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EMS News

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For All Emergency Medical Care Providers

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Tuberculosis: Infectious Threat Reemerges

Tuberculosis has reemerged as a health threat in the United States. In the early 1980s, this disease was thought to be on the way to extinction. But now, the incidence of TB is rising and drug-resistant strains have emerged. Those new strains require longer treatment, and their cure rate is below 60%, compared with 100% for drug-susceptible strains.

To inform EMS personnel about the risks of tuberculosis in the prehospital environment and about precautions that will minimize the possibility of transmission, MIEMSS has prepared a training module specifically on this disease. That module consists of a 30-minute videotape (produced by MIEMSS) as well as a 30-minute training session on respiratory protection (to be developed by local jurisdictions). Based on the infection control program developed by Kenneth Pardoe, PA-C, NREMT-P, the Infection Control Officer in the Anne Arundel County Fire Department, the presentation is one component of MIEMSS' new, comprehensive Infection Control Program. The coordinator of that updating project is Beth Nachbar, Region III Assistant Administrator. The tuberculosis component complies with the enforcement policy for mitigating the hazard of workplace exposures to tuberculosis, as issued by the Occupational Safety and Health Administration and adopted by MOSH.

The information in this article was extracted from MIEMSS' tuberculosis training module. The program will be part of the certification and recertification curricula; distribution is currently underway through the regional offices.

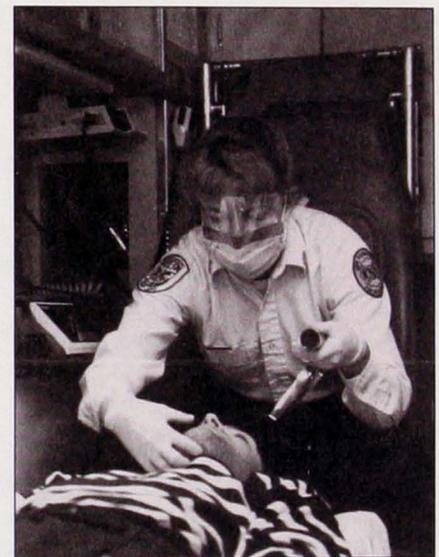
Transmission

Tuberculosis is an airborne

bacterial disease. It can be transmitted when a person with active TB talks, coughs, or sneezes and thus expels the infective organism on airborne droplets. If the tuberculosis organism then enters another person's respiratory tract, the infection may be passed. The risk depends on the level of contamination of the air breathed in, the length of exposure to that air, and the person's physiologic ability to prevent or fight the infection.

Several factors in the prehospital environment heighten the risk of TB transmission. Procedures that spray or aerosolize secretions may force infectious droplets into the air. Examples include endotracheal intubation, suctioning, the use of bag-valve masks and positive-pressure demand valves, and administering aerosolized medications such as albuterol. Additionally, because ambulances, paramedic units, helicopters, and police vehicles are confined spaces, any airborne agents pose greater risks to the occupants if the area is not ventilated properly.

TB infections can be latent or active. Most people with latent disease have a positive reaction to the skin test used to test for TB, but they do not have the clinical symptoms of the disease and **cannot** pass the infection to others. The bacteria that cause TB **can** be transmitted by someone with active disease. In people with active TB, any of the following signs and symptoms may be evident: persistent cough lasting more than 2 or 3 weeks, fever, chills, night sweats, easy fatigability, loss of appetite, weight loss, and bloody sputum. The diagnosis of TB must be confirmed by a physician. Diagnostic measures for identifying tuberculosis include a history, physical



If there is a risk of exposure to TB, face and eye protection for the prehospital provider are warranted.

examination, tuberculin skin test, chest film, and sputum smear and culture.

The tests that confirm TB may require 3 to 6 weeks to reach conclusive results. Therefore, prehospital personnel cannot be sure that a patient with suggestive symptoms is actually harboring the disease. Suspicion should be heightened if a patient confirms that he or she has tested positive for TB or is taking a medication used to treat it. (The most common are isoniazid [INH] and rifampin.) The length of treatment is also an important factor: medications usually must be taken for 6 months.

