feedback program has been overwhelming. Several stations

(Continued on page 9)

The Injury Severity Score (ISS) was developed by Baker, O'Neill, Haddon, and Long in 1974 (Baker SP, O'Neill B, Haddon W Jr., et al. The Injury Severity Score: A method for describing patients with multiple injuries and evaluating emergency care. *J Trauma*, 14: 187-196, 1974). ISS is a retrospective means to assess patient injuries based on anatomical findings. Each injury is first categorized by body region and then assigned an Anatomical Injury Scale (AIS) value. These components are used to derive an overall numerical score which is used to compare patient

severity independent of specific injuries.

The Revised Trauma Score (RTS) was developed and further refined by Champion, Sacco, and Copes in 1989 (Champion HR, Sacco WJ, Copes WS, et al. A revision of the trauma score. *J Trauma*, 29: 623-629, 1989). RTS provides a standardized quantitative means to assess the injured patient's severity based on commonly found physiological measures. This score has been used to assist in patient triage decisions and is a component in predicting patient outcome.

Revised Trauma Score Variable Breakpoints

Glasgow Coma Scale	Systolic Blood Pressure	Respiratory Rate	Coded Value
13-15	>89	10-29	4
9-12	76-89	>29	3
6-8	50-75	6-9	2
4-5	1-49	1-5	1
3	0	0	0

... Implemented at Prince George's Trauma Center

Prehospital Information For the Trauma Registry

Information sought by the trauma coordinators for input into the Maryland Trauma Registry includes the following items:

- Date of injury event
- Time of injury (approximate)
- Time of call dispatch
- First unit on the call, usually a BLS unit/ambulance (county and unit number), if applicable
 - Second EMS unit on the call, usually an ALS unit/medic unit (county and unit number), if applicable
 - Helicopter unit on the call (service and unit number), if applicable
 - Runsheet (Maryland Ambulance Information System or MAIS number for at least two EMS units on the call. (For those jurisdictions that do not participate in MAIS, the EMS incident number can be given in lieu of the MAIS number. If it is easier to track back on the incident number through a station log, even though the local program uses MAIS, please provide both the MAIS and the incident numbers to the coordinator; the feedback letter can report both entries.)

- Time of arrival of first EMS unit to the scene

- Initial on-scene vital signs to include complete blood pressure, pulse, respirations, and the components of the Glasgow Coma Scale score

- Time of patient departure from scene

- Field interventions may be included which are coded from a list provided by the coordinator

- Information regarding the injury, such as the use of protective devices, injury circumstances (for example, police intervention, self-inflicted, etc.; type of collision, such as tree, guardrail, other MV, etc.)

Remember, in the belief that prehospital, clinical, and rehabilitative phases of care are one continuum, your effort to create an accurate, legible, and complete record of care is essential.

Editor's Note: To give you an example of a letter generated by Prince George's Hospital Center's Trauma Center to a prehospital provider as part of its feedback program, we offer the following. However, to protect patient confidentiality, we have changed all numbers referring to dates, medic units, etc.



Prince George's Hospital Center's Regional Trauma Center
Field Feedback Program



March 21, 1994

"Somewhere" County Emergency Medical Services

Dear Chief:

For your quality assurance and educational purposes, we are providing you with the following information about this patient who was recently admitted to the Prince George's Hospital Center's Regional Shock Trauma Center.

Date of incident 1/1/94 dispatched at 20:01 as a 30 year old Male involved in a(n) Motor Vehicle Accident. [Other = undefinable E-code; Unknown = missing E-code]

Incident #12-3456 with ambulance 123456 and medic 123456 on scene. Transported priority 1 via helicopter (if helicopter: Trooper 99, #123456; MSP #123) and arrived on 1/1/94 at 21:05 with a STAT Team ALPHA in attendance. [99# = PG County Rescue Unit; 99# = DC Ambulance]

The time interval from CALL DISPATCH to PATIENT ARRIVAL to the Trauma Center was 64 minutes (1.07 hours).

