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EVALUATION

Barbados Emergency Medical Systems Project

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Evaluation Summary

During Spring and Summer 1983 a cooperative program was developed to improve Emergency Medical Services at Queen Elizabeth Hospital, Barbados. The initial surveys revealed many problems of organization, quality of care, and efficiency with the result that "patients do not receive necessary, rapid, and adequate care". The project was later expanded to cover the pre-hospital phase, thus establishing the goal of improving the full, comprehensive EMS System.

Based upon my evaluation, which included site visit, interviews, and review of documents, my finding is: Overall the project has made substantial improvements and has had a high degree of success in meeting program objectives. The project has transformed what was an unsatisfactory casualty area with inadequate staffing, inefficient and chaotic organization, into an Emergency Department with improved staffing and organization, improved quality of care, defined goals, and leadership. An impressive pre-hospital ambulance program with trained EMTs has been established. Further, a heightened sense of awareness of what is needed for a safe and efficient EMS System has been instilled in the staff.

Remaining problem areas are discussed. Several of these are inherent in the 'emergency-room system', compounded in this facility with its unsatisfactory and too small Emergency Room physical plant.

Though these substantial improvements have occurred, the Emergency Department has not yet achieved its full potential of a high-quality E.R. A series of recommendations is presented: first, to help in maintaining and improving the present levels of achievement; a major one being the importance of recognizing that EMS is a dynamic system requiring significant effort just to maintain improvements that have been made and secondly to give suggestions that might help future projects.

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Introduction

During the spring and summer of 1983 a Cooperative Program was developed among Barbados Ministry of Health, U.S.A.I.D., University of West Indies School of Medicine, and Project Hope to provide technical assistance and training to improve Emergency Medical Services at the Queen Elizabeth Hospital (Q.E.H.). This initial plan was subsequently expanded to develop a pre-hospital program as well. The initial evaluation documents developed in March-April, 1983 accurately describe the problems. The plan for improvement was formalized in the memorandum of understanding signed by the four parties noted above. Upon completion of the project, U.S.A.I.D. has requested an evaluation of its success and impact. This evaluation was performed by me during October, 1985.

I. Method of Evaluation

1. Review of documents mailed to me by U.S.A.I.D.
2. Overview and orientation at Hope Headquarters in Millwood, VA., where goals, philosophy, and accomplishments were outlined, October 15.
3. October 16-21: On-site visit to Barbados which included:
 - A. Daily hospital visits; interviews with ER staff, hospital administration, Chief of Staff, Professor of Surgery; review of E.R. Log.
 - B. Polyclinic visit (Ladymeade), 10/21
 - C. Review of pre-hospital program (geography and roads by tour of Island; ambulances; radio communications; interviews with EMT's; review of ambulance runs.)
 - D. Visit and discussions with U.S.A.I.D. staff, October 17, 18, 21, 25.
 - E. Attendance at Multi-Agency Disaster-Preparedness Panel, October 21.
4. Phone discussion with Karess Ebert, R.N., Minnesota - October 25.
Phone discussion with Don Weaver, HOPE - October 25.

II. Findings

1. Overall, the assessment of the problem was accurate, and the project objectives and implementation plans were clear, reasonable, and for the most part achievable.
2. Overall the project has made substantial improvements and has had a high degree of success in meeting the objectives. These achievements are well seen by applying the standard EMS evaluation with its review of the components of an EMS System. The problem outlined in the initial surveys will be summarized, then accomplishments noted.

A. Manpower

Problem: "Insufficient physician staff. No full-time Director and therefore lack of leadership, supervision, and administration; inefficient triage and identifying patients in need of urgent care; insufficient number of trained ambulance attendants; lack of secretary forces nurses away from necessary clinical duties; adequate number of nurses, but inadequate training".

Accomplishments

- A full-time Director has been hired. The department affiliation with W.I.U. will further help in maintaining quality standards.
- 42 EMTs were hired and trained.
- 14 physician positions established, with work shifts staggered to give increased coverage at peak times. (12 employed at time of survey).
- An E.R. secretary/clerk has been hired, thus relieving the busy nursing staff.
- A triage - nurse position has been developed and assigned.

B. Training

Problem: "Basic and more advanced training in Emergency Medicine is lacking at all levels, including physicians, nurses, house officers. In addition, basic level of training should be given to ambulance attendants".