Protection

Respiratory protection equipment must be available to prehospital personnel and used when transporting a patient with known or suspected tuberculosis. The current minimal

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acceptable level of respiratory protection is a high-efficiency particulate air (HEPA) respirator approved by the National Institute of Occupational Safety and Health. MOSH requires employers to train personnel in the proper selection, fit, and use of this equipment as well as its limitations. Also at the local level, the Infection Control Coordinator, or the person with that responsibility, is to develop a Respiratory Protection Program and evaluate it at least annually.

As emphasized in any infection control plan or program, universal precautions against infectious agents **must** be taken when exposure to blood and body fluids is possible. The respiratory protection against tuberculosis extends beyond those customary measures. In all situations, special attention to face and eye protection is warranted when prehospital care involves the procedures listed above in the discussion of risks of exposure.

Vehicle ventilation is another method of controlling the risk of airborne infections such as tuberculosis. A transport vehicle's treatment area can be ventilated by opening the windows, using exhaust fans, and simply allowing the space to "air out." In hot and cold weather, discretion about ventilation is obviously necessary. When possible, the partition between the cab and patient care area should be closed.

Screening

All prehospital care providers (in fact, all health care workers) should be screened for TB at least annually. If frequent exposure to patients with TB can be expected, as determined by jurisdictional risk assessments, screenings may be done more often.

The screening test has two parts: intradermal injection of PPD (purified protein derivative) and interpretation of the skin reaction by designated, trained personnel between 48 and 72 hours after injection. Although many prehospital care providers may remember a time when they could interpret their own PPD results and report them, such self interpretation is no longer acceptable.

Anyone who converts from a negative to a positive PPD test should

be evaluated promptly for clinically active TB. The evaluation includes a chest film and clinical assessment. Preventive drug therapy should be considered for a person with a positive test but without clinical evidence of the disease. If active TB is identified, appropriate and aggressive treatment is usually indicated.

Local Responsibilities

Although disease transmission and protective measures are well understood, they continue to be studied. Therefore, recommendations issued by any agency will be updated

periodically, with the goal of offering the most accurate information possible. Infection Control Officers are resources for interpreting policies and guidelines related to control of bloodborne and airborne pathogens in the prehospital environment. They can advise you about the protective equipment that has been approved for use, equipment cleaning procedures, screening programs, and follow-up reporting requirements.

◆ Linda Kesselring



CPR Across Maryland: April 16, 1994

On Saturday, April 16, all 23 Maryland counties and Baltimore City will host free citizen CPR training programs. The "CPR Across Maryland" program, the first of its kind in Maryland, has the potential to train thousands of citizens statewide on a single day. In addition, it will raise public awareness about the crucial need for the public to be trained in CPR and their crucial role in the "chain of survival."

CPR training sessions will last approximately three hours and will be free to the public. The sessions will include information on heart disease, risk factors, accessing the EMS system, signs and signals of a heart attack, mouth-to-mouth breathing, one person adult CPR, and care for a conscious or unconscious choking victim. Classes will follow the guidelines of the American Heart Association. For information on locations of these sessions, call 1-800-488-4CPR.

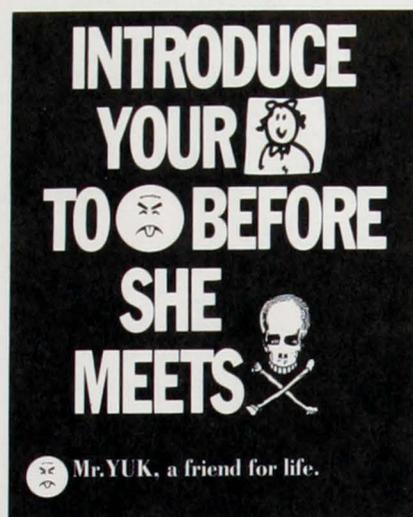
"CPR Across Maryland" is modeled on the successful CPR Awareness Day held for the last six years by Prince George's County Fire Department through the efforts of the department's CPR coordinator FF Steve Ager. More than 6,700 citizens have received CPR training as a result of those six awareness days. Last year, during the sixth annual CPR Awareness

Day, 2,002 citizens received CPR training in Prince George's County. More than 300 instructors and staff donated their time to make that event possible. In addition, more than 50 organizations made donations to Prince George's County's CPR Awareness Day, which brought together the resources of many organizations, including the Fire Department, Prince George's County Public Schools, and Doctors Community Hospital.

