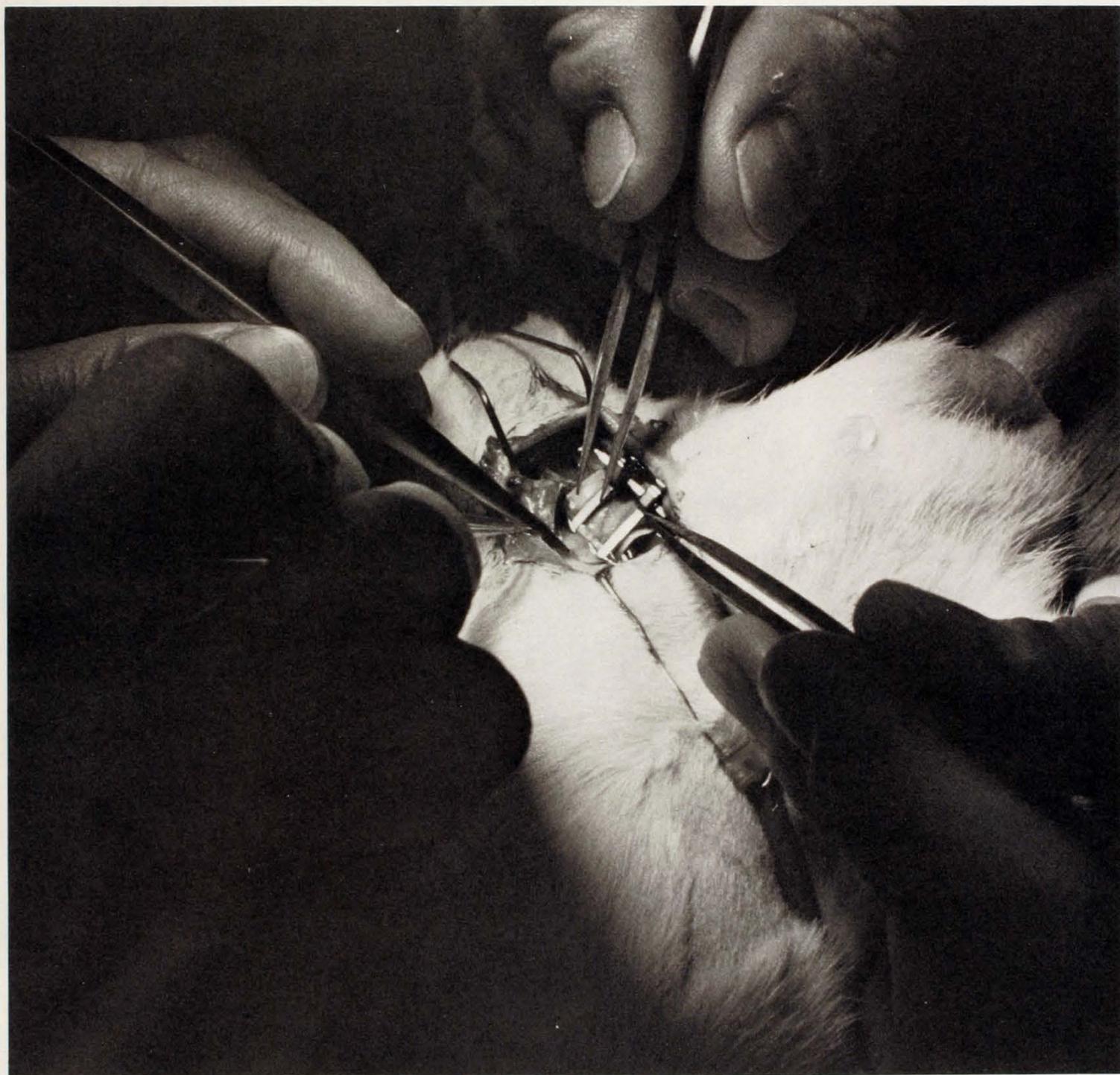


*Maryland*  
**EMIS**  
*NEWS*



MARYLAND INSTITUTE FOR EMERGENCY MEDICAL SERVICES VOL. 5 · NO. 2 · MAY 1978





Cover photo by Dick Register: In the microsurgical laboratory of the Raymond M. Curtis Hand Center, jeweler's forceps and special microvascular instruments are used in a delicate operation on a laboratory rat. The femoral artery (less than 1 mm. in diameter) and femoral vein will be sutured.

## Hospitals Offer OB, Perinatal Consultations

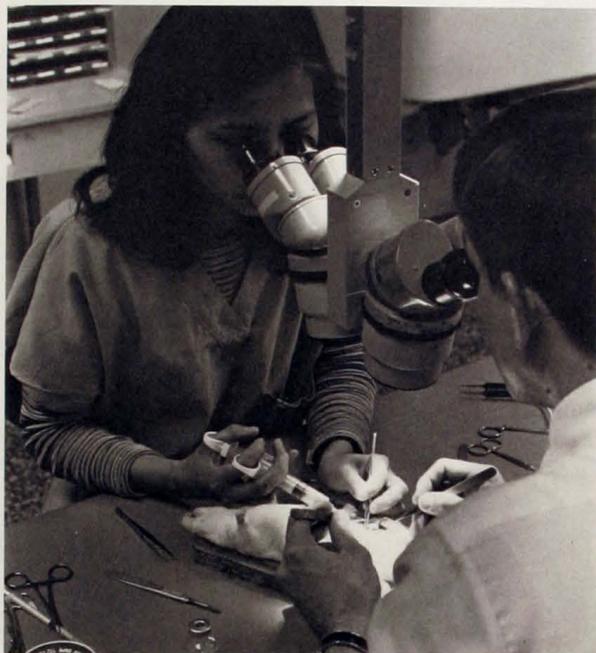
The Maryland Institute for Emergency Medical Services has added another service for physicians to the EMS system. Through the Obstetrical Divisions of the Departments of Gynecology and Obstetrics at the University of Maryland Medical School and the Johns Hopkins University School of Medicine, full-time consultative services for high-risk obstetrical patients will be available.

Consultation may be obtained 24 hours a day, seven days a week by calling the EMRC number, 578-8400 from Baltimore and 1-578-8400 from outside the Baltimore metropolitan area. Physicians will be connected directly to the unit on call for that day, or they may request to speak to either Division.

The joint obstetrical and neonatal service will provide consultation especially for medical and surgical perinatal complications including hypertension, diabetes, nephritis; premature labor; fetal distress; fetal growth retardation; isoimmunization; suspected teratogenicity from infection, irradiation, or drugs; possible genetic abnormalities; and fetal anomalies including neural tube defects and hydramnios.

Heading up the program from the University of Maryland are Juan Granados, M.D., Chief of Obstetrics, and Ronald L. Cutberlet, M.D., Chief of Neonatology, and from Johns Hopkins University, John W. C. Johnson, M.D., Chief of Obstetrics, and Michael Simmons, M.D., Chief of Neonatology.

Interested hospitals also may request seminars on obstetrical and perinatal problems, presented by a team of obstetricians, neonatologists, and nurses.



In the Hand Center's microsurgical lab, Mrs. Chouer Chen and Dr. Larry G. Leonard perfect microvascular techniques.