Vital signs upon arrival to the Shock Trauma Center were: BP 151/065; Pulse 122; Resp 24; Coma scale 13 yielding an admission Revised Trauma Score (RTS) of 12. If vital signs were reported, his on-scene RTS was 9. RTS ranges from 0 (absent vital signs) to 12 (normal vital signs). Major injury is realized at an RTS of <=10.

The patient was admitted to the floor on 1/1/94 at 23:30. Current status is alive. He was transferred to a rehabilitation facility on 1/12/94 after 11 days of which were spent in the ICU. If the patient was transferred, he went to "Somewhere" Hospital for inpatient rehab.

Injuries noted for this patient at discharge were the following:

concussion, ?LOC, amnesia
lac scalp
mult abr torso
mult cont torso
cont R brachial plexus with paresis R arm

NOTE: Injuries are usually abbreviated (e.g., abr - abrasion; cont = contusion; lac = laceration; fx = fracture; hptx = hemo/pneumothorax; ICH = intracerebral hemorrhage; E/SDH = epi/subdural hematoma; NFS = not further specified). Pertinent and/or operative procedures during the patient's stay begin with @.

These injuries yielded an Injury Severity Score (ISS) of 5. ISS ranges from 0 (no injury) to 75 (unsurvivable injury) and represents a scoring of the patient's worst injuries in at least 3 body systems. Major injuries are realized at an ISS of >=15.

The STAT team and the Attending Trauma Surgeon at the Prince George's Hospital Center would like to thank you and your crew for referring this patient to its Regional Shock Trauma Center.

Pursuant to Maryland State Law (SB 584) regarding confidentiality of medical records, we also must ask that this information be provided only to the appropriate department officers and crew members. Please do not post this letter in a public place within your department's quarters!

If any of the above prehospital information is incorrect or if you have any further questions about this particular patient, please contact either George Linnell on (301) 618-2000 (evenings) or Robert Dice on (301) 618-2364 (daytime). Please reference either the arrival date and time (1/1/94; 21:05) or the patient's registry number (#12345).

Sincerely,
Brajendra Misra, MD, FACS, Chief of Trauma
Robert Dice, RN, MS, Trauma Coordinator
George Linnell, PFC, EMS Liaison

Maryland EMS Community Participates. . .

Maryland EMS is on the frontier of a new era ushered in by last year's legislative changes in EMS governance codified in COMAR Article 13, Section 103 of the Education Article.

In part, the new law mandates that the new EMS Board shall develop and adopt an emergency medical system plan to ensure effective coordination and evaluation of emergency medical services in Maryland. This plan will include the following:

1. Criteria for the designation of trauma and specialty referral facilities, including all echelons of care;
2. Criteria and guidelines for the delivery of emergency medical services, including provisions to ensure proper medical direction of emergency medical services;
3. A plan designed to maintain and enhance the communications and transportation systems for emergency medical services;
4. Provisions for the evaluation of emergency medical services personnel training programs;
5. Provisions for the establishment of public information and education programs designed to enhance the public's understanding of the emergency medical system;
6. Criteria and methodologies to evaluate the system's effectiveness in

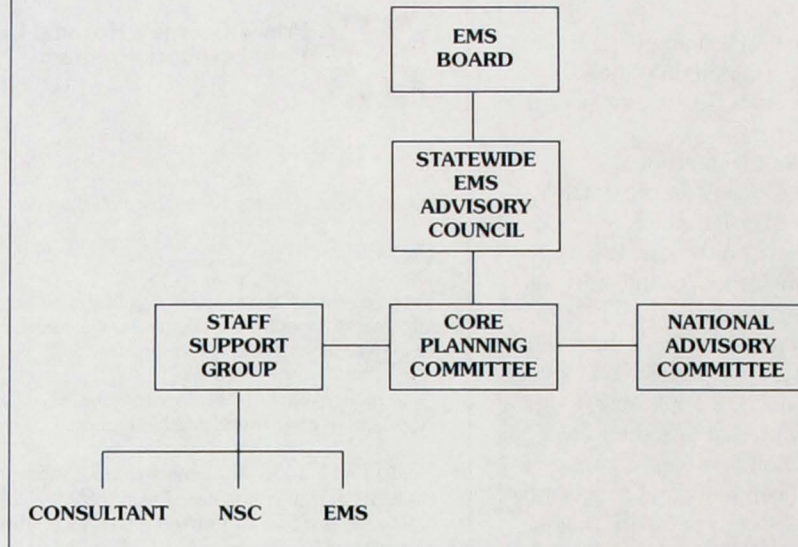
Incident Command Seminar Offered In Hagerstown

