Drill Tests BWI Disaster Plan

First to respond to the site of the BWI disaster drill on May 23, crash and rescue teams fan out to help the victims. See pages 4-5 for article and more photos.

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NEWS

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Trauma Registry Enhances Patient Care

A comprehensive registry of clinical data from several thousand trauma patients has been developed at the MIEMSS Shock Trauma Center. The computerized information system describes patients' injuries as well as treatment provided. The registry was designed in 1982 by C. Michael Dunham, MD, a surgeon at the Shock Trauma Center.

Dr. Dunham states that the registry was created in response to the need to gain a "panoramic" view of the effects of health care delivery by the MIEMSS Shock Trauma Center. It provides a chronology of the events that transpire from admission to discharge.

R Adams Cowley, MD, director of MIEMSS, notes the teamwork that created the registry and makes it function. "By collecting clinical information pertaining to the patient's entire hospital course," says Dr. Cowley, "we can generate a variety of data sets to evaluate our procedures."

Using the registry, investigators and clinicians can define and analyze variables that affect trauma patient outcome (survival and residual deficits) and therefore further improve patient care.

Trauma victims are subject to huge kinetic forces during an accident and receive a variety of injuries. Some will die at the scene; others, with appropriate care, will make it to the hospital and may die early in the hospital course. Others will survive with few or no complications. Some trauma patients will have a multitude of anatomic or infectious complications and still may die after a long stay in the hospital or may survive and require extensive rehabilitation to be socially reintegrated. The severity of injuries must be stratified, using tools such as the Injury Severity Score, Trauma Score, and the Glasgow Coma Scale, so that valid conclusions can be drawn from comparisons of health care delivery systems. With the trauma registry, medical personnel collect information about patients' injuries, complications, and treatment and analyze how those factors contributed to the person's condition after the traumatic insult. It also enables investigators to make recommendations about appropriate remuneration systems to cover the various professional and hospital costs associated with the care of patients with traumatic injuries.

Components of the Registry

The MIEMSS Shock Trauma Center registry is composed of information about patients brought to the Shock Trauma Center, the level I facility that treats the most severely ill and injured patients in the state. The registry focuses on the hospital phase of care (not the prehospital or rehabilitation phases). The data content has two major components: (1) the admisison profile, which covers the first 24 hours after admission, and (2) the hospital course, which covers the events after the first 24 hours up to discharge.

The *admission profile* consists of demographic data; preinjury information; physiologic data related to cardiovascular, respiratory, brain, and spinal cord function at admission; and delineation of anatomic injuries. The demographic profile includes information such as the race of the patient, the mechanism of injury, the time of injury, the time of departure from the scene of the accident, and the time of admission to the Shock Trauma Center. It is very likely that the time between departure from the scene and arrival at a definitive care facility has a direct impact on the outcome of many patients.

Since there is evidence that premorbid illnesses have an adverse effect

(Continued on page 2)

Clinical Trauma Registry in Use at STC

(Continued from page 1)
on patient outcome, an attempt is made to include information about such illnesses in the registry. Patient age also influences the results of injury.

The patient's preadmission cardiovascular stability or instability (for example, blood pressure, heart rate, and whether the patient experienced cardiac arrest) is important in the registry. Estimates of the degree of major external hemorrhage are entered into the system. Major external blood drainage during the first 24 hours is noted as well as the total amount of colloids, crystalloids, fresh frozen plasma, and blood administered. The use of cardiovascular medications (inotropic, pressor, and antidysrhythmic drugs) is recorded.

Respiratory insufficiency may be associated with significant hypercarbia or hypoxia, which is obviously detrimental to patients, especially those with brain or spinal cord injury. The admission respiratory rate, airway status of the patient on admission, and, if the patient is intubated, the time of intubation are added to the registry.

The Glasgow Coma Scale is used to describe the status of the patient's brain function. The anatomic component is delineated by a computed tomography (CT) scan of the brain, which is obtained at admission. Spinal cord function is noted as "normal," "complete deficit," or "incomplete deficit" at the various levels. The incomplete deficits are further subcategorized.