The Baltimore County Fire Department and Montgomery County Department of Fire and Rescue Services have held similar events, and several other jurisdictions have inquired about putting together a program of this type. As a result of such interest, Prince George's County is coordinating this year's statewide CPR awareness day, with organizations in each of the state's 24 jurisdictions coordinating local events.

CPR Across Maryland is cosponsored by the American Heart Association Maryland Affiliate, MIEMSS, HealthPlus, and Prince George's County. Instructors are needed in all counties throughout the state. Individuals interested in assisting or requesting additional information should contact Steve Ager at 301-772-9076.

Poison Prevention Tips



Poster from Maryland Poison Center.

March 20-26 is National Poison Prevention Week. Since September 1961, when Public Law 87-319 was passed by Congress and signed by President Kennedy, the third week in March is dedicated to raising the awareness of communities about the risk for unintentional poisonings. The age group at greatest risk for unintentional poisonings are children between the ages of one and five years. The theme for this year's National Poison Prevention Campaign is "Children Act Fast . . . So Do Poisons."

Children learn by exploring and experimenting with the environment that surrounds them. In a sense, their job is to play. But the job of parents, grandparents, child care providers, and teachers is injury prevention, including poison prevention. In fact, all adults have a responsibility to create a safe environment for children to play and learn. For more than 30 years, we have seen poison prevention posters, flyers, Mr. Yuk stickers, and lists of poisonous substances. But the problem of poisonings still exists. In 1992, over 1.8 million poisonings were reported in children and adults nationally. The Maryland Poison Center reports more than 60,000 calls a year. The National Capital Poison Center in D.C. reported more than 10,000 calls from Maryland last year. Poison prevention is a daily task in our homes, schools, work places, and community.

Target areas for poison proofing homes include:

- Keep all products and medications in their original containers with labels.
- Keep all medications and potentially harmful products out of reach

and locked in cabinets. Always use child restraint containers (safety lock caps).

- Keep Syrup of Ipecac in your home and the Maryland Poison Center phone number next to the bottle and next to all phones. Always call the Poison Center before using Syrup of Ipecac.

- Kneel down and walk or crawl through your home looking for potential poisons. (Walking or crawling on your knees will give you a child's perspective.) Also look for small objects that infants and toddlers could choke on.

- Keep a list of potential and known poisonous products and plants and survey each room of the house for them. Many popular house and garden plants are considered poisonous and can produce symptoms ranging from minor to severe. The Maryland Poison Center has compiled a list of common poisonous and nonpoisonous plants that is available by calling 410-706-8122.

- Know which products to place Mr. Yuk stickers on and teach preschoolers and older children that Mr. Yuk means "No - do not touch."

Equally as important as primary prevention, the second line of defense in an unintentional poisoning is appropriate emergency action. The Maryland Poison Center, in conjunction with the American Association of Poison Control Centers, has developed a pamphlet for the public on emergency action for poisons; this pamphlet provides immediate responses for poisonings, whether they were swallowed, inhaled, absorbed through the skin, or splashed in the eye. This pamphlet and other informational brochures as well as Mr. Yuk stickers and stickers with the 9-1-1 number and the Maryland Poison Center number can be obtained by writing to and sending a self-addressed, stamped envelope to Poison, 20 N. Pine Street, Baltimore, Maryland 21201. Additional information is available by writing Secretary, Poison Prevention Council, P.O. Box 1543, Washington, D.C. 20013, or calling the Maryland Poison Center 410-706-8122 and/or U.S. Consumer Products Safety Commission 800-638-CPSC.

**For poison emergencies call the
Maryland Poison Center:
410-528-7701
800-494-2414**

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

D.C. Poison Center Plans To Close

The National Capital Poison Center, which handled calls from D.C. and the surrounding areas of Virginia and Maryland, is planning to close on February 28 (as of the time this newsletter went to press); Maryland residents who formerly used the D.C. poison center because of their proximity to D.C. should now call the Maryland Poison Center, designated the State's poison consulting center by MIEMSS. The Maryland Poison Center serves all Maryland residents, and has two 24-hour emergency telephone numbers: 410-528-7701 for the metropolitan Baltimore area and 800-492-2414 for the rest of the state.