A seminar on incident command featuring Chief Alan Brunacini, of the Phoenix Fire Department as instructor, will be held April 30 and May 1 at the Kepler Theater on the campus of Hagerstown Junior College.

The seminar will focus on the incident commander, standard operating procedures, functions of command, and safety.

The seminar is offered to all fire and rescue personnel (free to those in Washington County and for a \$50 registration fee to those in other counties). For information, contact Jim Kerabner at the Funkstown Fire Station (301-790-0090).

PLAN REVIEW/DEVELOPMENT STRUCTURE



delivering quality emergency medical services needed by the citizens of Maryland; and

7. Provisions for the evaluation and monitoring of the emergency medical system plan to ensure compliance with the subtitle.

The new law, the new EMS Board, and the new Statewide EMS Advisory Council (SEMSAC) provide the ideal opportunity for the Maryland EMS community to redefine the vision that has been the driving force behind EMS in this state. Toward this, the development of a new state EMS plan through consensus building has begun.

Within the 27-member Statewide EMS Advisory Council, a Core Planning Committee (see box on page 9), assisted by a staff support group (and a soon to be appointed national advisory committee), has developed both an outline for the key elements in the planning process (see box) and a time line for the first phase of the planning process (February - December 1994). During this first phase, opportunities to participate in the planning process by members of Maryland's EMS community will be made available during April and May in each of Maryland's five EMS regions through the Regional EMS Councils and Regional EMS Offices. Regional EMS Planning and Issues Conferences have begun or are scheduled throughout the state to solicit long-term planning issues which should

be addressed in a statewide plan. Furthermore, each EMS regional office can be contacted (preferably in writing) on which important issues you feel should be considered in the plan.

In mid-July 1994, a state planning
(Continued on page 9)

KEY ELEMENTS IN PLANNING PROCESS

1. Description: Our Current Organization and Our History
2. Visioning: Our Values and Our Images of Ourselves in the Future
3. Mission: The Definition of Our Business and Our Purpose
4. Stakeholders: Key Individuals, Groups, Organizations
5. Forecasting: Assumptions about a Changing Environment
6. External Environment: Threats and Opportunities
7. Internal Environment: Strengths and Weaknesses
8. Overall Strategy: Optimal Choices for the Future
9. Gap Analysis: Relation of Our Strategy to Our Capacity

... In EMS Plan Development

(Continued from page 8)

conference will be conducted with the SEMSAC Core Planning Committee, SEMSAC members, two representatives from each EMS region, nationally known evaluators, and the staff support group. This group will review and evaluate the issues identified through the regional meetings and formulate objectives for the EMS Plan. During August, September, and October 1994, the SEMSAC Core Planning Committee will develop a preliminary report and present it to the entire SEMSAC membership for review and approval. During November and December 1994, the SEMSAC will present the report on the plan's progress to the EMS Board for its review and approval. In January 1995, the EMS Board will provide a report to the state legislature on the progress of the development on the new state EMS Plan.

The planning process will take at least two years before a final draft EMS Plan is produced; however, now is the time to get involved. The following dates for the Regional Planning Issues Conferences have been scheduled:

EMS Region I

April 21, at 7:30 pm
Allegany Community College, Cumberland
Contact: David Ramsey, 301-895-5934

EMS Region II

May 4, at 9 am
Ramada Inn, Conference Facility, Hagerstown
Contact: Richard Mettetal, 301-791-2366

EMS Region III

Held March 23
Western Maryland College, Westminster
Contact: John Donohue, 410-706-3993

EMS Region IV

May 21 at 10:00 am
Memorial Hospital, Easton
Contact: Marc Bramble, 410-822-1799

EMS Region V

April 28, at 10:15 am
Cranford-Grave Fire Service Building,
Landover Hills
Contact: Marie Warner-Crosson,
301-474-1485

Please do not hesitate to contact your regional EMS office for further information on these conferences or any issues that you feel should be addressed in the plan's development.