Anatomic Injury Recorded

A lengthy, in-depth series of descriptors allows the patient's specific anatomic injury to be recorded. Six major regions are used: head; neck; thorax; abdomen, pelvis, and perineum; extremities; and spine (see table). Within each of these categories are subdescriptors that more accurately define the anatomic derangement.

The *hospital course* refers to the clinically significant events after the initial 24 hours. In this section of the registry are noted various complications that may be sequelae of the initial injury or iatrogenesis from a major procedure: systems failure, anatomic complications, or infectious complications. The category "systems failure" requires the identification of the body system involved: respiratory failure, coagulopathy, renal insufficiency, etc. Well-delineated criteria are used for assignment of a patient's condition to a specific group, which enhances the registry's ability to sort out a group of patients with specific disorders. Rigid criteria for identifying infectious complications have been established by the infectious disease department of the Shock Trauma Center; therefore, common nosocomial processes are delineated clearly.

The hospital course component includes a description of diagnostic and therapeutic (operative and nonoperative) procedures. The nature of the surgical procedures is recorded, with start and end times for those done during the first 24 hours.

The patient's length of stay in the trauma center is recorded. Analysts also want to know the discharge status of the patient. If the trauma victim lived, his or her Glasgow Coma Scale score is recorded as well as information about cognitive function, extremity function, and spinal cord status. This information can be used to determine the patient's functional ability and potential for social reintegration. If the patient died while in the trauma center, the location at the time of death is included in the registry so that investigators can analyze procedures or processes that may have contributed to the patient's demise. It is important to know the dates of patient transfer between recovery units as well as the dates that complications occurred so that these data can be correlated.

Data for the MIEMSS Shock Trauma Center registry are processed in two steps: data collection and data entry. Admission profile information from patient charts is recorded on data forms by four dedicated data collectors within 24 to 48 hours after an admission. During the subsequent 48 to 72 hours, the trauma team attending surgeon for that patient reviews the data to ensure their accuracy. The hospital course data are obtained in a similar system: the same data collectors retrieve certain information, while the critical care and surgical attending physicians of the patient provide the necessary sophisticated interpretations of patient care information. The physician-verified information is then entered into a computer system by personnel in the MIEMSS Operational Research and Systems Analysis Department.

Type	Number
Craniofacial	3252
Extremities	2223
Thorax	1704
Spine	1285
Abdomen, pelvis, & perineum	1241
Neck	155

A sample of the information available to users of the MIEMSS Shock Trauma Center registry is the table showing the type and number of injuries in 5,390 patients admitted to the MIEMSS Shock Trauma Center (July 1983 – June 1986). According to the data, 1.83 body regions are injured per patient. Clinicians also use the registry to generate much more complex tables indicating the relationships of many variables.

To effectively manage the huge amount of data, the entry process at first included only admission profiles. As of June 1986, data on 5390 patients had been entered into the computer. By June 1987, it is expected that information on approximately 8000 patients will be processed. Collection of the hospital course data began in February 1985. A year later, in-depth hospital course data for 4000 patients had been captured.

Applications

Clinical registries can be used to compare the effectiveness of health care centers. If the mortality rate at Trauma Center A is 4 percent lower than that at Trauma Center B, is Center A more effective than Center B? To make accurate comparisons of treatment facilities, variables such as severity of injury and patient discharge status must be controlled, and trauma registries provide a means for that.

In designing the MIEMSS Shock Trauma Center registry, Dr. Dunham was most interested in assessing the treatment protocols used in the Shock Trauma Center. The registry is unique in its scope: no other trauma registry encompasses as many patients, as great a depth of information, and as high a degree of accuracy as the MIEMSS system. This sophistication provides many capabilities to investigators in their coordination of resources and evaluation of medical procedures.

The MIEMSS Shock Trauma Center registry is used to monitor the amount of blood administered to trauma patients during the first 24 hours after admission.

(Continued on page 8)

How to Assess Medical Emergencies

Medical calls differ from those related to trauma because most medical conditions are not an immediate threat to the patient's life. A little time can be taken to treat the patient. Proper assessment gives the prehospital care provider an idea of how much time can be spent in initial treatment.