Accomplishments

42 EMTs were trained in the initial class (Fall-1984), including four EMT Instructors. The instructor group have themselves subsequently trained another group of EMTs (Summer-1985).

- Nurse training carried out in summer 1985 for 26 nurses. Interviews with nurses and physicians suggests that this training was not only well-received, but was quite successful in heightening awareness and performance.
- E.R. Director meets monthly with EMTs, weekly with E.R. physicians, weekly with E.R. nurses. He has also presented at the General Hospital conference.

C. Communications

Problem: "Need a simple radio communication system between E.R. and ambulance". "Need pagers to contact on-call consultant staff".

Accomplishments

- Radios have been installed in ambulances and at ambulance base station to allow efficient dispatch. The hospital radio has not yet been hooked up (awaiting a transformer); thus the critical element of medical control is not yet effected. Hospital plans to have the radio installed soon. On-call consultants now have pagers.

D. Transportation

Problem: "Old ambulances, frequently broken down; need for minimum equipment".

Accomplishments

Three ambulances are now in service, with radios and standard ambulance equipment. It was disconcerting to hear that the 4th ambulance, which is down for repairs, had a disapproval of the funds necessary to get it back in service. Plans are to purchase four new ambulances, and two older ambulances will no longer be regularly used. For the resulting fleet of five there are radios, but added equipment will be needed.

E. Emergency Facilities

Problem: "300-400 patients per day; theoretical triage program in place, but in reality patients are seen on first-come, first-serve basis, with inadequate attention given to seriously ill or injured. Inefficient layout of space, inadequate number of rooms, and no separation of patients into urgent v.s. less-urgent. This predisposes to chaotic, inefficient, and unsafe management. Physician availability occasionally not assured due to lack of staff and improper scheduling".

Unsafe and wasteful mechanisms of drug ordering and control; E.R. not infrequently runs out of needed medical supplies. Polyclinic initially planned to be source of primary care, but inadequately staffed and open only noon to 4:00 p.m.

Accomplishments

- **Queen Elizabeth Hospital Emergency Room.**
A heavy patient load still presents here, but now 200-300 patients per day. The majority of these are of the clinic/dispensary type with some needing more urgent care; relatively few present with life-threatening emergencies (for perspective, throughout the U.S. about 80% of patients who access emergency services are not true emergencies, about 15% require urgent care, and about 5% are critically ill and injured. This pattern is similar at Q.E.H.) To cope with this the following have been successfully instituted:
 - a. A triage program is in place whereby a triage nurse assigns patients by urgency of care needed and directs them to designated areas of urgent or less urgent. Internal renovations were made to allow this more efficient use of space, and more examining rooms were added.

- b. Improvements have been made in materials management including inventory, ordering, control, and re-stocking of drugs, supplies and equipment.
 - c. Physicians are assigned on staggered shifts to meet the needs of peak loads, and physicians are now available in the department at all times.
 - d. E.R. policies are developed such that most patients needing surgical intervention are taken to the surgical ICU: i.e., chest tube insertion, central-line, peritoneal-lavage, etc. (This practice is presently under consideration by clinical chiefs of services as to whether better to use E.R. or ICU; I favor the use of the E.R.).
2. A new, and impressive ambulance center has just opened, which also serves as the dispatch center. This is located across the street from hospital.
 3. The polyclinics have now extended hours to 8:00 p.m., to help in taking some of the load from the E.R. This has resulted in E.R. load dropping from about 300-400 per day to about 200-300 per day. The pediatric clinic load has been almost halved. One of the goals was to re-appoint many of the patients from the E.R. to the polyclinics; however, the health professional is loath to turn away someone asking to be seen. Partly this is based upon compassion, partly upon the knowledge that though the problem may sound routine, the patient could have something more serious. Obvious non-urgent problems are re-appointed, but if there is any question, the staff will work the patient in at the time and this is right. The system of triage has helped in decreasing the numbers going to urgent areas, but the overall load remains high. The increased use of polyclinics is primarily by self-referral through public education and awareness.

F. Critical Units (In-patient Services)

Problem: Not discussed.