Maryland Poison Center phones are answered by pharmacists and nurses trained as specialists in poison information. To handle the anticipated increase in calls due to the closing of the D.C. poison center, the Maryland Poison Center has increased its staff by one new full-time and one new half-time poison specialist positions.

Certified by the American Association of Poison Control Centers, the Maryland Poison Center, which is a division of the University of Maryland School of Pharmacy, receives more than 60,000 calls annually.

Poison centers are essential to EMS systems. They serve as a resource for the entire community (including the general public, prehospital care providers, and physicians) when questions exist about poisonings. For example, a poison center can direct prehospital/hospital personnel about patient treatment based on information provided and a description of symptoms; it can also guide the lay public how to directly access the EMS system when needed or sometimes even reassure parents that a substance ingested by their child was not hazardous.

Hospital personnel are urged to contact the Maryland Poison Center when they suspect a poisoning. In addition to providing consultation, the Poison Center provides epidemiologic tracking documenting the number of poisonings statewide, patient outcomes from poisonings, and side-effects of certain substances.

Guest Commentary . . . Guest Commentary . . . Guest Commentary . . .

Two EMS prehospital care providers look at EMS in relation to the changing system of health care.

Their opinions are their own and do not reflect those of particular agencies. We encourage other

providers to share their views with our readers through our Guest Commentary column.

A New EMS? Changes Are Ahead

Editor's Note: Author Joseph F. Martin III is a lieutenant in the EMS Division of the Annapolis Fire Department.

With the prospect of a new health care system dominating the agenda in both the state and national governments, are we in the EMS service ready to progress with the changes it may bring? Historically the Fire/EMS service has been an organization resistant to change. The cliché "200 years of tradition unimpeded by progress" rings true in a large majority of departments.

Most providers who work in a combination service (that is, firefighters crossed trained as paramedics) frequently feel the effects of this resistance when they suggest new ideas or concepts. From the rookie EMT fresh out of training to the most seasoned EMT-Paramedic, "a better way" of performing a skill or enhancing the care provided is met with considerable resistance. Often the status quo is preferred with the reasoning "if it ain't broke, don't fix it." President Clinton's health care reforms are providing us with a chance to reevaluate and enhance our EMS system as a whole. How much change is effected will depend solely on the leaders of the state system and our local departments.

Maryland's EMS system provides a few basic points outlined in the Clinton Health Security Act with regard to trauma care. Several trauma facilities located throughout the state provide specialty referral centers for a specific region. Local hospitals capable of handling limited types of trauma serve a more specific area. Aeromedical transport allows transport times to be kept within the patient's "Golden Hour" when referral to a specific hospital is indicated. This system keeps the high cost of providing specialized care confined to a specialty hospital, such as Maryland's R Adams Cowley Shock Trauma Center.

Fortunately the majority of calls handled by EMS do not involve patients

with life-threatening trauma requiring acute care. Calls of a medical nature account for approximately 80% of the responses handled by EMS providers. Community hospitals carry the burden of this ever-increasing patient load, with local fire departments providing the funding for prehospital services. In urban areas this prehospital service cost is funded through the tax base, but in the more rural areas it is financed through donations and fund-raisers.

With the costs of providing even basic level prehospital care increasing steadily, it is becoming more difficult for departments to maintain a continuous service at the current standard of care. In a combination Fire/EMS service, sharing the budget with the "Old Guard" of fire suppression sometimes proves to be difficult at best.

"This expansion of our role as a primary caregiver seems to be the logical step . . ."

Last budget year, with the new OSHA regulations on infectious disease control and biohazards which went into effect in September, many departments were posed with a dilemma of providing additional EMS equipment in a time of general fiscal belt tightening. This, coupled with the annual expense of training, equipment replacement costs, operating expenses, salaries, etc., required cuts to other areas. Adding to this problem was the need for technical equipment necessary to stay on the progressive side of the EMS industry. Heart monitors, pulse oximeters, B/P monitors, IV pumps, and disposable airway and resuscitation equipment, all require thousands of budget dollars.

As a chief officer once said, "back when I rode the ambulance, all we needed was a first aid kit and oxygen." This is the mindset faced by many in the EMS community. Educating the appropriate people plays a major part in getting an annual budget through the system somewhat intact, but sometimes our need for technical wizardry and the

discarding of "serviceable" disposable equipment is all but impossible to explain, let alone justify.

