



Maryland EMS NEWS

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In one of the first attempts at mouth-to-mouth resuscitation following AMA sanction of the technique (1960), Baltimore ambulance crew members resuscitated this infant, allaying many doubts that the method was safe and effective. A team of Baltimoreans including Chief Martin McMahon developed the technique at Baltimore City Hospitals. (Photo courtesy of Chief Martin McMahon)

Chief Marty McMahon: Legacy of 'Firsts'

In 1940 when Martin McMahon joined the Baltimore City Fire Department, there were no EMTs — only ambulance driver/attendants who were promoted from the ranks of firefighters and had some limited first-aid training. Their response to a call for emergency medical assistance was usually a "scoop and run" to the nearest hospital, with attendants administering only the simplest treatments.

But by 1975 when he retired, McMahon had served as chief of the Baltimore City Ambulance Service for 25 years, and prodded its development into one of the finest in the nation.

After becoming captain of the ambulance service in 1951, Chief McMahon initially became dissatisfied with the lack of training for ambulance personnel. "I thought we should be a little more [medically] educated than the people we pick up," he said.

The first major advance in emergency care in Baltimore came when Chief McMahon, Robert Wilder, MD (then a surgical resident at Baltimore City Hospitals), and Peter Safar, MD (then chief of anesthesiology at Baltimore City Hospitals), worked to perfect mouth-to-mouth resuscitation, at the same time closed chest cardiac compression was being developed at the Johns Hopkins Hospital. "Before mouth-to-mouth we had other methods

of resuscitation, but we were never sure whether they were working. . . . In fact, it's my opinion that the patients survived in spite of those efforts, not because of them," Chief McMahon said.



How can prehospital care providers keep abreast of the dynamic changes in EMS field care concerning law, protocols, techniques, and technology? In response to this question, MIEMSS will present "EMS Care '84," a one-day educational conference in Baltimore, on Saturday, June 9.

Participants will be able to choose from many concurrent workshops which will provide the most up-to-date information available to assist in maintaining the high level of prehospital care in Maryland. Included in the \$10 registration fee are lunch and parking.

This will be an exciting conference! Mark your calendars now for this event. Flyers are being developed which will be mailed to those who receive the *Maryland EMS News*. For more information, contact your EMS regional administrator.

In 1958 mouth-to-mouth became the first resuscitation technique sanctioned by the American Medical Association. Shortly after crews began using the new technique, a non-breathing baby was easily resuscitated and saved, allaying many doubts that the method was safe and effective. To assist with resuscitation, Chief McMahon developed a prototype of an S-shaped plastic airway in his basement workshop, which the Johnson and Johnson Company later manufactured. It is still in use today.

Soon after the mouth-to-mouth technique was perfected, a boy working in a grocery store got his hand caught in a meat grinder. Then-Captain McMahon was on the scene and ran to get a doctor across the street. Even though the "good samaritan" law was already in effect, the doctor wouldn't help because he feared a malpractice suit. "I was hot and really angry," the retired chief remembered, "and told Dr. Wilder." Both men became interested in developing better prehospital care for the seriously injured.

The concept of "emergency squad doctor" was an outgrowth of Dr. Wilder's and Chief McMahon's concerns about the quality of prehospital care. "[Dr.] Wilder was really the first emergency squad doctor. He stuck his neck out and rode on

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the ambulances until the city said 'go ahead,' and then the other hospitals began," Chief McMahon recalled.

For at least 15 years a police car or ambulance would transport the emergency squad doctor to the accident scene to treat specially designated cases. After treating the patient, the physician would ride back to the hospital in the ambulance. After the program was accepted, Dr. Wilder trained emergency squad doctors in Baltimore city. This was the first involvement between ambulance personnel and physicians. The concept of "emergency squad doctor" is still used today, although not extensively.

In the late 1950s and early 1960s, many changes were made in the way emergencies were handled in Baltimore. Dr. Wilder and Chief McMahon continued working together, and in early 1960 they sponsored the first training program for ambulance drivers and attendants. Chief McMahon organized the classes, ensured the attendance, and set up the program, while Dr. Wilder supplied the physician instructors for each topic.

"That training was a real turning point in prehospital care," Chief McMahon assessed. "Within two years we had participants from all over Maryland, from across the country, and even from foreign lands. There was never a charge for any of the training, which we repeated twice each year. Initially it was mandatory in Baltimore city, and later in Anne Arundel and Baltimore counties."