Photo: Dick Register

## Hand Center Emphasizes Total Care

Two years ago Jim Mims, a food-store-chain employee from D.C., had his index and middle fingers amputated by the rotary blade of a meat grinder. A fellow employee retrieved the two fingers and put them in a plastic bag. At an area hospital, the fingers were then placed in a styrofoam box containing ice in plastic bags and transferred with Mr. Mims to the Raymond M. Curtis Hand Center at The Union Memorial Hospital.

After more than 14 hours of microsurgery for the finger-replant operation, a team of four hand surgeons and nurses had sewn together arteries, veins, bones, muscle tendons, and nerves. Today Mr. Mims is being trained for an office job with the same company. He can use his fingers and open and close his hands, although he lacks some full extension and still has some intolerance to cold.

(Continued on page 5)

## Conference to Study Airport Catastrophes

On May 12 a passenger plane will collide with a fuel tank truck on a runway at Baltimore-Washington International Airport. As a result of the collision, approximately 180 victims with burns and multiple trauma will require emergency medical management. Approximately 75 percent of those victims could survive if they receive proper treatment within a certain time.

The simulation of the above scenario will provide participants in "Emergency Management at an Airport Catastrophe" an opportunity to explore what might be done to assure that those victims will survive. The program, sponsored

by the Maryland Institute for Emergency Medical Services and the Baltimore-Washington International Airport, will be held at BWI Airport on May 12 and 13.

During the staging of the mass casualty exercise, on-site medical management, triage, and rapid evacuation of the victims to definitive care centers will be evaluated.

The rescue operation will involve both Maryland State Police and Army Med-Evac helicopters as well as many ambulance companies from the surrounding areas.

Discussions will take place on how a computer simulation, using the same scenario as the Field Exercise, could provide alternative ways

of using medical supplies, personnel, and emergency vehicles to improve the survival rate of the burn and multiple trauma victims.

In addition, there will be a demonstration of satellite transmissions to provide physician consultation for on-site medical management thousands of miles away. The demonstration will be performed in cooperation with NASA's Goddard Space Flight Center, Communications Satellite Laboratories (COMSAT), and the Office of Telecommunications of the Maryland Center for Public Broadcasting.

Slow video scans of several burn victims, along with their vital signs, will be transmitted by the ATS-6 satellite, hovering 22,000 miles above Christmas Island in the Pacific. Physicians at Chicago's O'Hare Airport and Boston's Logan International Airport will assess these victims and offer suggestions regarding the feasibility of using telecommunications technology for remote patient assessment.

Full-motion color video transmitted by the CTS satellite will be evaluated by physicians at Brooke Army Medical Center in San Antonio, Texas. A group of physicians at Veteran's Administrative Hospital in Albuquerque, New Mexico, will observe the transmissions but will not offer medical assessments.

The results of the satellite transmissions will also be compared with assessments made by a group of physicians physically present at the casualty site and with assessments made through two-way audio communication.



Photo: Ed Garber

## Dedication Ceremonies Held For Communications System

Dedication ceremonies held March 29 officially announced the completion of Maryland's EMS Communications System (EMSCS). The first statewide UHF system in the nation, the Maryland EMSCS provides radio-telemetry communication between emergency medical teams in the field and consulting physicians at participating hospitals. The system also links ambulances, Med-Evac helicopters, central alarms, and hospitals in any area of Maryland to any other area.

R Adams Cowley, M.D., Director of MIEMS; John D. Stafford, M.D., Director of EMS Systems Programs; and Richard Neat, Chief of Communications, spoke at the dedication ceremonies. Following their talks, there were demonstrations of the EMSCS. (Photo) A CRT team from Montgomery County Medic 1 simulated an emergency situation in which ECG data are transmitted to a hospital communications console.

## 'Flying Spot' X-ray Scanner Evaluated

America's highways have often been compared to battlefields. In peacetime we are still carrying on armed warfare on the roads, and the casualties of war and peace are very similar.

At the Adult Trauma Center of the Maryland Institute for Emergency Medical Services (MIEMS) the patients closely resemble battlefield casualties. The severe, multiply-injured victim is treated at the MIEMS in a fashion which resembles the M.A.S.H. unit of wartime—treatment along with diagnosis, as rapidly as possible.

MIEMS even has its own former MASH-er, Robert Ayella, M.D., who heads the trauma radiology division. Frequently sought for his advice on medical/military projects, Dr. Ayella was recently approached by the U.S. Army to consult on a new piece of X-ray equipment. The American Science and Engineering "Medical Microdose X-ray Scanner," colloquially known as the "flying spot," was recently installed in the MIEMS admitting area.

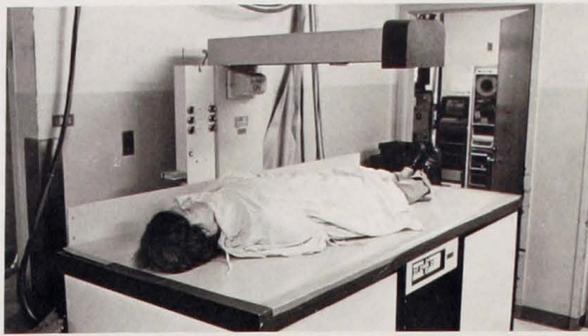
The "flying spot" is a computerized whole body X-ray scanner that produces a "flat" picture of the body (rather than an axial tomograph such as the CAT scanner produces). This flat picture can provide a physician with a quick review of injured areas which will need further X-rays. Without the scanner, the physician must rely on multiple X-rays to arrive at the same conclusion, taking more time and exposing the patient to more radiation.

But that's not all. The scanner derives its name from the way it takes an X-ray. The machine part which projects the roentgen ray resembles a pencil, with the ray actually being emitted only from the point. This "pencil" moves left and right within a flat casing, while the casing moves from the patient's head to toes. This is where the computer gets to work. The computer takes the images being provided during the "scan," and provides an immediate total "flat" image on a cathode ray tube (CRT) monitor. Voilà! Instant flat whole body X-ray.



Dr. Ayella makes adjustments on the data-processing system that stores X-ray images.

The advantages of the "flying spot" are multiple. In addition to providing a rapid, whole-body flat picture, the scanner needs no film or chemicals, since it produces a computerized CRT image. In the field, the logistics of carrying film and chemicals along with finding appropriate storage for them presents a constant problem. If a permanent copy of the X-ray is desired, the "flying spot" can pro-



Photos: Ed Gamber

A radiographic scan of the entire body can be made within seconds.

duce a "Polaroid-type" hard-copy picture, but this is not necessary for the physician to read the X-ray.

Radiation exposure is a problem both in the field and the hospital, presenting a hazard to both patient and medical staff. The "flying spot" emits a radiation dose roughly equal to one-fortieth of a conventional chest X-ray, and virtually eliminates the need for lead shielding.

Finally, in addition to providing a whole body picture, the scanner has the capability for zooming-

in and magnification.

A descendant of the airport baggage scanner, the Medical Microdose X-ray Scanner is still some five years away from field use.

Dr. Ayella will be assisting the Army in refining the scanner, especially in determining the smallest possible power source producing a good quality picture. While the scanner is in use, MIEMS will continue to follow its standard-X-ray procedures for the purpose of comparing the two methods.

—Marianna Herschel

## Nurses Research Nutrition of Patients

The staff nurses on the MIEMS Adult Trauma Center's Intensive Care Unit use a rather unusual instrument that isn't specifically related to their care of trauma patients, but rather to the fact that these nurses are involved in a nursing research project.

The instrument is a skin-fold caliper, a device to measure body fat, and it is used for a project to describe the nutritional status of trauma patients.