Now that the EMS profession has entered the electronic age and the cost of doing business has increased with a velocity never before seen, alternate sources of funding must be explored. State-sponsored programs, such as Maryland's, provide agencies with some of the equipment and support necessary to render basic and advanced level services. The provision of heart monitors and EMS communications equipment, along with the technical servicing of these items, takes a large monetary burden off the individual agencies, but the costs of providing other services get larger everyday. Anyone familiar with their department's operational budget realizes that the purchase of expendable items makes up a substantial percentage of the money required to operate annually. The dollar amount spent on oxygen supplies, equipment, and software (for example, Kling bandages and disposable products) is very taxing on the resources available.

The Clinton Health Security Act proposes that state-certified health plans be required to provide insurance coverage, through contracts with the Regional Health Alliances, for ambulance services (4,5). This proposal will give EMS agencies the ability to recoup the cost of providing prehospital service through reimbursement. With competitive insurance carriers potentially paying out large sums of money for our services, certain scrutiny will likely be placed on the type and amount of care we provide for the cost.

The task of negotiating what skills and procedures are covered through insurance benefits will fall more on jurisdictional agencies, rather than on the State system as a whole. This is due, in fact, because of a section of the act that requires smaller geographic regionalization within Regional Health

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Alliance areas (5). This section, if allowed to pass, would nullify Maryland's ability to coordinate a statewide EMS agency, under the leadership of a single board.

Funding may be a major issue in the health care reform quandary, but it certainly is not the only one. The traditional role of the prehospital care provider is one of "you call, we haul," regardless of the extent of the illness or injury. A call to 9-1-1 guarantees you a trip to the local emergency department. The emergency department doctor has become the family physician to many who do not have or cannot afford health care insurance, with the EMS service providing the taxi ride there. We should take a serious look at the service we provide to the public and make a decision as to the direction we wish to go. One section in the Health Security Act that may help us make this decision states that "no state may, through licensure or otherwise, restrict the practice of any class of health professionals beyond what is justified by the skills and training of such professionals" (5).

There seem to be three pathways from which the EMS system may choose. The first is to stay as we are and keep our programs intact, providing the same level of care and transportation currently established. The second is to scale back our roles and handle only the "priority" calls (that is, acutely ill or injured patients), allowing departments to expand and upgrade services offered to a target group. The third is to have an outside agency deciding which services are and are not covered by insurance. A more definitive reform like the third pathway is likely to occur. This is a progressive approach and would expand our roles in EMS to provide a more comprehensive health service to all patients; we would set our long-term goals to accommodate the needs of tomorrow.

At present the EMS system is an extension of the local emergency department, utilizing written protocols and on-line physician direction to provide treatment and care to all patients. This could be expanded to allow for on-scene treatment of certain patients now requiring transportation. With the ability to assess a patient's

condition and communicate our findings directly to a physician, orders could be provided and a course of treatment initiated or suggested to a patient without the need of an emergency department visit.

This expansion of our role as a primary caregiver seems to be the logical step since it utilizes all of the components of our current system as well as the written protocols and on-line physician direction familiar to most providers. It should be understood that current training standards would need to be enhanced to give providers the ability to fully assess and comprehend the patient's condition and to anticipate the treatment required. All too often the EMS community tends to be reactive to the trends and problems manifested by an ever-changing society. With the chance for change forthcoming, we should take a proactive stance and reevaluate and reorganize the system and standard of care we provide to the public. A step in this forward direction prior to the passage of any health care package should ensure an easier acceptance of our system into the program by a Regional Health Alliance. With all parties working toward the same goals of the highest quality of care and services provided at the most reasonable cost to the taxpayer, decisions on what changes should be made will be less difficult.

Since the pioneering days of R Adams Cowley, Maryland has always been a leader in the prehospital field and, with our continued efforts, will remain a leader for the rest of the nation. **EMS as the first step in the echelons of care** should remain a prime focus when the decisions of health care reform are made in Annapolis and in Washington, DC.

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Health Care Reform & EMS

Editor's Note: Author David J. Heikkila is a SYSCOM and EMRC communications operator at MIEMSS. He has worked as a career firefighter/paramedic and also in the commercial sector. The following was submitted as excerpted from his research paper on the evolution of EMS operational systems and Clinton's Health Security Act.