Early training programs included sessions on resuscitation and on handling fractures, bleeding, behavioral emergencies, and childbirth. "The men had always been afraid of assisting in the delivery of a baby, and one attendant actually passed out during that segment of the program," Chief McMahon chuckled. "But it wasn't as bad after the training since they had a better understanding of the procedure." In addition to the local training programs, Chief McMahon coordinated several of the first national ambulance conferences which were held in Baltimore.

Dr. Wilder, who is currently director of emergency medicine and the trauma center at the University of Oklahoma, recently returned to MIEMSS for several months as a visiting fellow. He remembered Chief McMahon as someone who knew what had to be done and went ahead and did it, regardless of the red tape involved. "He was a dynamo. He saw the real need for a physician to respond in certain emergency situations and he worked for months to identify the proper physicians to assist him," Dr. Wilder said. "Our interest in ambulance work as a result of studies on mouth-to-mouth resuscitation and closed chest cardiac compression made us ideal for the project.



(L-R) Chief McMahon and Robert Wilder, MD, demonstrate the use of the S-shaped airway that Chief McMahon developed at one of the early training seminars for ambulance attendants. (Photo courtesy of Chief Martin McMahon)



(L-R) Robert Wilder, MD, and Jim Jude, MD, demonstrate one of the original Resusci-Annies at an ambulance training session in 1962. Baltimore was honored as the first American city to have a demonstration of a Resusci-Anni. (Photo courtesy of Chief Martin McMahon)

"McMahon created the fine ambulance service that Baltimore has today, as well as the beginning of the paramedic service as we know it," Dr. Wilder said. "He was always willing to look at new ideas and new techniques. This man was not an office jockey — he worked with and supported his men to create the best pre-hospital care system."

In 1962, Baltimore was honored as the first American city to have a demonstration of a Resusci-Annie. This demonstration, a result of the efforts of Chief McMahon and Dr. Safar, took place during the annual spring ambulance training program. Gradually the ambulance training program evolved into the state's EMT training program, and Chief McMahon served on the board that developed and implemented the program. He also served on the board of the National Research Council, working both on the issue of mouth-to-mouth resuscitation and on the development of ambulance standards.

Chief McMahon first met R Adams Cowley, MD, director of MIEMSS, in 1964 when Dr. Cowley approached him about utilizing the hyperbaric chamber to help victims of smoke inhalation. Chief McMahon vividly recalled one of the first major uses of the hyperbaric chamber — for a lion tamer with the circus. "When the lion tamer was clawed there was grave concern since the secretion under the lion's claws is extremely toxic," he said. "We brought him to University Hospital and he developed gas gangrene. Dr. Cowley's hyperbaric chamber was used to treat the patient and his arm was saved.

"Cowley was at University Hospital working on his trauma cases way before we on the streets ever thought of anything," Chief McMahon said. As their relationship developed, Dr. Cowley began bringing ambulance crews into his unit to teach them about treatment after transport.



Providing a look at what happens to patients after they reach the hospital, Robert Wilder, MD, explains patient treatment to ambulance crew members. The in-hospital training was an outgrowth of Dr. Wilder's and Chief McMahon's concerns about the quality of prehospital care. (Photo courtesy of Chief Martin McMahon)



Baltimore City paramedics Wayne Geldmack and William Hall show Chief McMahon the sophisticated equipment now carried on ambulances. The design of the box-type ambulance and the S-shaped airway are among Chief McMahon's accomplishments. (Photo courtesy of Chief Martin McMahon)

When the Shock Trauma Center first opened, nothing was easy, according to Chief McMahon. Many people in field services were skeptical about the new system, but Dr. Cowley was able to win them over by personally attending meetings with various companies to sell his ideas.

One of the most difficult hurdles was convincing field personnel that ground vehicles were not necessarily the best means of transport. You could get the patient the needed specialties much quicker and easier by flying to the Shock Trauma Center.

"In the early stages of the Maryland State Police Med-Evac helicopter program, pilots weren't really trained yet on what to do at the scene, so Cowley and I developed the idea of a pilot and a medic," he said.

According to Chief McMahon, infighting was rampant in the early days, as

most fire companies didn't want their glory taken away by the State Police and Cowley's new system. Change was finally forced when the Department of Transportation (DOT) mandated certain procedures to be followed if EMS programs wanted to receive federal financial assistance.

Dr. Cowley and Chief McMahon also worked on developing new standards for ambulances, and the box-type ambulance was the result.

While participating in these local and national projects, Chief McMahon continued to direct Baltimore City's ambulance service. Lou Jordan, associate director of prehospital care at MIEMSS, worked as an ambulance driver/attendant under Chief McMahon for 10 years. Mr. Jordan said he believes that much of the success in EMS today is directly attributable to Chief McMahon.