As in other nursing research projects at MIEMS, staff nurses identified an area of concern, and with the nurse researcher, developed the study. Dorothy Gordon, D.N.Sc., MIEMS Nurse Researcher, emphasized that the ideas are generated by the nurses on the floor who are involved in patient care, and that data collection depends on their involvement. Dr. Gordon lends her expertise in designing and carrying out the project. She is the Primary Investigator.

Dr. Gordon stresses that she is willing to consult with any hospital nursing personnel interested in developing nursing research studies. As a part of MIEMS educational services, she will visit hospitals in the state either to share the experiences of MIEMS nurses, or to work with nurses to set up their own clinical studies.

Marge Goolsby, R.N., Primary Nurse on the ICU, is the Project Director of the Clinical Nutrition study at MIEMS. She explains that trauma patients have lost tissue through the damage their injuries caused. They are also very vulnerable to infections. Therefore, their bodies must repair damage and fight off infection while maintaining the tissue they have.

However, they initially will usually go into negative nitrogen balance which indicates they are in a catabolic state—that their bodies are actually breaking down rather than rebuilding. The study

monitors how long it takes these patients to reach positive nitrogen balance, which indicates repair of tissue.

Dr. Gordon points out that although it is known that nutrition is important to the trauma patient, nursing studies which give an overall description of the nutritional status of trauma victims have not been reported. This study will help provide that picture. It can also be used as a basis for more complicated research.

The nurses are studying ICU trauma patients who are receiving tube feedings or hyperalimentation for 15 days. They must be able to be weighed and have 24-hour urine collected. Status is assessed through anthropometric and biologic measures. Demographic data, clinical events, weight, and muscle mass changes are recorded. Other factors which appear to influence nutritional status are described.

Anthropometric descriptions included an estimate of lean body mass determined through a formula which includes the measurement of fat in the upper arm with the caliper and the circumference of the arm.

Because the study includes only patients being fed by tubes directly into their stomachs or hyperalimentation which puts nu-

## CPR in Helicopters

To the Editor:

The Maryland State Police have experienced a problem with some of the fire departments and hospitals within the state concerning Med-Evac helicopter transport of patients who require CPR performed on them. Apparently, several people have the misconception that our personnel cannot perform CPR on patients in the helicopter.

This information is incorrect. As a matter of fact, recently a test procedure was accomplished with some staff personnel from MIEMS on the effectiveness of CPR performed on patients in transit in the helicopter versus a land ambulance. The test results indicated that the CPR performed on a patient in the helicopter was as effective as that done on a patient in a land ambulance during transport.

We hope that through the *Maryland EMS News* this information will be brought to the attention of the various organizations involved with the System in order to correct this misconception.

Gary E. Moore, Captain  
Commanding, Aviation Division  
Maryland State Police

trients directly into the bloodstream, calorie, fat, protein, and carbohydrate intake can be exactly determined. Lab studies of the 24-hour urine output measure metabolic products. By comparing the intake and the waste, the nitrogen balance can be determined.

Patients are weighed three times during the 15 days they are



Photo: Dick Regeater

Marge Goolsby, R.N., demonstrates the use of the skin-fold caliper on Karen Sole, R.N.

studied; the anthropometric measures are taken at the beginning and the end of the period; and the nitrogen balance is calculated daily with the assistance of Fran Lang, MIEMS dietician. Dr. Gordon and Ms. Goolsby plan to collect data on 50 patients for this initial study.

Ms. Goolsby is enthusiastic about the interdisciplinary cooperation going into the study, with nurses, physicians, a dietician, and a pharmacologist contributing. Also, she says, it is a learning experience for the nurses. "They see there's no reason nurses can't conduct research, too."

Anyone interested in developing a nursing study and in receiving Dr. Gordon's assistance, can call Dr. Gordon at 528-6846.

—Dottie McCaleb

### Maryland EMS News

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# How Does EMS Respond to Deaf Patients?

THIS IS THE MD STATE POLICE GA [Go ahead]

HELLO I WOULD LIKE TO KNOW HOW I CAN GET TO THE EMERGENCY ROOM AT JOHNS HOPKINS FOR CHILDREN GA

DO YOU WANT TO GO IN PERSON OR PHONE GA

GO IN PERSON GA

WHAT IS YOUR LOCATION NOW PLS GA . . .

HOLD ON WILL CHECK OUT ROUTE . . .

OK I THINK WE CAN FIND IT THANK YOU VERY MUCH

Calls for emergency assistance similar to this one are frequently received at the communications center of the Maryland State Police Pikesville headquarters. The call quoted above is not unusual, even when one realizes that the caller is a deaf person and that the conversation was conducted via a telephone-teletypewriter (TTY). The State Police have used the TTY since 1972 to handle emergency assistance calls from the deaf. At that time, the Baltimore-D.C. corridor had the second largest deaf population, surpassed only by Los Angeles which, logically enough, had the only other TTY for emergency calls.

The number of TTYS used by the deaf in Maryland is growing. According to the Reverend Louis Foxwell, Jr., who is Director of Deaf Referral Services, Inc., and minister at Christ United Methodist Church for the Deaf in Baltimore, there are probably 600. (This is a significantly larger number than those utilized in previous years but a small percentage when one realizes that the total population of deaf persons in Maryland is estimated to be 35,000, with about 10,000 residing in the Baltimore area.)

As the number of TTYS used by the deaf community increases, the number installed in central alarms, 911 dispatch centers, and police communications centers in Maryland is also increasing. Frederick, Washington, Prince George's, Charles, and Montgomery counties—areas with large deaf populations—have TTYS to handle emergency assistance calls. The number of calls handled range from four or five a month to 50 or 60.

Most TTYS at central alarms have a special phone number that is circulated among the deaf community. (If there is no special phone number, a series of tones alerts the central alarm that the caller is using a TTY.) When the phone rings in the central alarm, the receiver is placed in the "relay" unit, a connecting acoustic coupler. The deaf person then places the receiver in the "relay" unit and types out the message. (Typewriter signals are converted to tones and transmitted over the wires.) At the central alarm, the TTY keys type out the message being transmitted. The communications dispatcher can then type out an answer in response; this answer is relayed to the deaf person through the same procedure.

TTYS provide a means for deaf persons to access Maryland's EMS system. But in emergency situations in the "field" and in hospi-

tals, the communications gap between most deaf and hearing persons remains. To help bridge this gap, several groups of emergency medical field personnel and hospital personnel have offered deaf awareness courses that combine methods of communicating with the deaf and an introduction to the problems facing deaf persons. Two of these groups that offered such courses were the Baltimore County Fire Department and The Union Memorial Hospital.

Last year 84 cardiac rescue technicians (CRTs) participated in a "no-frills," four-hour crash course in communicating with the deaf. According to Captain Ralph Maxwell of the Department's EMS Division, the course was "basic, deliberate, and to the point."

His main objective was to provide a group of CRTs with communication skills to assess a deaf patient. When ambulance personnel encounter a deaf patient, they frequently realize what is meant by the phrase "deafness—the invisible handicap." For example, if the patient does not answer your questions, is he brain-injured or deaf; if he mumbles unintelligibly and moves his hands excitedly, is he going into diabetic coma or is he deaf.

To provide a "sign language of assessment," Captain Maxwell and interested CRTs compiled a list of phrases that they felt would be most helpful in making assessments. Phrases like: Do you hurt? Where? How long have you hurt? Do you want to go to the hospital? What's your name? Stay calm.