"It is necessary to prioritize assessments," says Judy K. Bobb, RN, MSN, critical care program coordinator for MIEMSS field nursing. "Patients who need help and not questions are those with obvious heart attacks, bleeding, respiratory distress or who are unconscious. Airway obstruction, shock, and a serious heart attack can kill quickly. The foundation for assessment, no matter what the patient's problem, is to check the ABCs and respond appropriately."

After checking the ABCs, there should be a general assessment of the patient's status in an organized, comprehensive way. Observations made during an assessment can be compared to the deductions made by Sherlock Holmes, "except that Sherlock had to find his clues but ours are right there," Ms. Bobb says. The three most important elements of an assessment are the quality and nature of the complaint; the physical aspects of the illness, and the time involved in the onset of symptoms. Much can also be learned from facial expressions, body language, and the patient's instinctive actions.

Medical assessment begins with asking the patient questions that would be helpful in defining the extent of the problem: what medications does the patient take; does the patient have allergies; who is the patient's physician; and when was the last time that the patient saw a physician. The next step is learning the history of the chief complaint. For example, suppose an ambulance is called because the patient has chest pains. Questions to ask include:

- Does the pain stay in one place or move? The classic presentation of a heart attack (70 percent of cases) is chest pain that radiates from the chest to the inferior aspect of the left arm. Heart pain less frequently radiates to the jaw or to the right arm. (Many people don't understand the word "radiate," so it is best to ask if the pain moves. Chest pain from other causes such as pleurisy and pneumonia typically does not move.)

The patient should be allowed to describe how he feels in his own way. It can't be assumed that if a patient says he does not have pain he is not experiencing the symptoms you are looking for. Sometimes people don't realize that they are having symptoms. If you ask, "Do you have pain?" the patient might say no. However, if allowed to describe how he feels the patient might give important information such as having a squeezing feeling or pressure in his chest or feeling heavy, weak, or tired. "Try using prompting questions," Ms. Bobb says. "For example, 'What is it like? Where is it? Can you describe it?' Try to learn everything about the symptoms including what starts them, what stops them, and whether anything the patient does can make them better or worse."

- Was there a sudden or gradual onset of symptoms? This might indicate which body systems are involved. People with heart attacks are usually feeling good one minute and have symptoms the next; people with pneumonia know that they have been feeling sick awhile.
- How often do the symptoms occur? When did they start? Were there any associated activities such as walking, resting, or watching TV?
- Do the symptoms seem to be related to the time before or after meals?

While you are asking these questions, observe the patient. Decide whether he is awake enough to give general status information. Notice what position he seeks for maximum comfort. While a person with a broken leg is most comfortable stretched out in a flat position, a person with trouble breathing cannot lie flat; he will fight to sit upright. An asthmatic will probably sit up, lean forward, and put his arms up if he can. A person with a heart attack will sit up but not put his arms up because it takes too much energy. He wants his body to be supported. The body instinctively seeks its most comfortable position.

Someone in diabetic distress may be unconscious and hyperventilating and may have tachycardia and moist skin.

Look closely at the patient in relation to the respiratory system, but look all the way to the abdomen. Is there nausea, vomiting, or pain; is the structure of the abdomen flat, distended, or obese? Are there scars that might give you insight about the patient's problem? How is his breathing reflected in the abdomen itself; most people breathe with both the chest and the abdomen a little. If there is distension there might be an infringement on the diaphragm. A change in the respiratory pattern with abdominal rigidity might indicate that the diaphragm is pushed out of place.

Watch for body language. Sometimes a patient with a heart attack will unconsciously rub his chest or arm because it "feels funny." A patient who has a bad heart attack may try not to show his fear, but will look distracted, will hold very still, and deny anything is wrong.

An asthmatic will begin to sound tight, his respiratory pattern will change, and his breathing will tend to become more rapid and shallow. You may be able to hear his breathing without a stethoscope. A person suffering from anaphylaxis might be scratching as a sign of the allergic reaction.