"He had the savvy, experience, and know-how to direct us and to integrate our ideas into the system," Mr. Jordan ex-

plained. "He taught us how to apply our desires and abilities, while offering us what we couldn't get — years of experience. We could disagree and argue with him and he would always listen, and we never had to worry about him taking revenge on us for disagreeing.

"McMahon understood how to recognize and utilize his men's strengths and work with them on their weaknesses, and I think this was why he was so successful. Wherever I travel, I am asked about the chief. He is truly world renowned," Mr. Jordan noted.

Chief McMahon, Mr. Jordan, and one other Baltimorean became the first EMTs in Maryland after attending a federally sponsored training program in 1972. At that time there were only 116 EMTs nationwide.

In 1974 Baltimore City received the first DOT grant in Maryland — one quarter million dollars to upgrade and improve ambulances and telecommunications and to initiate a telemetry system. Chief McMahon had helped to draft the grant proposal and was proud to claim, "we finally got OB into a grant for the first time. DOT had never even considered it before, but we argued that pregnant women are in accidents too, and were able to get equipment and training for OB emergencies in our program."

In June 1975, just before Baltimore's telemetry system became operational, Chief McMahon retired. He had worked for the Baltimore City Fire Department for 35 years.

Times have changed drastically since he began working in the Gay Street station with its one truck. But he leaves a legacy of accomplishments: the S-shaped airway that he developed and that is still used; a manual on closed chest cardiac compression that was distributed nationwide; a selection of equipment including an orthopedic back stretcher that he helped to remodel for emergency medical field care; the square-box ambulance module used today that Dr. Cowley and he designed nearly 20 years ago.

These days Chief McMahon is happy in his retirement, and active in the fire department retirees' association. He keeps up-to-date on fire department news through frequent conversations with former colleagues and with his son, Denis G. McMahon, battalion chief of the communications bureau, Baltimore City Fire Department. "I always took care of my segment of things as best I could," he said. "I had my day in the sun, and I never meddle now."

— Rochelle Cohen

Bretylium: What It Does, Why It Works

Thomas C. Majerus, PharmD, chief of clinical pharmacology at MIEMSS, will be writing a column on drugs that pre-hospital personnel use to treat patients. His column will appear frequently in the Maryland EMS News.

This month's column is on bretylium, and the algorithms described are according to American Heart Association guidelines.

In December 1983 the Board of Medical Examiners of the State of Maryland approved the addition of bretylium tosylate to the complement of medications carried on mobile intensive care units in Region V. Bretylium tosylate (proprietary name: Bretylol) possesses unique anti-fibrillatory effects that have increased the chances for patient survival when used early, along with other standard therapies of unmonitored ventricular fibrillation.

The drug was originally developed as an antihypertensive drug, but had limited usefulness. Serendipitously it was found to have antidysrhythmic properties that proved most useful. The properties have been described as chemical defibrillation as well as promotion of electrical defibrillation along with suppression of ectopic foci. Further research has suggested that bretylium may decrease the incidence of asystole.

Bretylium is a compound with sympathetic-blocking properties and antidysrhythmic effects, along with a positive inotropic action. Its effects on the cardiovascular system are biphasic, probably caused by a bretylium-mediated norepi-

nephrine release followed by a bretylium blockade of norepinephrine reuptake by nerve endings. Therefore, there is an initial increase of circulating norepinephrine levels with its attendant alpha-1 (arterial blood pressure rise) and beta-1 (myocardial contractility increases) effects. With the subsequent blockade of norepinephrine reuptake, the free norepinephrine is metabolized and a sympatholytic effect is seen. That is, the increases in arterial blood pressure and myocardial contractility are reversed.

The effect of bretylium is analogous to that seen when a truck stops on a water hose through which water is running. In this case, consider the truck as the bretylium, the water hose as the nerve, and the running water as norepinephrine. When the truck stops on the hose, there is a short, increased surge of water from the end of the hose followed by no flow. Similarly, bretylium causes a sudden increased release of norepinephrine (a sympathetic—alpha-1 and beta-1) followed by a sympatholytic effect.

Bretylium has been shown to increase the ventricular fibrillation threshold (as does lidocaine). For normal depolarization and repolarization to occur, a balanced relationship between the action potential duration (APD) and the effective refractory period (ERP) is critical. With injured or infarcted myocardial tissue, the disparity between the APD of both types of myocardial tissues may permit reentry.