This list of phrases, along with finger-spelling, was taught to the CRTs by the Reverend Foxwell who had been contacted to teach the course. (In sign language, each gesture denotes a concept; in finger-spelling, each gesture denotes a letter of the alphabet.) Reverend Foxwell also emphasized the use of facial and body gestures as a means of communication and talked about attitudes and misunderstandings regarding the deaf.

Captain Maxwell emphasizes that it was a "simple, easy, economical project to implement," and is amazed when he receives frequent calls about the course—some from as far away as Canada and Florida. He realizes the limitations of the course but points out that it helps to lessen the stress and fear resulting from communication problems that are usually experienced by both the deaf patient and the ambulance attendant in emergency situations. To illustrate, he

cites the example of CRT Carroll Evans who, a few days after he completed the course, encountered a deaf patient. When Mr. Evans began to use his training in basic signs, the patient began to visibly relax, and realizing the limitations of Mr. Evans' training, began to respond to his questions on his level.

The same type of course—but tailored to the needs of RNs and LPNs in the Critical Care and Intensive Care Units—was offered at The Union Memorial Hospital. Nurses had requested the course since they had had several deaf patients and had difficulty communicating with them. Through Gallaudet College, the Reverend Donald Burggraf was contacted to teach the course, which was broken into five one-hour Wednesday sessions. Through lectures, textbook readings, and "lots of practice in constructing sentences," the nurses learned finger-spelling and about 50-55 signs for medically-related terms and such words as water, bedpan, lonesome, confused. They also discussed their own feelings about deaf persons and special problems they encountered in dealing with deaf patients.

To help ambulance and hospital personnel working with deaf patients, the Reverend Foxwell, who taught the Baltimore County CRTs, offers additional suggestions.

1. Keep communication simple and concise. If you are communicating verbally with a patient who can lipread, face the patient and speak distinctly, remembering that even the most skilled lipreader can usually distinguish only about 30 percent of what is being said. If you are communicating in writing or finger-spelling, remember that for most deaf people, English is a "foreign" language.

2. Non-verbal communication—mime, gestures, facial expressions, drawing, writing, demonstrating—are extremely effective means of communication. For hospitals, flash cards with symbols and words (for example, "glass") could be made available.

3. Use "interpreters for the deaf" in situations requiring more than basic communication skills (such as taking a medical history or explaining an operation). (Names of interpreters can be obtained from a deaf referral center.)

4. Do not shout if a person is wearing a hearing aid. The hearing aid acts as an amplifier; if words are perceived as distortion, the hearing aid only turns up the volume of the distortion. For many profoundly deaf people, hearing aids provide little or no help, except for awareness of loud noises.

Further information regarding services available for persons dealing with the deaf can be obtained from Deaf Referral Services, Inc., 3300 Elmora Ave., Baltimore, Md. 21213 (276-3323). In addition, a poster containing many basic signs helpful in working with the deaf can be obtained free from the Baltimore City Health Department (contact Earl Watson, Health Education and Information Office, Baltimore City Health Dept., 111 N. Calvert St., Balto., Md. 21202).

—Beverly Sopp





Photo: Bev Johnson

### EMS Council in Region I Wins Award for Service

The Cumberland Broadcasting Company recently presented an "Outstanding Achievement Award" for community service to the Region I EMS Council. Fred W. Miltenberger, M.D., currently vice-president and former president of the EMS Council, received the award. The

EMS Council was one of three non-profit organizations to be honored. The award was based on the achievements of Region I's EMS Program and Council. Shown in the photo are Dr. Miltenberger and Dave Ramsey, Region I Coordinator.

## MIEMS Announces New Staff Appointments

New appointments in MIEMS clinical and field programs include the following.

**Ernest A. Austin, M.D., Chief of Surgery and Traumatology.** Dr. Austin returns to MIEMS Adult Trauma Center after being Director of Emergency Services at University of Md. Hospital. Prior to that, he was Chief of Surgery and Traumatology at the Adult Trauma Center from 1974 to 1976. He has also held appointments as chief of surgery at Baltimore's Provident Hospital, North Carolina's Reynolds Memorial Hospital, and New York's Fordham Hospital. Dr. Austin is assistant professor of surgery at the University of Md. School of Medicine.

**Cheryl Bowen, R.N., Nurse Coordinator.** Formerly a nurse clinician in the Intensive Care Nursery at the University of Md. Hospital for six years, Ms. Bowen was also a lecturer for the EMS workshop on neonatal care. At MIEMS, she will be conducting workshops on neonatal care.

**Beverly Grossman, R.N., Nurse Coordinator.** Ms. Grossman is currently assessing the needs of community health nurses in Maryland's five EMS regions in preparation for workshops for community health nurses next fall. In addition to teaching at the Union Memorial Hospital School of Nursing for three years, she was a staff nurse in the pediatrics department of University of Md. Hospital and head nurse at Camp Glyndon for Diabetic Children.

**Dennis Jones, R.N., Nurse Coordinator.** Mr. Jones will be teaching a first-responder's course for industrial and school nurses to provide improved care for the acutely ill or injured prior to the arrival of EMTs. Mr. Jones previously worked in the Intermediate Care Unit of MIEMS Adult Trauma Center and in Franklin Square Hospital's Intensive Care Unit. He is also an EMT and CRT with the Middle River Ambulance Rescue Squad.

**Ron Schaefer, Paramedical Training Officer.** Prior to coming to MIEMS, Mr. Schaefer, a CRT instructor, did advanced life-support training for the Baltimore City Fire Department.

**Marie Warner, Chief, Testing and Certification.** Ms. Warner is responsible for the testing of EMTs and CRTs and the certification of EMTs and first-responders completing the Crash Injury Management course. Prior to her appointment, she was Associate Coordinator for Region IV (Eastern Shore) and an administrator at Washington College in Chestertown, Maryland.

**Bill Neal, Examinations Coordinator.** Mr. Neal will be responsible for EMT examinations. He

holds EMT certifications in Arizona and Maryland, and was an EMT instructor in Arizona.

**Cink Weitzel, Patient Disposition Coordinator and Health Educator.** Ms. Weitzel will be MIEMS Adult Trauma Center's liaison with referring physicians and hospitals regarding patient care and follow-up. She also teaches a course in the Health Education Department at Towson State University and has previously worked in MIEMS Systems Communications Center (SYSCOM).

## MIEMS Offers Comprehensive CNS Care

Severe head injuries—a major cause of death among accident victims. There is an air of mystery surrounding head injuries that evokes an element of fear, even in physicians.

**Dermot P. Byrnes, M.D., F.R.C.S.I., MIEMS Staff Neurosurgeon,** sees a major thrust of his job to help others overcome that fear, to educate non-neurosurgeons concerning what can be done about central nervous system (CNS) trauma, and to "open the specialty."

MIEMS provides total CNS services 24 hours a day—neurology and neurosurgery for head and spinal cord injuries, as well as non-traumatic neurological problems, such as stroke and neurological aspects of other diseases. About half the patients admitted to MIEMS have some CNS injury, often in conjunction with other injuries.

Last year the Institute admitted about 60 severe spinal cord injuries into its special spinal cord referral program. The program offers comprehensive care through assembled expertise and resources to any spinal cord injured patient from Maryland and surrounding states.