◆ *Ronald Kropp, MHS*
Director, Planning, Development,
and Management Analysis,
MIEMSS

PG Trauma Center Feedback Program

(Continued from page 6)

actually conduct "mini-case presentations" at company meetings. Most hold a copy of the runsheet in a notebook awaiting the arrival of the feedback letter so that initial findings and impressions can be compared to those of the trauma team. Many providers appreciate the knowledge of patient outcome—that what they did on the scene contributed to the survival of the patient with ultimate discharge to home or to a rehabilitation center.

As part of any good trauma system quality management (QM), some form of feedback to the prehospital arena is desired. Mr. Dice encourages prehospital providers who do not receive educational and quality improvement information from their trauma center to contact its trauma coordinator to inquire about this process. While no Maryland trauma center is required to implement this particular feedback program, it is feasible for those who participate in the MTR. The Department of Quality Resources at Prince George's Hospital Center has determined that the current letter format (see page 7) complies with the patient confidentiality provisions of SB 584. Mr. Dice stresses that sharing this information in a timely manner may assist a prehospital provider to focus his/her patient assessment skills or assist him/her to better define the patient who meets trauma center criteria.

For further information on this program or help in modifying it to meet a trauma center's own feedback needs, contact Robert Dice, RN, MS, Trauma Coordinator, Prince George's Hospital Center, at 301-618-2364.

IMPORTANT

If a patient is transported (via ground unit) to a trauma center, PLEASE BE SURE THE COMPLETED RUNSHEET IS PLACED WITH THE PATIENT'S EMERGENCY DEPARTMENT RECORD. This is a matter of compliance with State Law requiring notification of prehospital personnel regarding potential or actual infectious disease exposures. WITHOUT THE RUNSHEET, NO NOTIFICATION OF PERSONNEL CAN BE INITIATED!

STATE EMS ADVISORY COUNCIL CORE PLANNING COMMITTEE (MEMBERSHIP)

John W. Ashworth, Chairman
R Adams Cowley Shock Trauma
Center

Robert A. Barish, MD
American College of Emergency
Physicians, Maryland Chapter

Willie Blair, MD, FACS, Co-
Chairman
Member, Emergency Medical
Services Board

Mary Coburn
Maryland State Council of the
Emergency Nurses Association

Vicky J. Coombs
American Association of Critical
Care Nurses
Maryland Chapter (Chesapeake
Bay)

Brad M. Cushing, MD
National Study Center for
Trauma/Emergency Medical
Systems

Dorothy Dyott
Maryland EMS Region IV
Advisory Council

Leon Hayes
Maryland EMS Region V Advisory
Council

Ronald Lipps
State Highway Administration

Lynn Workmeister
Maryland General Public
(County less than 175,000
population)

Early Recognition of 'Lap Belt Complex' Injuries Crucial

Current legislation, public education, and law enforcement efforts have increased the use of both car seats and safety belts across the country. Each year fewer children are killed from being ejected through car windows as "human bullets" as a result of being unrestrained during motor vehicle crashes. National recommendations for infant and toddler car seat weight limits are well publicized. But for the child who weighs more than 40 pounds or is taller than the back of the toddler seat, information and recommendations for booster seats have not been widely available until recently.