Bretylium acts as an equalizer in the myocardium by causing the normal cardiac action potential to approximate the cardiac action potential of the infarcted or injured tissue. In other words, the electrical effect of bretylium is greater on normal myocardial tissue than it is on the infarcted tissue. Regardless of the change that results, the disparity between the APD and the ERP between the normal and infarcted tissues lessens and the chance of reentry is diminished. Before bretylium is administered, normal myocardial tissue will repolarize in slightly less than 1/4 second and infarcted tissue will repolarize in approximately 0.3 second. After bretylium is administered, this difference is lessened so that normal tissue will take longer to repolarize and do so more in synchrony with the infarcted tissue.

Bretylium is used to treat ventricular tachycardia refractory to other therapy and ventricular fibrillation. Bretylium is indicated early in the pharmacological manipulation of ventricular fibrillation and is

probably as effective as lidocaine in the management of this dysrhythmia.

In reviewing the algorithm for unmonitored ventricular fibrillation, one sees that after appropriate electrical defibrillation and after epinephrine and sodium bicarbonate administration, bretylium is administered as a 5 mg/kg IV bolus (dosage range: 350 mg to 500 mg). Subsequently, after further defibrillation and appropriate CPR maneuvers, bretylium is administered as a 10 mg/kg IV bolus (dosage range: 700 mg to 1000 mg). While the algorithm states that bretylium is administered subsequently as a 10 mg/kg IV bolus every 15 minutes, in practice one should probably administer it more frequently (every 8 to 10 minutes). More frequent administration such as this may be appropriate. Bretylium is provided as a 500 mg (10 ml) ampule to provide the 7 to 10 ml initial dose. Remembering that subsequent doses are twice the initial dose will allow adequate supplies of bretylium to be available for use.

Bretylium tosylate has been proven to be valuable for patients in or at risk of ventricular fibrillation. Also, used appropriately, it is useful for the treatment of ventricular tachycardia refractory to other forms of therapy. The key word in the use of bretylium, however, is that it must be used *early* during the treatment of ventricular fibrillation.

—Thomas C. Majerus, PharmD
Critical Care Medicine, MIEMSS

Region II

Trauma Days

Don't forget the annual "Trauma Days" program on May 10, 11, and 12, at the Frederick Sheraton Inn. Nursing tracks on trauma are scheduled for Thursday, the 10th; nursing/field tracks, for Friday; and field tracks, for Saturday. Contact your regional office for more information.

Ambulance Parking

Now that spring is in the air, don't forget the courtesy of cutting your lights when you are parked at the hospital. Remember, our neighbors deserve special consideration.

ALS Coordinator

Since early February, Region II has had the services of a full-time ALS coordinator, Bill Metcalf. Bill is located at Washington County Hospital and can be reached at (301) 824-8265 if you have any questions regarding ALS or continuing education for Region II.

—Mike Smith, (301) 791-2366

EMS Legislation

The 1984 legislative session of the Maryland General Assembly considered more than 200 bills that impact on emergency medical services in Maryland. Several bills reflect emerging trends on EMS issues or refinements of the EMS system. Other bills, such as drunk driving legislation and the repeal of the motorcycle helmet law, reflect ongoing concerns of EMS providers in Maryland.

The continued funding needs of the field programs are addressed in Senate Bill 956. This bill would establish an emergency medical services fund by charging an additional \$3 for registration fees for all vehicles in Maryland. Thirty percent of the funds would be distributed directly to the local jurisdictions, and an additional 10 percent would be used for supplemental

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Region IV

ACLS Courses

The Peninsula General Hospital Medical Center in Salisbury will be conducting its third advanced cardiac life support (ACLS) course for 1984 on May 5 and 6. The medical director for this program will be Louis H. Himes II, MD. Susan Greenleaf, RN, the program coordinator, indicated that 27 individuals were certified in their January program under the direction of Clayton L. Raab, MD. The medical center is extremely pleased with the participation and high success rate of those attending the ACLS program.

PGHMC is most anxious to expand the ACLS provider corps on the Eastern Shore. In addition, it hopes that its instructor corps can be increased so that this program can reach even more EMS providers and enable the Eastern Shore to be self-sufficient in providing ongoing ACLS programs.

The Dorchester General Hospital in Cambridge has also recently conducted a successful ACLS course, and expects to certify 13 candidates. The physician director was Anne Wilke, MD, and the program coordinator was Sue Davis, RN, in-service education coordinator at Dorchester General Hospital. Mrs. Davis indicated that, based on the success of this program, plans are being made for another program in the fall.

CRT Classes

Region IV is also pleased with the progress of the current CRT class being conducted at Peninsula General Hospital Medical Center. Preston (Billy) Bounds is the instructor for this class, which will be participating in the April CRT state board exams. Good luck!