Accomplishments

This was not an area to be specifically evaluated, however it is important to know how the in-patient units work with the E.R.: In general, I feel the hospital is adequately staffed and prepared to handle the type of patients presenting at Q.E.H. E.R.; patients needing more sophisticated care are referred to U.S., Canada, Great Britain, etc. Inter-relationship problems are discussed later.

G. Medical Records

Problem: "Recordkeeping is poor and confused. Emergency records cards are kept in Records Department in casualty area, separate from in-patient record which could have valuable information re: previous illness, medications, allergies. This in-patient record is not routinely available except by request and only during week day day-hours".

Accomplishments

This same practice continues. The lack of a unified medical record makes the present system unacceptable. The goal here is to develop a system which can track the patient from ambulance system through the E.R. and should be integrated with polyclinics. This is a major task for hospital administration.

H. Coordination with Public Safety Agencies and Disaster Planning

Accomplishments

A multi-agency group of Fire, Police, Ambulance Service, M.O.H., Defense, Emergency Communication is in place, and they have jointly participated in disaster preparedness. Documented activities have included joint fire drills, disaster drills, cooperative training efforts, joint activities planned during EMS Week. Though this group pre-dated the project, its activities and interactions have increased during the project.

I. Public Education

Problems: Not discussed.

Accomplishments

Efforts have included presentations on radio, T.V., and the press. I am not aware of formal efforts at including public representation in planning and review activities, but the recent EMS panel discussion during EMS Week gave opportunity for a public forum.

In summary, the above achievements have transformed what was an unsatisfactory Casualty Area with inadequate staffing, inefficient and chaotic organization into an Emergency Department with improved staffing and organization, defined goals, improved quality of care, and leadership...And, have developed and implemented an impressive pre-hospital system of response and transport. Further, though less tangible, the project has developed a heightened sense of awareness of what is essential for a safe and efficient EMS System.

These are a direct result of the project.

III. Remaining Problem Areas

Though the above improvements are in place, is the system functioning as all had hoped for or expected?

For the pre-hospital program, in general the answer is yes; there is an adequate number of trained EMT's with high morale, esprit-de-corps, who seem eager to serve and eager to learn. Mr. Warren Schaub is to be complimented. We will be anxious to see when the hospital-based radio is installed; what will be the response to those situations where maintenance and repair is needed; what will be the success in maintaining present staff and recruiting for vacancies.

For the hospital, E.R. problem areas remain, and it is important to explore and discuss these.

1. First and very importantly, we must recognize there are problems that are inherent in a busy city or county-hospital type E.R., whether this is Boston City, Cook County Chicago, New York, or Barbados, Q.E.F. In a phrase, this can be summarized as departments with "high professional demand/low professional satisfaction".

There is a large flow of patients, many of whom do not need to be there. For the professional there is not time to develop rapport with patients that does occur on in-patient services. With long lines of seemingly never-ending patients, there is a psychologic tendency to ask "why are you here" rather than "what seems to be the matter". In the case of the critically ill there is no question, therefore the patient is well-accepted, and the professionals give their all. But the less-ill are often met with an attitude (spoken or un-spoken) of "you should not be here". Indeed this problem is now affecting the more affluent HMO populations, and the Kaiser Health Group has discussed their problems with the "walking well" in a system where emergency care is free.

2. Physician staff - the physicians do not have formal E.R. training, and many are not oriented to a career in E.R. Medicine. Several have other specialty interests and are desirous of getting positions in these areas. They give good service and hard-work on a day-to-day basis, but under such circumstances one would not expect long-term committment. They are relatively weak in the area of major trauma and intensive care, but as noted, these types of cases are not common.
3. A major task was to modify attitudes and behavior in many of the hospital and E.R. staff, and of course , this is a difficult task anywhere. Many of the staff have been there many years, have set attitudes and patterns of action; and plans for change are often met with passive resistance. The Project worked on this, and I observed that there are on-going efforts in this area.
4. The recent nurse training has gone far to heighten awareness, and improve performance, but in and of itself is not enough to expect major modifications in behavior unless there is continued encouragement by physician staff and nursing leadership. These concepts of E.R. skills and EMS management should be incorporated into nursing school and medical school curricula. As this is done we will see a quantum jump in the efficiency and quality of emergency care.
5. Laboratory and X-ray

Problem: "Often takes many hours to obtain lab and x-rays due to fact that technicians not in hospital nights and weekends. A problem requiring immediate correction". In the M.O.U: "M.O.H. will seek to have established sufficient positions to allow 24-hour coverage of these important services".