Of the approximately 1200 admissions to the Institute last year, about one-quarter (240) had life-threatening head injuries. About 73 percent of these were the result of traffic accidents; 12 percent were due to gunshot wounds; and 15 percent were the result of other causes including plane crashes, industrial accidents, falls, assaults,

and falling objects. Three-quarters of these victims are men, mostly between 20 and 29 years old. The women are mostly between 10 and 19 years old.

Comparisons are difficult to make because the MIEMS patient population is unique, admitting only the most critically injured patients, and because "life-threatening" is a subjective judgment. But only 10 percent of victims admitted to MIEMS with life-threatening head injuries who live more than 24 hours succumb.

Traditionally, neurosurgical management meant primarily operative techniques. But the management of severe closed head injury without a surgical lesion still presents a challenge to the neurosurgeon and traumatologist. The focus is now shifting to cerebral edema and brain stem contusion.

The latest phase in the care of the head injured began in the late 1950s and early 1960s with the use of steroids, the measurement of intracranial pressure, and the use of hyperventilation, Dr. Byrnes said. Current techniques of ventilatory control, intracranial pressure measurement, use of mannitol to decrease pressure, evoked electrical potentials, and computed tomographic (CAT) scans make the management of head trauma complex, but more effective.

All CNS patients at MIEMS are managed according to a standardized protocol. Their treatment depends on the type of injury. For some patients with cervical spine injuries, management includes the halo-vest apparatus. This device is

a discussion of specialist roles in trauma care and a series of specialty workshops including Medicine, Dentistry, Nursing, Social Work and Pharmacy. The afternoon program includes six workshops, each presented twice: Pharmacology of Drugs Used in Trauma; Health Professional/Legal Aspects of Trauma; Alcohol and Drug Abuse—Prevalence and Effect in the Trauma Victim; Psychological Factors of Patient-Family Intervention; Head and Spinal Cord Injuries; and Maxillo-Facial Injuries.

On Friday there will be two panel discussions. One will consider rehabilitation from the patient's viewpoint, including hospital, nursing, and extended home-care aspects. The second panel will discuss patient/family rehabilitation services, the pastoral role, hospitalization costs, and legal aspects.

Ten hours of AMA Category 1 continuing education credits will be available for physicians. Participants from dentistry, nursing, pharmacy, and social work will receive 1.0 continuing education unit.

For more information and registration forms, contact Trauma Conference, c/o Laurence Katz, 500 W. Baltimore Street, Baltimore, MD 21201. The registration fee is \$60 and must be received by May 26. The conference is open to any one who is interested.

used for patients with unstable cervical injuries which will heal with stabilization. It immobilizes the head and neck to allow the spine to heal, precluding the necessity of fusing bones in some cases. MIEMS has been using the device routinely for about two years.

Dr. Byrnes cooperates closely with the Division of Neurosurgery, University of Maryland School of Medicine and Hospital, and its head, Thomas B. Ducker, M.D. In addition to Dr. Byrnes, two senior neurosurgery residents from the Division work in the Institute to provide constant neurosurgery coverage for MIEMS patients. Dr. Byrnes, who is Assistant Professor in the Division of Neurosurgery, has educational responsibilities for medical students, residents, and attending staff.

Dr. Ducker has input into MIEMS neurosurgery programs, especially the spinal cord referral program. He has developed a spinal index to determine the amount of function a patient has on admission and what percentage he recovers. Now in experimental stages, this index will provide a much needed objective evaluation of spinal cord patients.

MIEMS Orthopedic Surgeon Jaime Solano, M.D., and his colleagues, together with Charles C. Edwards, M.D. (head of Orthopedic Surgery, University of Maryland) and his staff, also cooperate closely with Dr. Byrnes. Many CNS injuries include bony damage as well as neurologic damage. While

(Continued on page 6)

# Hand Center Opens New Rehabilitation Section

(Continued from page 1)

Raymond M. Curtis, M.D., Director of the Hand Center, relates the story of Jim Mims because it is both a "success" story and not an unusual story for the Hand Center, where more than 1200 hand operations are performed a year by a team of hand surgeons. (The majority of these are reconstructive surgery, with approximately 25 percent "acute emergencies.") The need for a hand trauma center is underscored by 1975 statistics from the Maryland Division of Labor and Industry that indicate approximately 25,499 work-related injuries involving the hand and arm.



Dr. Raymond Curtis performs hand surgery.

The Hand Center at Union Memorial consists of an acute trauma unit, a microsurgical laboratory, and a new Rehabilitation Section that was made possible by a gift from Mr. and Mrs. Richard M. Heather and officially opened last January. A specialty referral center in Maryland's EMS echelons of care system, the Hand Center became operational in 1975 as the first hand center in the nation to be part of an EMS system. The Hand Center serves patients in Maryland and the surrounding states, but has also received referrals from the Middle East and Europe.

The Hand Center has a 75-80 percent successful replant rate. This success rate is greatly dependent on the type of care the patient and amputated part or partially severed part receive prior to arrival at the Hand Center. Dr. Curtis points out that if the amputated part is properly cooled, it can be replanted up to 12 hours later. This time span is decreased and becomes more critical if the part contains muscles. If circulation is not restored to the muscle within six hours, the chance of restoring the muscle function to

the patient is considerably lessened.

A hand operation may take 14-16 hours and involve as many as six microsurgions, working in teams of two for four-hour periods. Two teams often work simultaneously—one team working on the patient, the other on the amputated part. Arteries, muscles, bone, and nerves are sutured to restore circulation and facilitate normal functioning.

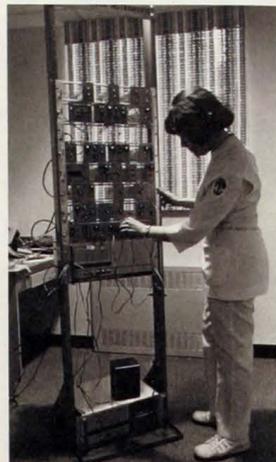
After extensive surgery, patients are generally monitored in the Intensive Care Unit. Particularly in cases of revascularizations, observation of body temperature can indicate the success of the operation. According to Dr. Curtis, "if the temperature of the amputated part stays close to that of the rest of the body, everything is OK. If a drop in temperature occurs, there is trouble with the replanted part."

Since hand microsurgery is generally not performed daily, a microsurgical laboratory is used by the surgeons to maintain and perfect techniques for the delicate operation. In the lab, microvascular surgery is performed on the femoral artery of a rat. This artery is less than 1 mm in diameter, needle and suturing thread are barely visible to the human eye (the suturing thread is 22 microns in diameter—thinner than a human hair). The surgeons work with special microvascular instruments to practice step-by-step procedures for various types of arterial anastomosis. (Perfecting anastomosis techniques is important, for without the hookup of blood vessels, a replanted part would not survive.) Dr. Curtis points out that "the idea that we could suture a vessel so small was previously inconceivable. What's amazing is that you can make the hands do anything the eye can see to do."

*Referring hospitals or physicians can contact the Raymond M. Curtis Hand Center at The Union Memorial Hospital through the Systems Communications Center (SYSCOM) on the toll-free number (800-492-0610).*

Dr. Curtis' interest in hand surgery goes back to 1944 when he worked as Assistant Chief of Hand Services in California with Sterling Bunnell, M.D., who had established nine Army Hand Centers during World War II. Dr. Curtis,

now Chief of the Division of Hand Surgery at The Union Memorial Hospital and Consultant to the Surgeon General of the Army in Hand Surgery, comments that the field of microsurgery and of hand replants is just developing.