The Union Hospital of Cecil County in Elkton is also planning to hold a CRT class beginning in March. The instructor for this program will be Frank Muller and his class will be preparing for the July state board exams. Fifteen students have successfully passed a screening examination process and have been approved for training by their ambulance companies and the Cecil County Ambulance Committee.

Dr. John C. Arrabal, Jr.

Region IV is pleased to welcome John C. Arrabal, Jr., MD, as director of emergency services at the Kent and Queen Anne's Hospital in Chestertown. Dr. Arrabal has an excellent medical background and is firmly committed to supporting our EMS system. He has already been active in upgrading continuing education provided to the local EMT-As responding into the Kent and Queen Anne's

Hospital. Together with the Region IV Office, he has instituted an ongoing case review process that has been well received.

Helicopter Demo and Workshop

Finally, the Region IV Office with Union Hospital of Cecil County, Kent and

Queen Anne's Hospital, and the Maryland State Police Aviation Division recently hosted a helicopter demonstration and workshop in Cecil and Kent counties. Thanks go out to Anne Smith, RN, and
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Region V

Ambulance Charges Proposed

In response to numerous phone calls to the Region V Office regarding the proposal of the Prince Georges County Fire Department to charge for ambulance service, the PG County Fire Department has provided us with the following information to explain the proposal to our newsletter readers.

The PG County Fire Department has proposed an expansion of their advanced life support (ALS) program funded through service fees for ambulance transports. Currently the ambulance service in Prince Georges County, which includes 37 ambulances and 4 mobile intensive care units (MICUs), provides service free of charge. During fiscal year 1983, these units responded to 42,283 medical emergencies. However, because of fiscal limitations within the county, only 60 percent of the county currently receives ALS services.

Fee for service in government-run ambulance services is not a new idea. In Maryland, both Ocean City and Cumberland charge, as do neighboring jurisdictions such as Washington, DC; Arlington County; and Alexandria. Prince Georges County proposes to charge \$50 for transport by basic life support ambulances and \$75 for transport by ALS units.

The additional funds generated will be used to provide countywide ALS coverage, with 12 MICUs projected to be in service by 1987. In addition, a countywide CPR training program will be initiated with the goal of training 350,000 county residents in seven years. The PG County Fire Department estimates that MICU response time to the scene will be reduced by nearly 50 percent and that this shortened response time coupled with widespread citizen CPR training may save as many as 200 additional lives every year. Strengthening the EMS service will also strengthen fire suppression by freeing up firefighters and thus decreasing understaffed fire responses.

PG County's new ALS system includes many recommendations developed by a special task force in 1980. In addition to the expansion of ALS services,

the proposal calls for the eventual specialization of MICU crews, the return of career firefighters to suppression activities, and paramedic level hiring into the fire service. An incentive program to promote volunteer participation will include a stipend to ambulance companies on a per member/per ambulance call basis.

While the PG County Fire Department will continue to provide transport to anyone needing the service, the status of the Good Samaritan Law is in question. According to a PG County Fire Department spokesman, if good samaritan coverage is lost, the county is prepared to provide malpractice insurance.

This proposal will be considered by the Prince Georges County Council this spring.

Hazardous Materials Conference

The Second Annual Conference for Hazardous Materials Response Teams, sponsored by the Montgomery County HIRT, will be held on May 11-13. Special EMS workshops will be included in the program. For further information, contact: Hazardous Incidents Response Team, c/o Chevy Chase Fire Department, 8001 Connecticut Avenue, Chevy Chase, MD 20815.

Congratulations . . .

On March 10, the 2nd District Volunteer Rescue Squad, in Prince Frederick, held their annual awards banquet. Marie Warner, Region V administrator, addressed the banquet on "EMS: Past, Present, and Future." Following her speech, Ms. Warner presented Chief Warren Parks with certificates of recognition for the Volunteer Ambulance Inspection Program. Both of the squad's ambulances passed inspection. Second District was the first rescue squad in Calvert County to request inspection and only the second in Southern Maryland.

Bowie Rescue Squad became the first unit in Prince Georges County to undergo volunteer ambulance inspection. They received final approval on February 29.

— Marie Warner, Ed Lucey
(301) 773-7970

Organ Procurement Center: Matchmaker

In Baltimore, a five-year-old girl dies from the complications of flu and a head injury.

In Pittsburgh, Minneapolis, and Miami, children are saved from debilitating disease and eventual death because of the organs they received from the girl in Baltimore.