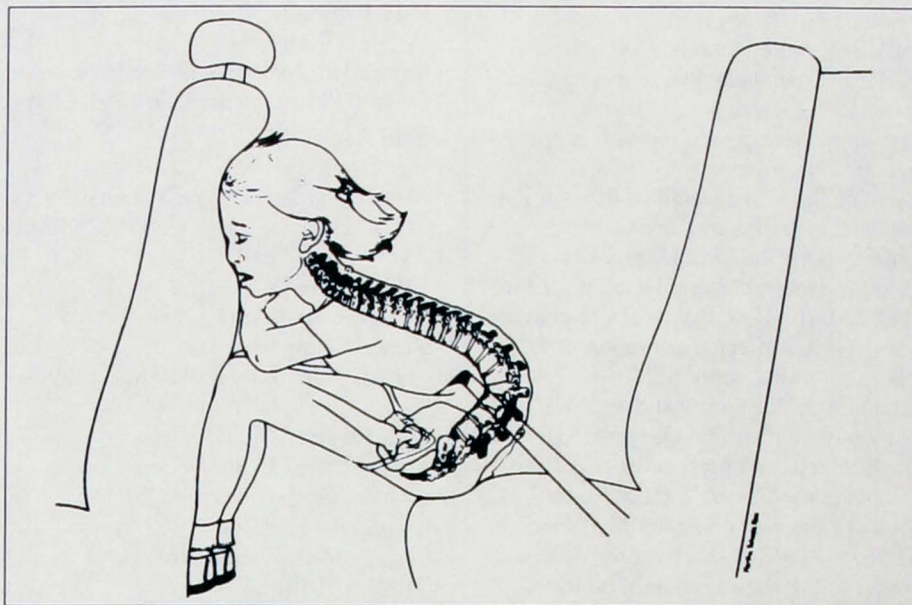
Parents frequently place the preschool-age or young school-age child in either a 2-point restraint system (lap belt) or a 3-point restraint system (lap belt and shoulder harness) but may use it incorrectly. (Please see specific recommendations for child restraint systems in the February 1994 issue of the *Maryland EMS News*.)

However, research has shown that a certain age group of children, even if correctly buckled, may be at risk for a specific complex of injuries. This group consists of older preschool-age or young school-age children who are correctly restrained in a 2-belt system (lap belts) or incorrectly restrained in a 3-belt system so that it functions as a 2-belt system (that is, the shoulder harness is placed behind the child) so that only the lap belt restrains the child). These children are at risk to sustain the "seatbelt syndrome" or the "lap belt complex" of injuries. **However, despite this risk, use of a 2-point or 3-point restraint system is essential to prevent irreparable brain damage.**

The "lap belt complex" of injuries includes:

- bruising across pelvis and abdomen
- hematuria (blood in urine)
- lumbar spinal column fracture and/or subluxation
- lumbar spinal cord injury (typically incomplete)
- abdominal injury to hollow organs (bowel perforation)
- abdominal injury to solid organs (spleen/liver)
- perforation of the intestinal viscera
- bladder hematoma or rupture
- mild to moderate head injuries

This specific "lap belt complex" of injuries is not found in older children or adults because the adult frame allows for the focal point to be at the pelvic girdle spreading the impact of the car crash



across the strongest bone. In contrast, due to a child's weight distribution, the child in a lap belt sustains the force of the energy of the impact of the car crash at the middle of the abdomen and against the spinal column. During deceleration, the lap belt acts as a fulcrum upon which the child's body clams shut (see illustration) and then snaps back to an upright position. Specific anatomical differences in children that increase the risk of injury include: small or incompletely developed pelvis, shorter torso, small anteroposterior diameter, and higher center of gravity.

Early recognition of the "lap belt complex" of injuries is important because many of the abdominal injuries are initially life-threatening. In addition, spinal column and cord injuries are often associated with lap belt injuries. Improper handling of a child with lap belt injuries could result in further injury.

As with all trauma victims, assessment of the child at risk for a lap belt injury begins with the **Primary Survey**:

- Airway
- Breathing
- Circulation
- Disability
- Exposure and Extremities

The **Secondary Survey** should include serial evaluations of neurologic and cardiovascular status, as well as gastrointestinal and genitourinary status, which are critical to the identification of delayed signs of injury.

Proper immobilization of the child with a suspected spinal column and/or cord injury was discussed in the February issue of this newsletter. The child who has been

restrained in a lap belt (2-point restraint system) is at risk for BOTH cervical spine and thoracic-lumbar spine injuries and must be protected from further movement and the resulting secondary injuries.