The important thing to remember, says Ms. Bobb, is that the prehospital care provider must change his "mind set" when he is called to treat a medical emergency rather than one due to trauma. Since there are more ambulance calls made for medical emergencies than for trauma emergencies, knowing the strategy behind making assessments can help the provider to do his job more efficiently and to improve patient care.

—Erna Segal

ParaScope '87 Slated

"It's a Small World" will be the theme of ParaScope '87, focusing on pediatric emergencies. The conference, sponsored by the Montgomery County Emergency Medical Services and Department of Fire and Rescue Services, will be held August 28–30 at the Bethesda Marriott Hotel.

For information, contact Capt. Mary Beth Michos or Lt. Willa Little at 301-279-1834.

Hearing Screening Held

More than 150 children and adults participated in the hearing screening for the community that was sponsored by the speech-communication disorders program of MIEMSS and the Montebello Rehabilitation Hospital on May 27. Brochures and community referral resources were available to individuals with a suspected hearing loss. May was designated as "Better Speech and Hearing Month" by the American Speech-Language-Hearing Association.

Many Participate in BWI Disaster Drill

Response to a simulated air crash supposedly caused by a wind shear tested the coordination between the command structures of BWI Airport, Anne Arundel County, and MIEMSS on May 23. The "plane" made premature impact with the ground, strewing debris and "victims" over both airport and adjoining Anne Arundel County property, thus involving both jurisdictions.

According to the scenario, there were 75 dead and 75 injured passengers. Dead passengers were symbolized by balloon-filled body bags; injured passengers were moulaged volunteers. "The drill was planned with Murphy's Law in mind," says BWI Airport Fire Chief Rudy Sagan, "so we planned it to take place early in the morning on a holiday weekend."

In addition to the BWI Fire and Rescue Services and the Anne Arundel County fire and police departments, participants included the MIEMSS Shock Trauma Center and field operations programs; the Maryland State Police, with units from the airport, crime lab, and aviation division; and the Baltimore City, Baltimore County, and Howard County fire departments.

Other groups taking part were the Anne Arundel County Alarmers; Box 234 Association; Box 414 Association; Civil Air Patrol; Fort Meade Hospital; University of Maryland Medical System; North Arundel Hospital; State and Federal Aviation Administrations; Butler Aviation; State Medical Examiner's Office; airline representatives; and ham radio operators. "Go Teams" of doctors and nurses were sent out from the MIEMSS Shock Trauma Center.

EMS Division Chief Roger Simonds (Anne Arundel County Fire Department) directs on-scene EMS activities.

Also on the scene were Ameen I. Ramzy, MD, state medical director and state EMS director, and Roy A.M. Myers, MD, MIEMSS director of hyperbaric medicine, who are also fire surgeons for the Baltimore County and the Anne Arundel County fire departments, respectively.

Many innovations were tried out during the drill. BWI Airport used its new disaster supply truck, a portable warehouse in a tractor-trailer that, it is hoped, will someday be filled with enough medical supplies and equipment for 300 patients. The Maryland State Police Crime Lab mobilized its disaster team, marking and photographing positions of bodies and body parts, and making a scale drawing of the scene.

MIEMSS tested the revised field operations disaster plan, refining emergency response procedures and better defining the incident command structure. MIEMSS also provided portable computers for patient-tracking; it is hoped that eventually lists will be integrated from helicopters, ambulances, hospitals, and the morgue. MIEMSS is considering whether to create stockpiles of disaster supplies at various locations around the

(Continued on page 8)

Ambulances and response vehicles line up prior to the drill.

BWI Airport's new disaster supply truck.

Moulaging patients prior to the disaster drill.

Reassessing a patient in the holding area.

Paul Schurick (Governor's Office) and Dr. R Adams Cowley

Ken Young (MIEMSS Prehospital Care Office) and transportation officer Lt. Henry Burris (Baltimore City Fire Department) "track" patients on the computer as they are moved from the disaster drill site.

Anne Arundel Alarmers Association provided food and drinks for the drill participants.

Removing a patient from the disaster drill site for transport.

BWI Airport Fire/Rescue Services were the first to respond to the disaster drill site.

(L-r) Bill Sabatino (safety coordinator, State Aviation Administration) and BWI Airport Fire Chief Rudy Sagan discuss disaster drill operations.