This happens every day. One person, whose life could not be saved, in death, gives a new life to one or more other people. In this state, it is made possible by the Maryland Organ Procurement Center.

The center, located at the University of Maryland at Baltimore, has been in operation since January 1983. Before that, the job of procuring and transporting donor organs and of finding appropriate recipients for the organs was split between the University of Maryland, Johns Hopkins, and Baltimore City hospitals.

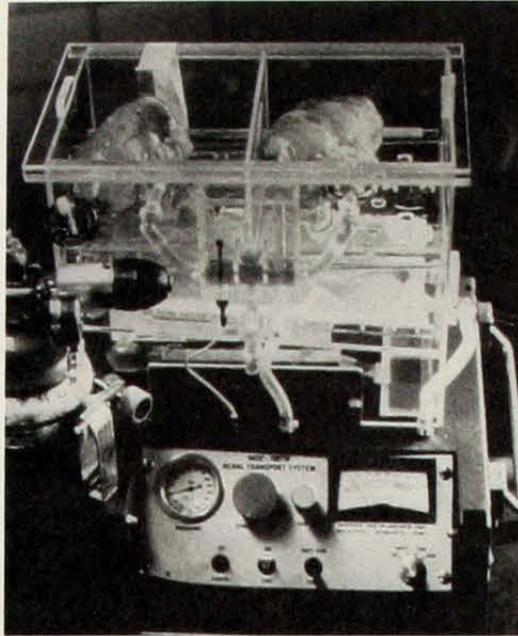
The Board of Directors of the center consists mostly of physicians primarily from those three hospitals. The medical director of the center is Fuad Dagher, MD, who is chief of transplant surgery and professor of vascular surgery at University of Maryland Hospital.

The center was located on the University of Maryland at Baltimore campus because most of the organs acquired by the center come from the MIEMSS Shock Trauma Center.

Of the 78 organs acquired by the Organ Procurement Center in its first year of operation, half came from Shock Trauma Center patients. Most of the remaining organs (44 percent) came from the following areawide trauma centers: Johns Hopkins Hospital, Baltimore City Hospitals, Washington County Hospital, and Peninsula General Hospital Medical Center.

The administrative details involved in procuring organs is handled by a staff of three coordinators. One of them, Pam Minkosky, RN, worked at the Shock Trauma Center for about seven years as a nurse in the critical care recovery unit and in the operating rooms. The senior coordinator, Bob Grant, formerly worked in the transplantation department at the Walter Reed Army Medical Hospital in Washington, DC. Arthur Kurz is the third member of the team. He worked in the organ procurement program and ran a dialysis unit in the Air Force before he joined the staff.

Their job consists of identifying potential organ donors among the brain-dead patients in Maryland hospitals; requesting permission from the patient's next of kin and from the medical examiner



A perfusion pump can keep kidneys functioning for about 72 hours until they can be implanted in the waiting recipient.

to remove the usable organs; locating appropriate recipients for the organs; arranging to have the organs removed and assisting in that process; packaging the organs for transport; and arranging for transport.

The center's administrator is Dave Kappus. Previously, he worked in the tissue typing laboratory at Johns Hopkins Hospital. He also fills in as a coordinator when one of the regular coordinators is out.

The Organ Procurement Center deals mainly in kidneys, which represented 92 percent of the total number of organs obtained in 1983. The remainder consisted of hearts and livers. Even so, the difficulty in obtaining a kidney for a waiting recipient can be greater than that involved in getting either of the other two organs.

For information regarding organ donation, or to make donor referrals, please call the Maryland Organ Procurement Center, Inc. at (301)528-3626. This phone is staffed 24 hours a day to answer calls.

This paradoxical situation is explained by the fact that the demand for kidneys is also much greater than the demand for hearts and livers. For every patient waiting for a heart or liver at any particular time, there are 160 to 200 people waiting for kidneys.

The reason is that the lives of patients with end-stage renal disease can be prolonged indefinitely by dialysis. Since maintenance therapy does not exist for

patients with terminal liver or heart disease, these patients die if they do not receive a donated organ right away. Consequently, the number of people needing kidneys grows continuously, while the number of patients who need a heart or a liver remains relatively constant.

Adding to the irony of the situation, sometimes there are more hearts and livers available for transplantation than can be used. That is because it is not always possible to find a potential recipient with the exact blood type and body weight within the time constraints.

Timing is critical in coordinating transplantations of hearts and livers because these organs die within hours of their removal from the donor's body. The maximum amount of time that may elapse between removal and implantation is six hours for a heart and nine hours for a liver.