What will be the effect of health care reform on EMS? First, as author Doug Wolfberg states in "Resuscitating the Health Care System: What Will the American Health Security Act Mean for EMS," the plan states that "emergency services" and "ambulance services" are proposed covered benefits, including air transport, but air transport only in cases in which other means of transportation are contraindicated by the patient's condition. The plan will not cover services that are not medically necessary, whether they involve air, land, or sea transportation.

“. . . the plan may trigger in some areas a return to the days of ‘ambulance races’ and ‘wars’ . . .”

Although current health insurance plans do not cover unnecessary services, providers of EMS that rely on third-party reimbursement (commercial and some public ambulance providers) will come under even closer scrutiny and will need to better document the medical necessity for reimbursement in the future. Better documentation of medical necessity also will be needed because the [Clinton] plan prohibits the patient from being billed for any services that are not approved by the health alliance. This, together with the fact that virtually everyone will have "EMS insurance" (this writer's term), is sure to have some profound effect on EMS operational and reimbursement systems for the future.

One result of "universal" health insurance is that commercial providers will no longer have to refuse to provide services to the uninsured or those without cash. In many respects, the

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Delaplaine Heads EMS Advisory Council

Governor William Donald Schaefer recently approved the appointment of George B. Delaplaine, Jr., of Frederick, as chairperson of the 27-member EMS Advisory Council. This council is the principal advisory body to the state's 11-member EMS Board, which oversees MIEMSS and is ultimately responsible for the coordination of all

emergency medical services in Maryland.

Mr. Delaplaine is not new to EMS. He was twice past president of Maryland's Region II Emergency Medical Services Advisory Council of which he has been an active member for over 20 years; in addition, he served for more than nine years as the

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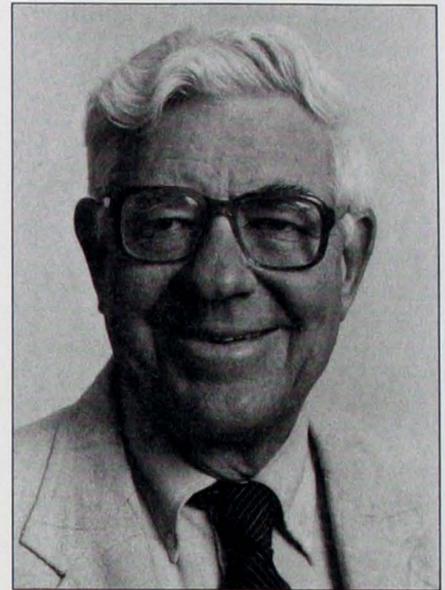
commercial ambulance providers will be able to compete much more directly with their counterparts, the public EMS providers, for the health alliance contracts and patients. (In fact, in the short term, the plan may trigger in some areas a return to the days of "ambulance races" and "wars" regarding the transport of patients. But this, too, will eventually cease when communities focus on quality and not just cost.) Public providers that rely on taxes or fund-raisers for reimbursement rather than on insurance reimbursement will, in many ways, be forced by their taxpayers to defend their service as never before. The public EMS providers who have competent administrators and managers and have educated their citizens on EMS as a system will have less to defend. But those that have emphasized *ambulance transportation*, whether it be basic life support (BLS) or advanced life support (ALS), will have to change to being insurance reimbursed, return tax dollars, and compete with commercial ambulance providers, or become an integral part of the EMS system and promote this to their citizens.

An EMS system is one that emphasizes prompt emergency care (both BLS and ALS) and ambulance transportation as separate parts of the overall system. Often referred to by EMS gurus as a "cadillac," it is a system that combines both public and commercial, career and volunteer components into one cohesive system of EMS and disaster preparedness. It is a system that places quality of care above ambulance transportation.

Other operational and reimbursement changes for EMS will include switching to the standard health insurance claim form, providing new services such as those described by Marion Garza in "Inside EMS: Paramedics Expand Skills for Unique HMO Ambulance"; uniform data collection and reporting; increased emphasis and development of highly technical regional trauma centers similar to Maryland's R Adams Cowley Shock Trauma Center; and an increased use of field pronouncement of death and do-not-resuscitate (DNR) programs. These changes primarily will occur due to the economic and political realities of our current health care system and the support President Clinton has for change.

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George B. Delaplaine, Jr.