The chief investigator for the State Medical Examiner's Office Bill Macemore (front, third from left) works with funeral home representatives and the MSP identification team.

(Left) Prince Georges County Fire Chief "Jim" Estepp and Director of EMS Field Operations William E. Clark with Region V care providers Lt. William King, Sgt. Jim Miller, and Brother Robert Lindsay, receiving CRT instructor recognition awards at the EMS Care '87 banquet. (Right) More than 350 attend EMS Care '87.

Over 350 Participate in EMS Care '87

More than 350 EMS care providers from eight states attended EMS Care '87 at the Greenbelt Hilton and Towers in April. The conference was sponsored by the Region V EMS Advisory Council and MIEMSS and hosted by the Prince Georges County Fire Department. Twenty-five workshops and lectures were offered. Edward Koenigsberg, MD, of the US Office of Foreign Disaster Assistance, part of the Agency for International Development (AID), was the luncheon guest speaker.

The medical staff of Prince Georges Hospital Center (PGHC) provided funding for Saturday's continental breakfast, and Southern Maryland Hospital Center provided hors d'oeuvres at the dinner-dance Saturday evening. Dimensions Health Corporation provided "mocktails" and soft drinks as part of their effort to prevent drinking and driving.

The cost of the dinner was kept to a minimum through the generosity of various sponsors who wished to express their thanks to the men and women of the EMS system: Agusta Aviation Corporation; AMI Doctor's Hospital; American Trauma Society, Maryland affiliate; Lawrence Blob, MD, Emergency Department, PGHC; Calvert Memorial Hospital; Capital Emergency Associates of Greater Laurel-Beltsville Hospital; R Adams Cowley, MD, director of MIEMSS; Critical Care Associates at PGHC; Said Daee, MD, trauma surgeon, PGHC; Dimensions Health Corporation; Greater Laurel-Beltsville Hospital; Carlos Gordillo, MD, and Bakulesh Patel, MD, trauma surgeons at PGHC; J. Patrick Jarboe, MD, St. Marys Medical Director; William Joseph, MD, Emergency Department, Southern Maryland Hospital Center; Leland Memorial Hospital; Thomas Lyons, MD, PGHC; Med-Search Systems and Survival Technology; the medical staff at PGHC; Montgomery General Hospital; ORCO, Inc.; Physicians Memorial Hospital; PEPCO; Region V EMS Council; MIEMSS Shock Trauma Physicians; Southern Maryland Hospital Center; Suburban Hospital and Robert Rothstein, MD; and Washington Adventist Hospital.

US Response to Disasters Described by Koenigsberg

Since September 1985, when Mexico City experienced an earthquake that registered 7.5 – 8.1 on the Richter Scale, there has been a change in the nature of disaster assistance from the United States that is requested by foreign countries.

Edward Koenigsberg, MD, from the Agency for International Development (AID) Office of US Foreign Disaster Assistance, described these differences when he spoke to the lunchtime audience at EMS Care '87.

According to Dr. Koenigsberg, traditional response from the United States in a disaster was to send blankets, tents, money, and technology to reestablish the water system. Originally Mexico did not ask for help. But when the magnitude of the disaster was realized — there were ultimately 30,000 injured, 6,000 hospitalized, 8,000 dead, and the loss of 5,000 hospital beds at three hospitals — help was requested.

Among those sent by the United States were 10 personnel from the Federal Emergency Management Agency; 8 from the National Organization for Victim Assistance; 68 from the US Forestry Service; and 5 from the Bureau of Mines, along with equipment similar to an endoscope to look for buried people and a machine to pick up vibration and sound. There was also a military medical supply expert. Dr. Koenigsberg said that Metropolitan Dade County [Florida] Fire and Rescue Services were particularly valuable because they are multilingual. There were also 13 rescue dogs and 17 dog handlers.

Other countries also sent help; the disaster was extensive enough for each country to be assigned to a different location, thus eliminating friction between rescue groups with different methods of operation. There was controversy over how much time should be taken to rescue one or two people when so many

(Continued on page 7)

Dr. Edward Koenigsberg

(Continued from page 6)

needed help and whether everything should stop to enable the use of listening devices or digging should progress quickly to save more people.