Whenever a heart becomes available and is compatible, it is rushed to Johns Hopkins Hospital, the only hospital in Maryland where heart transplant surgery is performed. The transplant operation at Hopkins must be timed with the operation to remove the donor's heart so that the surgeons at Hopkins are ready to implant the heart when it arrives.

The timing can be extraordinarily delicate when the organ has to be transported out of state. To facilitate long transports, several corporations in Maryland have donated the use of their Lear jets and the cost of paying pilots to fly the aircraft. Unfortunately, these jets are not always available to perform this service; in such cases chartered air transportation is used.

Kidney transplants do not present as much of a time problem because kidneys can be maintained on a perfusion pump for about 72 hours. The Organ Procurement Center has three perfusion pumps.

With the use of cyclosporin A, which reduces the chance that the recipient's body will reject the donor organ, marked increases have occurred in the success rates of vital organ transplants. For kidney transplants after one year, it is now 97 percent; for liver transplants, 80 percent; and for heart transplants, 81 percent. To date, the longest that a person with a heart or liver transplant has survived is 15 years. Many kidney recipients have lived in excess of 25 years.

The Organ Procurement Center also coordinates the acquisition of eyes for the International Eye Bank in Baltimore and

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Closed-head Injury Problems Can Last

Some patients with closed-head injuries recover well in the hospital and, after discharge, have little apparent trouble readjusting to daily living.

But then, months or years after their accidents, something goes wrong. Deep-seated feelings of anxiety start cropping up in these patients. The cause of the anxiety may be a lingering psychologic or neurologic problem, says Paul A. McClelland, MD, director of psychiatric services for the MIEMSS Shock Trauma Center.

One such patient is a man who narrowly escaped certain death when, rounding a curve in his MG, he could not stop in time to keep his car from running underneath a tractor trailer that was sitting across the road. He ducked down just before impact and then blacked out. The last thing he remembered, was the horror of the thought of becoming decapitated.

Several months later, he started reliving the moment just before the crash in vividly detailed nightmares that awakened

him. When he saw a car crash on TV, or heard someone tell of a car accident, a flashback to his own accident occurred, leaving him nervous and jumpy.

As a result of fatigue from sleepless nights and excessive anxiety in any situation that triggered the memory of his accident, he became increasingly irritable and withdrawn.

Another patient, also a victim of a head injury, seemed to undergo an uneventful recovery. Months later, however, he started having spells, during which he would feel as if he had to vomit. This feeling, which came on suddenly and lasted only a few minutes, was accompanied by a sense of anxiety.

The spells he was experiencing were temporal lobe seizures. No one recognized that he was having seizures because feelings of nausea and anxiety are not the usual symptoms of a seizure and because they are general symptoms of numerous other maladies. Furthermore, the symptoms were not associated with the closed-head injury the patient had received because the accident occurred months beforehand. Treatment of this patient's seizures with anticonvulsants contributed to his relatively good outcome.

Other than knowing that anxiety is a major long-term problem of people who have sustained closed-head injuries, and the reasons for the anxiety, "we don't really know much about these patients," says Dr. McClelland, who is also director of consultation-liaison psychiatry at the University of Maryland Hospital.

In the case of patients who develop seizures, for example, "we don't know how prevalent the problem is, nor how many of the patients who do develop seizures end up with psychiatric disturbances," says Dr. McClelland. "Neither are we sure which come first — the seizures or the psychiatric disorder," he adds.

To find out the answers to these and other questions, MIEMSS is conducting a retrospective study on closed-head injury patients who have been treated at the Shock Trauma Center. The data are being collected from medical records and interviews with the former patients.

The findings of this study will be verified subsequently in a prospective study designed to follow the progress of new patients treated for closed-head injuries at the Shock Trauma Center.

Another question that needs to be answered by research, says Dr. McClelland, is why the severity of closed-head injuries does not always determine the severity of

the psychologic and neurologic problems that patients experience, nor the degree of recovery from those problems.

Some patients with mild closed-head injuries develop severe psychologic handicaps, while some patients with severe closed-head injuries remain free of such problems, he notes.

"If we can find out why some patients do relatively well, we might gain some insight into how to help the patients who develop long-term problems," he says.

Dr. McClelland has been working with closed-head injury patients almost exclusively for the last five years. Helping him in his research is Lynn Rutkowski, PhD. In addition, several other MIEMSS workers have focused major efforts on head trauma patients. They include Robert Thatcher, PhD; the Trauma Center's psycho-social services staff, particularly Bernice Wolfson; Marty Stevens, RN; the staff of the Center for Living, headed by Elaine Rifkin; and Margo Caulfield, a planner at MIEMSS.