Region II EMS representative for REMSAC (Regional EMS Advisory Council).

Mr. Delaplaine is president of a family owned corporation, Great Southern Printing & Manufacturing Co. of Frederick, which owns and operates *The Frederick News-Post* and also owns Frederick Cablevision, Inc. and three other cable companies in nearby Pennsylvania, Virginia, and West Virginia. He also serves as editor and publisher of the Frederick dailies.

Currently a director of Farmers and Mechanics National Bank and vice president and director of the Frederick Brick Works, Mr. Delaplaine served for 12 years as director of Maryland Blue Shield Inc. and served as president of the Maryland-Delaware-D.C. Press Association and president of the Maryland-Delaware Cable TV Association. He was also chairman of the Maryland State Press Association's legislative committee for 14 years.

Mr. Delaplaine has been active in many civic organizations and has been honored many times. For example, in 1991, he received the "Addy" award in recognition for his contribution to advertising; in 1992, he was honored with the President's Medal at Mount Saint Mary's College, as well as Frederick's prestigious "Golden Hand of Friendship" award; and in 1993, he was inducted into the Maryland-Delaware-D.C. Press Association's Hall of Fame.

Asthma: Causes and Treatment

Editor's Note: Author Murray A. Kalish, MD is a member of the EMS Advisory Council, an Assistant Professor of Anesthesiology at the University of Maryland School of Medicine, and an attending anesthesiologist at the R Adams Cowley Shock Trauma Center.

Asthma is a lung disease caused by inflammation of the airway, leading to hyperresponsiveness and obstruction. The inflammation results in epithelial disruption, mucosal edema, and release of inflammatory mediators. This airway inflammation is a major factor in airway hyperresponsiveness, which is an exaggerated bronchoconstrictor response to such things as allergens, environmental irritants, viral respiratory infections, cold air, or exercise. Airway obstruction is responsible for the clinical manifestations of asthma, which include episodic wheezing, dyspnea, and cough.

Use of Anti-inflammatory Agents

The treatment of asthma has two components. The first is administration of anti-inflammatory agents, which interrupt the development of bronchial inflammation and are used prophylactically. Corticosteroid agents, either taken orally or inhaled, are used for short-term or long-term therapy. Their mechanism of action in suppressing inflammation and decreasing bronchial hyperresponsiveness is incompletely understood. Oral corticosteroids are associated with many adverse effects compared with inhalants. These effects include abnormal glucose tolerance, weight gain, increased appetite, fluid retention, rounding of the face, mood alteration, hypertension, peptic ulcer,

cataracts, bone demineralization, purpura, dermal thinning, and oral and esophageal candidiasis.

Cromolyn sodium and nedocromil are used prophylactically from metered-dose inhalers. These agents are chemically unrelated, but both prevent the release of mediators from mast cells. They have no bronchodilation effects, and side effects are minimal.

Use of Bronchodilators

The second component of treatment is the use of bronchodilators. These are divided into three groups: sympathomimetics, xanthene derivatives, and anticholinergics. First, of the sympathomimetics, the selective β_2 -agonists are preferred; they relax airway smooth muscle without cardiovascular side effects, as compared to isoproterenol (β_1 - and β_2 -actions). The preferred route of administration is inhalation to produce better bronchodilation and fewer systemic adverse effects (e.g., cardiovascular stimulation, anxiety, and tremor). Examples of β_2 -agents are albuterol (Proventil, Ventolin), terbutaline (Brethaire), formoterol, and salmeterol.

Second, the xanthene derivatives are bronchodilators that may act by inhibiting phosphodiesterases. Theophylline, the principal methylxanthene, may also reduce respiratory muscle fatigue and have some anti-inflammatory activity. Aminophylline, the water-soluble salt of theophylline, has a serum therapeutic range of 10-20 $\mu\text{g}/\text{ml}$. Toxicity signs are tachyarrhythmia, hypotension, convulsions, vomiting, headache, hypokalemia, hyperglycemia, nervousness, insomnia, tremor, and neuromuscular irritability. The oral form is Theo-dur.