Written documentation from the prehospital care provider about the mechanism of the motor vehicle crash and the child's exact position in the vehicle will assist hospital personnel in their evaluation of the child. At the hospital, the child will be evaluated for thoracic and lumbar injuries, abdominal injuries, and neurological deficits. X-ray procedures will usually include lateral view of the T-L spine, abdominal CT scan, and flat abdominal film. Occasionally, if there is a suspicion of bowel injury, a peritoneal lavage will be performed in the emergency room, operating room, or intensive care unit.

Despite the possibility of lap belt injuries, the use of lap belts is far preferable to leaving a child unrestrained in a car. Children who weigh between 40 and 70 pounds should be restrained in booster seats, which offer an alternative to lap-belt-only restraint. Better technology is still needed to protect the older preschool-age and younger school-age child riding in a car. As more knowledge is gained about passenger restraint systems and the mechanics of motor vehicle crashes involving children, targeted public education and public policy may further decrease mortality and morbidity of crashes.

◆ *Cynthia J Wright-Johnson, MSN, RNC, CRRN
Pediatric Nurse Coordinator,
MIEMSS*

Nasotracheal Intubation Beginning to Be Used in Maryland

Do not be surprised if you see a new approach to some difficult airways being used by certain EMT-Paramedics across Maryland. As of February 1, 1994, the Maryland State Police Aviation Flight Paramedics have begun using the technique of nasotracheal intubation, and it is anticipated that other ALS Programs will be choosing to have their EMT-Paramedics employ this Statewide Paramedic Optional Skill (Category B) as well. The procedure, which involves anesthetizing the nostril of a breathing patient and then passing an endotracheal tube through it, was approved by the Regional Medical Directors in November and by the State Board of Physician Quality Assurance in January.

Nasotracheal intubation is intended for use in patients in whom intubation is needed but an oral approach cannot be used. One example of this would be a patient with a severe head injury (Glasgow Coma Scale score or GCS score ≤ 8) who requires hyperventilation but in whom a laryngoscope cannot be placed due to a tightly clenched jaw. Another example would be a patient with severe pulmonary edema who is gasping for breath and not oxygenating well, but is too awake to allow placement of a laryngoscope. The new protocol states that the procedure can be considered in patients who are breathing and in whom oral intubation is difficult, as long as one of the following is present:

- Oxygen saturation of $\leq 85\%$ in a patient on 100% oxygen by face mask and respiratory distress
- Respiratory rate of ≤ 8 per minute or ≥ 44 per minute
- Glasgow Coma Scale score of ≤ 8
- Loss of gag reflex

The technique of nasotracheal intubation has some disadvantages, and therefore should be used only when an oral approach cannot be carried out. It requires that the patient be breathing, as this is what guides the paramedic in advancing the tube. Nasotracheal intubation cannot be used in patients with significant mid-facial injury or with signs of basilar skull fracture, as there is at least a potential danger of the tube causing intracranial injury if there is a crack in the base of the skull (cribriform plate). This procedure cannot be used

for patients taking anticoagulants or with other tendencies to severe nosebleeds, since significant bleeding can result. The nasotracheal approach is contraindicated in children less than 14 years old because of the risk of bleeding from the abundant adenoidal tissue found in this age group.

While nasotracheal intubation does have some disadvantages, it is a relatively safe procedure if used appropriately. Given that there are

patients who are truly in need of endotracheal intubation but in whom the oral approach cannot be carried out, nasotracheal intubation has the potential of becoming an important tool for the paramedic in bringing improved oxygenation and hyperventilation in a timely fashion.

◆ *Douglas J. Floccare, MD, MPH, FACEP*
State Aeromedical Director

Emergency/Trauma Center at Peninsula Regional

A ribbon cutting on March 20 marked the grand opening of the renovated and enlarged Emergency/Trauma Center of Peninsula Regional Medical Center in Salisbury.

The renovation of the 10,000 square foot facility, plus the new 6,000 square foot addition, will enable patients to be directed into one of three kinds of care: minor care, immediate care, or critical/trauma care. A total of 32 beds, a larger room for cardiac arrests and trauma resuscitation, a decontamination room, and an intensive medical room are all features of Peninsula Regional's state-of-the-art center. Other patient conveniences include a covered entrance, more

privacy, and more security.