— Dick Grauel

Donated Organs: Gifts of Life

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skin and bones for the respective tissue banks at University of Maryland Hospital. In 1983, for example, the center obtained 106 corneas for the Eye Bank. However, the personnel at those three banks take care of transporting the acquired anatomical parts to the recipients.

A look at the center's stats for its first year of operation shows high levels of activity and efficiency in procuring organs. The total number of kidneys, hearts, and livers obtained last year was 78. Of that number, 33 were used in Maryland and 45 were sent out of state. Five of the organs (all kidneys) sent outside of Maryland were discarded. However, donated organs that could not be used for transplantation, or for which there was no tissue-matched recipient, are not really discarded. These organs are used, instead, in research.

But the success of the Organ Procurement Center cannot be appreciated fully by examining its operational statistics. Its success is best expressed in human terms — in the happiness and gratitude of the organ recipients and of their families and their hopes that the grief of the donors' families might be eased by knowing that donated organs are truly "gifts of life."

— Dick Grauel

ACEP Conference Set

Maryland Chapter American College of Emergency Physicians — Spring Symposium, June 10–12, Annapolis Hilton Inn. Contact Dr. Robert F. Larkin, Maryland ACEP, 8401 Corporate Drive, Suite 620, Landover, MD 20785.

Region IV

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Michael Groves, RN, both of MIEMSS, for conducting the workshop on the roles and responsibilities of the admitting area, including information on the Med-Evac system. Following the classroom session and lecture, the Maryland State Police Med-Evac helicopter landed on-site for a familiarization program and demonstration. Sgt. Ralph Smith and Cpl. Gilbert Grey were the duty crew for the Cecil County program and Sgt. Gary Shields and Cpl. Michael Ptaszynski were the crew for the program in Chestertown. Our thanks to these individuals. Based on the success of these two programs, similar workshops and demonstrations are being planned for late spring with Sgt. Lee Fitzgerald of the Maryland State Police Aviation Division in Salisbury.

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Legislature Considers Many EMS Bills

(Continued from page 4)

grants to programs. A specific portion of the fund would be set aside for replacement of the communications system, as that system is becoming worn and obsolete.

MIEMSS sponsored legislation to regulate the helicopter transport of critically ill or injured patients in Maryland. The regulations would require that SYSCOM be notified when interhospital transports are made by nonsystem helicopters. In addition, the regulations would require that SYSCOM coordinate all helicopters responding to or evacuating patients from a mass casualty incident in Maryland.

Senate Bill 738 proposes that the Department of Mental Health and Hygiene (DHMH) license freestanding health clinics. The department would establish regulations pertaining to services that may be offered in a freestanding health clinic. MIEMSS testified in support of the concept of licensing these facilities, particularly as it relates to the public's perception of the nature of emergency medical assistance provided in these facilities. Due to the complexity of the issue, this pro-

posal is likely to receive additional review during summer study.

The attempt to reinstate mandatory motorcycle helmet usage in Maryland failed again this year. According to Kevin Anderson, EHS intern who has been monitoring all field program legislation, the clear statistical information that supports reenactment of the bill was not sufficient to pass the committees. This proposal will no doubt be reintroduced in the 1985 General Assembly, and only a grassroots lobbying effort of EMS providers and others will enable this bill to pass next year.

Several bills were introduced which could impact on the clinical operations of the trauma system. The concept of the living will was again addressed this session; however, the bill was not passed by the House. It is unlikely that any bills on this issue will pass in the near future.

Much of the clinically related legislation concerns reimbursement for hospital outpatient services. There is a strong legislative move to limit or exclude hospital outpatient services from medical assistance reimbursement. In addition, DHMH

has proposed restructuring hospital outpatient clinic reimbursement.

Another major area of legislative interest is allowing health professionals such as nurse anesthetists to be eligible for reimbursement. It is felt that this would help contain health costs.

Various bills were introduced this session that were relevant to rehabilitation of trauma patients. Two bills introduced by Senator Riley call for the state definition of developmental disabilities to include head injuries at any age (SB 475) and a plan of treatment and services for head-injured patients (SB 639).

Delegate La Motte also introduced two bills relating to rehabilitation. HB 487 would require DHMH to establish and maintain a disability registry for victims of spinal cord injury, head injury, amputation, and stroke. HB 488 would mandate rehabilitation coverage by all nonprofit health insurers providing coverage in Maryland. The introduction of these bills is an important sign that the Maryland General Assembly is now addressing the issue of rehabilitation.

— Dennis Evans and Margo Caulfield