C. Janice Maynard explains the multiple biofeedback system.

The newly opened Rehabilitation Section at the Hand Center is co-directed by C. Janice Maynard and Rodney Schlegel, who head Occupational Therapy and Physical Therapy at Union Memorial, respectively. They are assisted by a staff that includes several occupational and physical therapists, a full-time social worker, and a psychiatrist-consultant.

A primary objective of the Rehab Section is to help the patient regain hand and/or finger function and to be reintegrated into his family and work environment. Individual and group therapy sometimes extends over a few years, often interrupted by additional surgery.

Areas of the Rehab Section were designed according to an "open-space" concept. For example, the splint-making area is accessible to the workshop area. A patient being fitted with a splint can see other patients with similar injuries using their hands. According to Dr. Curtis, "one patient rehabilitates another."

Certain areas are closed in and windowless, however, to minimize visual and auditory distractions for patients receiving the sensory training necessary when a lacerated nerve has regenerated. Tuning forks are used to help evaluate whether the newly grown nerve can feel vibrations of different frequencies.

A distraction-free environment is also used when patients are instructed in biofeedback techniques. For example, working with a biofeedback machine, patients are taught to consciously raise the temperature in one or both hands (blood vessels in the fingers often constrict during cold weather causing the hands to become extremely cold). Lights blink on the biofeedback machine to indicate that the patient is raising his temperature. Similarly, electrical potentials produced by changes in muscle tension are amplified by electromyographic biofeedback so that the patient hears a series of "clicks"; this helps

the patient isolate his muscle action and control it, which is particularly useful when a surgeon wants to transfer one muscle to take the place of a paralyzed one. Biofeedback may also be used to teach a patient to relax muscles.

Physical therapists use many other methods, including hydrotherapy and various heating modalities, in treating patients.

In occupational therapy, patients are instructed in "activities of daily living." Self-aids are often used (for example, a large-handled fork for a patient who cannot fully bend his fingers to hold a normalized handle). Besides feeding, grooming, and dressing, recreational, work, and household tasks are reviewed to make each patient independent and to encourage maximum use of the injured hand and arm.

A therapeutic recreation room, light- and heavy-duty workshops, plus a pediatric room, round out the Rehab Section. Therapeutic recreation is adapted to the activity of the patient; for example, a pool stick handle could be adapted so that a patient could hold it by bending his recently replanted finger around it, thereby getting exercise as well as enjoying one of his customary recreational activities.

The light workshop is utilized for teaching such things as manual skills and dexterity; the heavy-duty workshop is used not only for relearning tasks but also to build up stamina (for example, standing tolerance before returning to a routine 40-hour work week).



A radiometer is used with biofeedback techniques to indicate the patient's hand temperature.

Tasks are selected according to the particular muscles, nerves, and joints that need retraining following injury, and with regard to such things as the patient's type of work and level of education.

## Treatment Procedure Clarified

*Procedures for caring for the amputated part or partial amputation . . . These procedures recommend that the wound, amputated part, or partial amputation should be "flushed with Ringer's lactate." In response to questions from personnel in the field, Dr. Curtis offers a clarification: normal saline solution may be used although Ringer's lactate solution is preferred.*

The Hand Center uses sophisticated techniques and machines, but what distinguishes it from any hospital doing hand replant operations is the total care and team concepts. Speaking of microsurgical operations, Dr. Curtis says: "It's a team effort. . . . A doctor cheers his teammate each time a successful stitch is made." Because of the atmosphere of support evident throughout the Hand Center, one can easily agree with the image of doctor cheering for doctor, of therapists cheering for patients, and of patients cheering for one another.

—Beverly Sopp



A battery-operated transcutaneous afferent nerve stimulator is basically a "pain inhibitor." Here physical therapist Fran Terry demonstrates how both pads are placed to minimize an ulnar nerve hyper-sensitivity problem.

# Moulage Expert Exercises Skill in Creating 'Victims'

Red ox-blood shoe polish, styrofoam, putty, Duco cement, coffee grinds, mortician's wax, rigatoni, toilet paper, vaseline, dirt . . . all tools of the trade to Lou Doering, who will head the moulaging teams at the Airport Mass Casualty Exercise on May 12.

Mr. Doering has moulaged more "victims" than he can remember, often preparing as many as 80 victims with lacerations, fractures, burns, etc., during a three-hour period. He insists that he does a "detailed" job on only three or four; but judging from some comments of medical and rescue teams,



Charcoal-smear, ragged toilet paper simulates charred flesh for Gerry Lupton's third-degree burn.



Mr. Doering puts finishing touches on the leg fracture of Esther Lupton. (A piece of styrofoam simulates bone jutting out.)

some of Mr. Doering's victims could probably rival TV's "Emergency" victims in appearance.

For example, there was the victim in a disaster exercise at Martin's Airport. "That guy wanted a ride on a helicopter to the Shock-Trauma Unit so bad. He kept telling me to add more make-up—to make him up so he could be taken to Shock Trauma. . . . Well, I did, but you know the rescue crew said 'He's done for' . . . and left him there as dead. He never did get that ride." Or there was the case of a "victim" in another exercise who

## CNS Care Offered

(Continued from page 4)

the nerve injury is more acute, often both must be surgically managed during the same operation.

As in other MIEMS clinical specialties, research is a continuous activity. Dr. Byrnes is currently involved in a study on diabetes insipidus in head-injured patients. There have also been recent studies with colleagues on cerebral autoregulation, and the use of steroids in head-injured patients.

Through such studies, the clinical success of MIEMS patients, and educational activities, Dr. Byrnes is showing what can be done for the head-injured patient, making the management of those patients a little less mysterious.

—Dottie McCaleb

almost had an I.V. inserted before someone convinced the hospital attendant to "look more closely."

Mr. Doering's interest in demonstrating moulaging (or "molding" injuries) goes back to about 1957 when he joined the Red Cross Institute to teach make-up to Red Cross instructors so they could "get their students closer to the blood—to the real thing." Since then he's developed his own style and is "constantly trying new things."

Part of his preference for "household" ingredients is based on his constant search for substances that will yield a durable



Mr. Doering smoothes make-up around the edges of Gerry's putty-created bullet hole.

finished product and be comfortable for the victim. A reality of life is that if you're heavy on the grease paint and your victims have to wait in the hot sun for a few hours before the disaster exercise and their subsequent "rescue," the grease will melt. Thus, Mr. Doering sometimes prefers a flour-and-water dough mixture to putty for molding an injury; a cocoa mixture or model-plane paint to commercial "vampire's blood."

The simulated wound not only has to look real, it has to last—at least until the end of the disaster exercise. Mr. Doering approaches that task with the imagination of a true artist.

—Beverly Sopp

## EMS-Related Legislative Bills Receive MIEMS Staff Support

Among the many EMS-related issues confronting the Maryland legislature this year were several bills which elicited direct involvement from MIEMS.

Senator Rosalie Abrams introduced two drunk-driving bills for which members of the MIEMS staff testified. SB 280 proposed lowering the limits for determining legal blood alcohol limits for driving while impaired/intoxicated to .08mg% and .10mg%, respectively. This was the eighth consecutive year that the bill was introduced. Carl Soderstrom, M.D., MIEMS attending physician, Carol Benner, director of the MIEMS clinical laboratories, and Beth Hall, MIEMS intensive care nurse, provided support testimony. The bill was approved by the Senate only to fail once more in the House Judiciary Committee. As a result, Maryland still has the highest legal blood alcohol limit for driving while intoxicated—.15mg%.