Third, the anticholinergics are weak bronchodilators. Their mechanism of action is reduction of intrinsic vagal tone and blockage of the reflex bronchoconstriction caused by inhaled irritants. One such agent is ipratropium bromide (Atrovent), which is a quaternary derivative administered from a metered-dose inhaler. Ipratropium has no anti-inflammatory activity and does not decrease bronchial hyperresponsiveness. It is used to supplement β_2 -agonists or theophylline in some patients. Intravenous administration of atropine, even in appropriate doses, elicits undesirable

cardiovascular and central nervous system effects.

Intubation of Asthmatic Patients

If the asthmatic patient develops respiratory failure, the orotracheal route of intubation is preferred. But prehospital care personnel may encounter problems when establishing intubation. Postintubation tachyarrhythmias may be seen in the asthmatic patient but are usually transient. These may be related to stress, the release of catecholamines, hypoxia, acidosis, alkalosis, hypokalemia, or the toxic effects of β -adrenergic receptor agents and theophylline derivatives used to treat asthma.

Hypotension associated with tension pneumothorax may occur and should be included in the prehospital assessment algorithm. The treatment is immediate needle thoracostomy.

If orotracheal intubation is not feasible and prehospital personnel are directed to nasotracheally intubate a failing asthmatic, they should gently insert a well lubricated nasotracheal tube.

Nasal bleeding may occur, particularly in patients on chronic steroid use.

Asthma is a disease frequently encountered by prehospital care providers. It is easy to be complacent and undertreat the failing asthmatic. Remember that asthma can be life-threatening and should always be managed proactively.

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EMS Care '94 will be held at the Omni Inner Harbor Hotel in Baltimore. Preconference activities are scheduled for April 28-29; conference activities, for April 30-May 1. EMS Care '94 is sponsored by MIEMSS and the Region III EMS Advisory Council; it is being hosted by the Baltimore City Fire Department. For information, call MIEMSS at 410-706-3996.



Governor William Donald Schaefer

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Emergency Medical Services Systems

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

Chairman, EMS Board: Donald L. DeVries, Jr., Esq.

Administrative Director, MIEMSS: John M. Murphy

Acting State EMS Director, MIEMSS: Richard L. Alcorta, MD

Managing Editor: Beverly Sopp (410-706-3248)

Address Correction Requested

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DATED MATERIAL

Emergency Medical Services Week: May 15-21

The Maryland EMS community will join with EMS providers nationwide to celebrate Emergency Medical Services Week, May 15-21, 1994. This year's theme, "Emergency Medical Services: The Stars of Life," focuses on the 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 two goals of EMS Week are to increase public awareness about EMS and to recognize the thousands of career and volunteer personnel who comprise the EMS system. MIEMSS is coordinating statewide efforts to organize EMS Week events. Many prehospital and hospital providers will focus on activities to educate the community about the EMS system—what it is, how and when to use it appropriately, how to recognize a medical or traumatic emergency, and how to give first aid, 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.

Detecting Injuries When Air Bags Are Used

Editor's Note: A "Research Note" published by the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) reports that drivers protected by air bags and safety belts often do not have visible injuries. However, they could have serious internal injuries that might be fatal if not detected and treated appropriately and promptly. The following suggestions for improved internal injury detection were offered to prehospital care providers in NHTSA's "Research Note."

One "tell-tale" indicator of injury is deformation of the steering wheel. In the case of a motor vehicle crash in which an air bag has deployed, rescue personnel should **lift the deployed air bag** and make a visual check of the steering wheel. Thus a quick "**lift and look**" under the air bag should be a part of the routine examination of the steering wheel. Any visible deformation of the steering wheel

Nominations for individuals to receive awards will be accepted through March 31. Please contact your MIEMSS regional administrator for additional information.

This year also marks the 20th anniversary of the national celebration of EMS Week, which first began in 1974.

should be regarded as an indicator of potentially serious internal injury, and appropriate action should be taken.

Steering wheel deformation under the air bag should be used in triage decision making as a **supplementary, but not sole, indicator** of the possibility of internal injuries. Since steering wheel deformation varies with differing interior design characteristics of vehicles, conditions of the crashes, and occupant kinematics, internal injuries may still be present whether or not the steering wheel has been deformed. The potential for internal injuries is also related to the age, size, and health status or physical condition of the occupant.

REMINDER

Please remember and remind others that the air bag does not replace the seat belt. The air bag is a device to augment the protection of the seat belt. It is imperative that both the seat belt and the air bag are used for occupant protection.