"The ribbon cutting," according to Robert Adkins, MD, Region IV medical director and medical director of emergency services at Peninsula Regional, "was the culmination of 3-4 years of planning and 18 months of renovating and expanding the emergency department. It was the result of the combined efforts of a lot of people—the board of trustees, the hospital staff, the physicians, and the community. All of them were dedicated to the renovation and expansion project so that Peninsula Regional could better serve the community as a trauma center and as a community hospital."

"As the designated trauma center for the Eastern Shore, Peninsula Regional is one of the cornerstones of Maryland's Emergency Medical Services System," said Dan H. Akin, president. "Peninsula Regional has achieved the reputation for a level of care comparable to that found in some large metropolitan institutions. The staff in our Emergency/Trauma Center has been providing high quality treatment 24 hours a day for many years. With this expansion, Peninsula Regional will be able to accommodate an even larger number of patients, regardless of their medical needs."

"Peninsula Regional provides trauma services at a level much greater than at most rural facilities," said Donald W. Mabe, chairman of the board of trustees. "We have made a commitment to provide the facilities, equipment, medical staff, and hospital staff to ensure the availability of this important service to residents and visitors to the Eastern Shore."



Participants in the ribbon-cutting ceremony at Peninsula Regional Medical Center included (l-r) Jackie Lockwood (nursing director); Dave Foley, MD (chief of emergency services); Robert Adkins, MD (medical director of emergency services); Dan Akin (president/CEO); Thomas DeMarco, MD (chief of staff); Karen Poisker (vice-president, patient care services); and Ann Coates (vice-chairman, Board of Trustees).



Governor William Donald Schaefer

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**Maryland Institute
for
Emergency Medical Services Systems**

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636 W. Lombard St., Baltimore, MD 21201-1528

DATED MATERIAL

Dr. Richard Alcorta Resigns as State EMS Director



Richard L. Alcorta, MD, FACEP, appointed Acting State EMS Director in August 1992, resigned effective April 29. He will return to the practice of clinical emergency medicine.

I would like to say a heartfelt thank you to everyone for the last 20 months and for the good luck wishes from so many. My decision to resign was a difficult one and everyone's support has been greatly appreciated. I truly enjoyed my tenure at MIEMSS and I want to share with you, in David Letterman style, my TOP TEN lists of what I will and will not miss.

*Thank you all,
Richard Alcorta, MD, FACEP*

Top Ten I WILL NOT miss . . .

10. Making a presentation and realizing I have the 3x5 note cards.
9. Getting up early and wearing a tie every day.
8. Trying to convince my wife that MSFA does meet on Sundays.
7. Losing money in the Dunning Hall soda machine.
6. Hearing my wife complain about the "ugly" state car in the driveway.
5. Downtown Baltimore winds blowing and messing up my hair.
4. Coming home and having to convince my dog that I live here.
3. Having my beeper go off at all hours.
2. My desk that looks like Santa Claus' mail room on Christmas Eve.
1. Saying "acting."

Top Ten I WILL miss . . .

10. My state car a.k.a. the "Bluesmobile."
9. Having peas for lunch with Ron Schaefer in his office.
8. Having important people on hold.
7. My "beam me up, Scottie" portable phone.
6. Visiting all the regions of Maryland.

5. Being part of a rapidly advancing EMS system.
4. The frequent opportunities to teach.
3. The excellent staff at MIEMSS.
2. The constant challenge of the job.
1. Everyone I have had the pleasure to meet and work with while in this position.

"The Nasal Trumpet"

Airway management is an essential skill for any prehospital care provider. Adequate airway control with appropriate adjuncts is paramount in the resuscitation of the unconscious patient. Inserting a nasopharyngeal airway ("the nasal trumpet") is taught in the oxygen module for First Responders and in the Airway Adjunct Enhancement Workshop. If a First Responder has completed either of these, both MIEMSS and MFRI agree that he/she should be allowed to use the nasopharyngeal airway as a routine airway management adjunct.