"It is up to the host country to run the disaster scene; our teams helped out as advisors, diggers, and in setting priorities," Dr. Koenigsberg says.

Medical supplies were sent to Mexico City by well-meaning donors, but were not packaged in a way that could be useful. Various kinds of medicines were placed in the same box, and when they were unpacked by non-English-speaking people, they did not understand what the medicines were; however, the sorters could understand the expiration dates, so if the drugs were approaching the expiration date they were thrown away. After the rescue was completed in Mexico City, best estimates were that between 90 and 95 percent of the medicines were never utilized by patients.

Mobile hospitals were not needed in Mexico City; even with the loss of 5,000 beds, local facilities could adequately handle the patients. However, mobile hospitals were used in the mud-slide disaster in Colombia, South America, in which 5,000 were injured and 22,800 were killed, buried in the mud. Search dogs would sink in the mud. Getting people out was a job for helicopters, not search-and-rescue personnel. The US Southern Command, in Panama, sent in 12 med-evac helicopters. There were also disaster teams from France and Japan. One of the problems encountered in the Colombian disaster operation was a lack of communication between the foreign doctors and the local medical establishment. For example, local medical personnel had decided that there would be no primary wound closure; wounds would be left open. However, some foreign teams in mobile hospitals did not realize this and made primary wound closure, with the result that some patients got gas gangrene. Their wounds needed to be reopened, and the patients were sent to Bogota for treatment. There was no vaccine available, and hyperbaric oxygen was not used.

Another disaster in which Dr. Koenigsberg and the AID team participated was in Cameroon, Africa, where a poisonous cloud arose from a lake and killed 1,700 people and 3,000 cattle immediately. There were also 500 people hospitalized. Adding to the mystery, the lake turned red. In this case, the United States did not send search-and-rescue personnel, but a team of scientists: pathologists and a photographer from the Armed Forces Institute of Pathology, geologists, vulcanologists, limnologists (who study lakes), water chemists, and Environmental Protection Agency personnel. In the rain, the AID team exhumed bodies from the mass graves to do autopsies and later talked to survivors. It was proposed that a rock slide into the lake caused carbon dioxide in solution to be released as a deadly gaseous cloud. The lake turned red from the action of the carbon dioxide that brought up iron from the lake bottom. When it reached the oxygenated top water it created ferric hydroxide, and the water turned rusty red.

For rescue operations in San Salvador where an earthquake left 10,000 injured and 1,000 dead, AID sent four dogs and six dog handlers. In addition, the Dade County rescue team again participated. There were also rescuers from Switzerland, Costa Rica, France, Guatamala, Japan, and Venezuela. Because of language barriers and a weak chain of command, many misunderstandings developed. For example, the Americans were using an old dynamite box as a receptacle for their supplies; the Swiss thought the Americans were about to blow up the buildings. Some teams wanted quick search-and-rescue action; others wanted the action stopped so they could hear with their listening devices.

In an effort to clarify a future course of action, AID met with the Pan American Health Organization in Costa Rica in 1986 and in Mexico in 1987. These meetings produced the following guidelines:

1. Relief should be given only if it is requested by and coordinated with the host country. Well-meaning but unrequested medical personnel become part of the problem (for example, finding lodging, translators, and food for them), not part of the solution. The first few hours after a disaster are the most crucial; help coming after that is often not needed.

2. There should be an effort to improve medical assessments.

3. Donations of cash and credits would be very useful.

4. Drug companies will be asked that large amounts of drugs be packaged with only one kind to a crate and labelled generically, with Spanish terms.

5. Specialty groups (such as the medical and EMS personnel that specialize in mine collapse rescues) are very useful and should be brought to the attention of AID so they can be asked to assist when necessary. Medical groups interested in providing disaster relief should know the language and have prior disaster training. There is a need for bilingual, EMS-trained or emergency-department physicians to be part of medical assessment teams.