Senator Abrams' SB 318 proposed altering the penalty for "Homicide by Motor Vehicle While Intoxicated." The existing penalty had proved to be functionally unconvictable. The aim of SB 318 was



Photo: Dick Register

Mr. Doering usually starts with a putty and vaseline mixture to form the base of the wound. This is blended into the skin with liquid make-up. Various injuries are then formed and covered with dripping blood (either ox-blood shoe polish, a food-coloring or cocoa mixture, or model paint) and sprinkled with dirt. Here, rigatoni, spread over the stomach of Gary Hoppe and covered with "blood," becomes intestines spilling out.

## Patient Care Pharmacy Opens In MIEMS Adult Trauma Center

The Patient Care Pharmacy, the first trauma satellite pharmacy in the country, began service to MIEMS Adult Trauma Center in March. This new pharmacy operation resulted from the efforts of many people, including R. A. Cowley, M.D., MIEMS Director; V. de Paul Burkhart, M.S., Director of Pharmacy Services; and Debbie Naccarto, M.S., whose thesis work was instrumental in determining the type of pharmaceutical services needed for the adult trauma patient.

The Patient Care Pharmacy is directed by pharmacist Joseph Sokol, with the assistance of Evie Williams, R.Ph., and Karen Demsky, R.Ph. The satellite pharmacy is located within the Unit to save time in filling orders and in handling unexpected situations. In addition, cooperation of the nursing and clinical staff with the Pharmacy should increase the efficiency

of drug delivery.

Due to the complexity of drug regimens and interactions, it is necessary to treat the whole patient as much as possible. Since the trauma victim has almost every defense mechanism bypassed, infection is a constant threat and antibiotic therapy is a main concern. Narcotic analgesics, particularly morphine and merperidine, are required in almost every instance. Increased intracranial pressure, a common after-effect of severe trauma, is treated with steroids which are also administered as standard practice in the early treatment of septic shock. About 60 percent of all trauma cases require antacid therapy for the prevention of gastric ulcers which often result when the body is subject to extreme stress. Proper fluid and electrolyte balance must be achieved, and nutrition is maintained by oral alimentation and parenteral hyperalimentation solutions tailored for each patient's needs.

Another unique aspect of MIEMS trauma pharmacy program is the presence of a full-time clinical pharmacist. The position is filled by Thomas Majerus, Pharm.D., who works with Jack Applefeld, M.D., and Ellis Caplan, M.D., as a staff member of the Division of Critical Care Medicine. At present they are researching the pharmacokinetics of the aminoglycoside antibiotics and digoxin (a cardiotonic agent), relating blood levels with therapeutic effects, cures, and toxicities. The data have been used to develop and revise computer programs which provide doctors with proper dosage regimens. Because trauma patients do not follow any normal pharmacologic pattern, the main objective of Dr. Majerus is to monitor drug therapy, fluid and electrolyte balance, and nutritional status at constant intervals for each patient, and to trouble-shoot any problems that arise. As Assistant Professor of Clinical Pharmacy at the University of Maryland School of Pharmacy, he also provides one-to-one, on-the-job training for the pharmacists in the Trauma Center and the medical and Pharm.D. residents to help them develop the expertise to treat the adult trauma patient.

—Lynn Rutkowski

—Marianna Herschel

# MIEMS Assists Virgin Islands in EMS Training



Shaped like a drop of blood, the patch signifying the Virgin-Island EMT depicts a palm tree, tropical sun, lush green vegetation, and the star of life.

Marylanders traveling to the U.S. territory of the Virgin Islands may remark on the lush vegetation, palm trees, and Caribbean sun. What they may not notice, however, is the new emergency medical services system being developed. And what very few would know is that the Maryland EMS system played a significant role—sharing resources, experiences, and personnel—in helping the Islands to develop a functional EMS system.

In May 1976, Kirk Grybowski, EMS coordinator for the Islands, attended the Bicentennial Emergency Medical Services and Traumatology Conference in Baltimore. He was looking particularly at the Maryland EMS system and hoping to adapt ideas to establish a model system for the 100,000 inhabitants of St. Thomas, St. Croix, and St. John.

At that time there was no training for emergency medical technicians (EMTs) in the Virgin Islands. Ambulance drivers and attendants sometimes had only the minimal requirements of a driver's license. Cardiopulmonary resuscitation (CPR) was virtually unknown. Ambulances were dilapidated vehicles with broken windows, supplied with stretchers but no life-support equipment. However, there are now more than 100 Islanders (ranging from ambulance attendants with little formal education to Ph.D.'s) who have completed the 81-hour EMT course and are certified according to the guidelines set forth by the Department of Transportation (DOT) and the National Registry of EMTs. In addition, five new ambulances that are DOT-equipped and approved are now manned 24 hours a day by certified EMTs.

The initial training of the EMTs was done by a group of

Marylanders. At the request of Mr. Grybowski, Lou Jordan, paramedical training specialist at MIEMS, assembled a training cadre composed of himself as EMT instructor; a CPR instructor; and physicians and nurses.

As the training program progressed, potential EMT instructors were trained and did intern instructorships under Mr. Jordan in order to ensure that the Islands' EMT training program would be self-sufficient. Special emphasis was also placed on CPR, with many CPR courses given to both hospital and non-medical groups.

The EMT course taught in the Virgin Islands consisted of the traditional instruction in controlling bleeding, testing for vital signs, treating shock, etc.—with two "extras" required. Virgin Island EMTs are taught rappelling and water-rescue operations. Both are helpful in rescue work. Thousands of tourists as well as native Islanders participate in water sports or explore the rugged Island terrain where outcroppings of bare rock are common and elevations range from a few hundred to 2000 feet above sea level.

Training in sea rescues is also important because of the isolation of the Islands. The Star of Life II, the world's largest sea ambulance, is stationed at St. John and ferries patients from the smaller islands or patients who become injured or ill at sea to the large hospitals on St. Thomas. The 43-foot, unflight sea ambulance with a speed capability of 27 knots, is equipped for life-support operations and rescue in the often treacherous Caribbean waters. Equipped with rescue packs, a Stokes stretcher, other types of stretchers, and a flotation-type backboard, the Star of Life II is staffed by an Island physician, nurse, and trained EMTs.

Utilizing the resources of Star of Life II, EMTs were given special training to handle water-related emergencies.

Mr. Grybowski is also working to assure that Virgin Island EMTs will have the opportunity to be trained to the CRT level. Last summer two EMTs from the Islands took CRT training in Maryland through the cooperative efforts of MIEMS; John Stafford, M.D., Director of EMS Programs for MIEMS; the Baltimore City and County Fire Departments; and Sinai Hospital. Although they do not function as full CRTs in the Virgin Islands, they are utilized in

hospitals to provide training in taking ECGs and to assist emergency department physicians.

Plans are also underway for a cardiac life-support program for physicians, along with CPR-instructor and trauma-nursing programs.

Discussing the Virgin Island EMS program for which he continues to act as consultant, Mr. Jordan continually interjects comments of praise for the EMTs and for cooperating agencies that provided equipment, training sites, and funding. And he remarks that "if anyone wants to see what EMS is all about, they should go to the Virgin Islands to see how with no equipment or experience they have developed a spirit, pride, and ability that far exceeds the initial dreams of anyone."

## Nurses Attend Workshop; Learn To Initiate, Cope with Change

Indicate whether you agree totally (TA) or partly (PA); are undecided (U); or disagree totally (TD) or partly (PD).

*A nurse who projects the image of an inside change agent in a health institution will lose her job within a year or two.*

TA PA U TD PD

*Innovation in a health institution is the function of creative people far more than of the social system itself.*

TA PA U TD PD

*The working conditions of non-professional employees in a health institution have a direct bearing on the quality of health care given to patients/clients.*

TA PA U TD PD

*Usually a nurse has no formal power in a health institution.*

TA PA U TD PD

All of the above statements are concerned with "change." Part of a questionnaire of 39 related statements, they are rated by nursing and other medical personnel attending the workshop entitled "Change: Personal, Social, Institutional."

To date, four Change workshops have been given with a total of approximately 60 participants, including staff nurses and supervisors. Answers to the above questions are particularly significant, according to Sally Sohr, nurse coordinator for the workshop, because they indicate that most nurses see themselves principally as responders rather than initiators. "They have a low sense of power. They have no idea that they can influence change on the staff level." In fact, nurses attending other EMS workshops during the past two years recognize this and requested Change. They wanted assistance in solving problems they encountered in trying to implement new techniques and information gained in the other workshops.

The Change workshop, however, provides no formulas for instant change. Only about 25 percent of the time is allotted to lectures on the elements and process of change, resistance to change, and transactional analysis. The ma-

The spirit and pride he talks about are reflected in the comments of a 52-year-old ambulance driver Carlos Wood who, after a few days of EMT classes, said: "The four days I've spent here have meant more to me than the 16 years I spent around the hospital. . . . I used to check in for duty, put in my eight hours, and collect a paycheck, but now I feel I'm capable of something to help a patient. I feel I can be of help to the community, my family, and myself in case of any emergency."

If Carlos Woods and other Virgin Island EMTs have their way, the Islands will soon be known for a progressive EMS system as well as for lush vegetation, palm trees, and the Caribbean sun.

—Beverly Sopp

majority of time is spent working through group process: isolating and defining problems; individual values clarification; and problem-solving.

For example, one exercise consisted of prioritizing 14 qualities characteristic of a good nurse, justifying one's priorities to a partner, then joining a group of five people and arriving at a "group" answer narrowed down to the four qualities most essential to a nurse. The exercise is not as simple as it seems when one considers that all 14 qualities would be considered fairly essential—such as exercising good judgment, intelligent, honest, empathetic, sympathetic, tolerant, patient, taking pride in work, etc.

In more complex exercises, participants work in groups of five to define problems in given areas, such as patient advocacy, then complete group action plans. Participants work out problems themselves, with Ms. Sohr occasionally prodding them to ask the right questions. Because participants vary in age, education, experience, field of expertise, control of their work, etc., they often have different values and feelings regarding almost every issue. This often results in stalemates, but underscores the idea that a conflict in values results in the highest resistance to change. To be fully accepted, any change must begin on the personal level and involve the individual. For this reason, personal and social change is emphasized in the workshop as well as institutional change.

Most participants, according to Ms. Sohr, arrive at the workshop in the midst of change or thinking about change. They may have problems dealing with staff or administration; coping with work in stressful circumstances; realizing professional growth; expanding their role as nurses; or numerous other things. Many are concerned because they realize these problems also affect patient care. During the workshops, they begin to realize that there are no easy solutions, but they also realize they can take positive actions in spite of problems and, as nurses, they can be initiators as well as responders.

—Beverly Sopp



Star of Life II, the world's largest sea ambulance, is stationed at St. John.

Photos: Lou Jordan

## Maryland EMS News

Maryland Institute for Emergency Medical Services  
University of Maryland at Baltimore  
22 S. Greene Street, Baltimore, Maryland 21201

Address Correction Requested

325 E. Oliver St./Baltimore, Md. 21202

# CALENDAR

MAY

JUNE

- |       |  |       |  |
|-------|--|-------|--|
| 9-12  | Am. Assoc. of Critical Care Nurses, Annual Mtng. Contact: Warren F. Stevens, AACCN, P.O. Box C19523, Irvine, CA 92713  | 1     | Blood Gases, EMS Nursing Workshop, Woodmont Center, Bethesda, MD. Contact: Maryland EMS Regional Coordinators  |
| 12-13 | Emergency Management at an Airport Catastrophe, MIEMS & Balto.-Washington International Airport, BWI Airport. Contact: Program for Cont. Med. Ed., Univ. of Md. at Balto., 655 W. Baltimore St., Baltimore, MD 21201 | 1-2   | Spinal Cord Injury, EMS Nursing Workshop, Frederick Community College, Frederick, MD. Contact: Maryland Regional Coordinators  |
| 15-18 | Natl. Intravenous Therapy Assoc., Annual Mtng., San Francisco. Contact: Mary Larkin, NITA, 850 Third Ave., NY, NY 10022  | 1-3   | Cardiology Symposium: A Review of Changing Concepts, Management, Techniques, Therapies. Johns Hopkins Medical Institutions, Baltimore. Contact: J. O'Neal Humphries, M.D., Johns Hopkins Hospital, Baltimore, MD 21205 |
| 18    | Trauma Day, Central NY Acad. of Medicine, 210 Clinton Rd., New Hartford, NY 13413  | 2     | Management of Acute Medical Problems, Seattle, Virginia Mason Medical Center. Contact: Cont. Medical Ed., Virginia Mason Medical Center, 1100 Ninth Ave., Seattle, WA 98101  |
| 18-21 | Natl. Assoc. of EMTs Annual Mtng. and 1978 Ohio Assoc. of EMS 8th Annual Conf., Kent, OH. Contact: OAEMS Conference, Fred M. Mendiola, DeWeese Health Center, Kent State University, Kent, OH 44242                  | 7-8   | Change: Personal, Social, Institutional, EMS Nursing Workshop, Spring Grove Hospital, Baltimore, MD. Contact: Maryland EMS Regional Coordinators   |
| 19-20 | Emergency Room Pediatrics, SUNY at Buffalo, School of Medicine, 2211 Main St., Buffalo, NY 14214   | 8-9   | The Trauma Victim — An Interprofessional Approach, Interprofessional Council on Cont. Ed. & Univ. of Md. at Balto. Contact: Trauma Conference, c/o Laurence Katz, 500 W. Baltimore St., Baltimore, MD 21201            |
| 22-24 | Electrocardiography of Arrhythmias, Bethesda, MD. Contact: Am. College of Cardiology, Learning Center, 9111 Old Georgetown Rd., Bethesda, MD 20014   | 15    | Infection Control: Making It Work in the Hospital, Friendship International Hotel, Baltimore, MD. Contact: Md. Hospital Education Institute, 1301 York Rd., Lutherville, MD 21093                                      |
| 23-24 | Pediatric Emergencies, EMS Nursing Workshop, Doctor's Hospital, Lanham, MD. Contact: Maryland EMS Regional Coordinators  | 16-17 | Case Presentations, EMS Nursing Workshop, Cumberland. Contact: Maryland Regional Coordinators  |
| 23-25 | Crisis Intervention, EMS Nursing Workshop, Washington College, Chestertown, MD. Contact: Maryland EMS Regional Coordinators  |       |  |