6. Light- and heavy-rescue equipment should be compatible with equipment used worldwide. *—Erna Segal*

Tri Towns Promotes Safety on Prom Night

Far too often prom night is a busy time for an EMS system. What is supposed to be a memorable evening of joy for teenagers can, and often does, become a nightmare. Late night driving, alcohol and drugs, speeding and not wearing seat belts can result in tragic accidents.

To combat this, Tri Towns Rescue Squad in Westernport has initiated a special public-safety program. As the teenagers danced at the prom, squad members were in the parking lot placing flyers on the windshields of their cars. The flyers urged them to have a nice time but to drive carefully and buckle-up.

According to Francis Mowbray, ambulance captain, "by doing this during the dance, we may prevent an ambulance run after the dance requiring the delivery of emergency care to a son or daughter of our neighbors."

The program has been so successful that Tri Towns has begun using it for community parties and dances.

—Dave Ramsey
Region I Administrator

Readers Take Note!

If you're receiving more than one copy of the newsletter, please let us know. Send the mailing labels that you want to have deleted to the Editorial/Publications Office, MIEMSS, 22 S. Greene Street, Baltimore, MD 21201 or call 301-328-3248.

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Clinical Trauma Registry in Use at STC

(Continued from page 2)
Because the most severely injured patients are brought to a level I facility, a tremendous amount of blood is used; therefore, strong backing from a blood bank is essential. Knowledge of this need is integral to a trauma center's planning and use of resources.

To study airway management and endotracheal intubation in patients with possible cervical spine injury, Dr. Dunham looked at data from patients with blunt injuries, who were admitted directly from the accident scene and who required immediate intubation. The registry revealed 444 such patients over a 2-year period. Using the registry, he determined that 35 (7.8 percent) of those patients actually had cervical spinal cord or column injury. Health care providers should certainly continue to be cautious when intubating such patients and to maintain in-line traction. Statistical analysis reiterates that, when urgent indications are present, a patient should not be denied intubation because the care provider is worried about neck injury.

Clinical protocols can be evaluated with the registry. For example, approximately 50 percent of patients admitted to the Shock Trauma Center are intubated in the first 24 hours. To determine whether techniques other than translaryngeal intubation are required, Dr. Dunham used the registry to calculate that only 1.2 percent of patients need cricothyroidotomy within that initial period. The rest can be managed with translaryngeal intubation by the nasal or oral route.

Data from the registry also help determine the kinds and numbers of support services needed for adequate patient care. Of 1651 trauma patients admitted in one year, 27 percent had either major spinal injury or contusions. Thus, major support from the neurosurgical and orthopedic departments is necessary when a center provides care for a large number of blunt-injured patients. This type of information assists administrators in their decisions about the hiring and scheduling of staff members.

Continuing evaluation of the MIEMSS Shock Trauma Center registry will lead to improvements in the system: perhaps some information can be dropped and other categories will need to be added. The registry enables clinicians and administrators to identify strengths and weaknesses in the trauma care system. By delineating these factors, research can be directed to the appropriate areas, with the ultimate goal of improving patient care.

—*Linda Kesselring*

Responding to BWI Disaster Drill

(Continued from page 4)
state, or to have portable disaster kits that could be flown in or locally stored. SYSCOM and EMRC performed their usual bed status and medical communications.

As part of the National Disaster Medical System, ham radio operators used their emergency network to perform a communications drill to contact distant hospitals and develop an extended bed-status list from areas not usually covered by SYSCOM, such as tidewater Virginia.

The Anne Arundel County Fire Department is updating its communications with a new trunking system that should be in operation in 1988. Chief Roger Simonds explains, "This should greatly improve our capabilities for the next BWI disaster drill, which will be in two years." Chief Simonds says that although the units worked well together, it would be helpful if they all used the same terminology based on the National Incident Management System, thus avoiding misunderstandings.

It was agreed by Chief Sagan, Chief Simonds, and MIEMSS Director R Adams Cowley, MD, that the drill was a good test of the airport's disaster plan and that the various local, state, and federal groups worked well together.

Dr. Ramzy said: "Active participation by multiple agencies in drills such as this pays off not only in the event of major incidents, but also in improving day-to-day activities."

—*Erna Segal*