These plans have not materialized. Lack of funds was the given reason. The need remains for improved responsiveness both during day and after-hours.
6. Inter-relations with in-patient services remain less than optimal. Consultants do not respond with the rapidity which E.R. staff expects. The planned inter-department meetings have just started, and I am told this issue will be presented.
7. Though not a 'remaining problem', it is worth noting: after the Project started it became clear that efforts at program development had to be more comprehensive than could be expected of a lone physician consultant. For future EMS efforts it may be appropriate to start with the team concept of medical director, pre-hospital consultant, and nursing consultant.

8. **Physical Plant:** Improvements have been made to better use the existing space in this inefficiently laid out E.R. Still, it remains a difficult, cluttered, and inefficient area for handling the large numbers of patients. Further significant improvements will be dependent upon the major renovation program now underway. Some further modifications of the present department are being considered and they will be of some help; the major need is for more room.

IV. Project Administration

I have been charged with responsibility to comment on this topic. This is an area that is best addressed and monitored through internal controls on a day-to-day basis, rather than after-the-fact where it is often difficult to reconstruct situations. The U.S.A.I.D. mission official who briefed me expressed criticisms of "project oversight and accountability", primarily in the closing months of the project. She proposed the question to me: "Is this reflected in a deleterious way in program accomplishments?" My answer is: No.

During the main time of the project there was on-site program direction, and from what I can see, Project Administration during this time was appropriate and effective. Once the primary program at the Emergency Department and pre-hospital phase ended, the decision was made that it would not be cost-effective to maintain a project administrator on-site. I concur with this judgment. Once this decision was made, the project participants committed themselves (whether they realized it at the time or not) to the need for cooperative partnership. It thus became a "foregone conclusion" that there would be difficulties in trying to oversee day-to-day problems by long-distance phone, and more of the on-site work would thus fall to A.I.D. staff. This trade-off was done in the name of cost-efficiency, and in retrospect it still seems to be a reasonable decision.

A.I.D. staff therefore were called upon more than usual, and they should be credited for their response and performance.

I do not mean to gloss over any rough edges, but more importantly I do not want to lose sight of the ultimate result that this is a successful program that reflects well upon the AID-HOPE partnership.

The frustration with getting the radios installed seems to be a major focus of criticism. I am perhaps not as surprised or upset by this, because in my experience in trying to get communications established in many areas of rural U.S., I am aware of the many roadblocks that delay this. Many of these same blocks occurred during the project: Problems and errors in ordering; Delays in purchasing and accepting the radios; obtaining frequencies; installing repeaters; etc., etc. I am not certain that even if people were assigned exclusively to radios that the process would have significantly speeded.

It may be helpful for representatives from A.I.D. (D.C.) and H.O.P.E. to review and discuss some of the mutual expectations and/or misunderstandings in this broad area of Program Administration. Lessons learned here may be of significant benefit to any possible future ventures.

In this area I wish to discuss another Program Administration element: Selection and assignment of project people. This was excellent, and all of the staff receive excellent recommendations from hospital staff:

Dr. Van Tyne: "He certainly put his stamp of good influence on this hospital for time to come".

Nurses Ebert and Thompson: "Their efforts were outstanding not only technically and professionally, but also personally in the way they integrated themselves into the staff".

Warren Schaub: "Not only was he an outstanding consultant and teacher, he was truly an ambassador for good will. In addition to this primary mission of developing an EMT cadre, he participated with Fire Department, Police Department and citizens groups for CPR teaching, other teaching efforts, and overall developing a team spirit of togetherness and good will". His 'rescue at sea venture' was appropriately recognized by the U.S. Ambassador. From my observations he indeed entered the hearts of the people.

The above was an unplanned effect of the program, but one which reflects well upon U.S.

V. Impact Upon Beneficiary Population

The ambulance service has been particularly well received. This very visible system of flashing lights and sirens is always popular and is viewed with pride as a sign of progress, in addition to its primary life-saving purpose.

The Emergency Department improvements have similarly benefitted the population: Patients needing urgent care are seen more rapidly; the improved organization, training efforts, and increased staffing appear to have improved the quality and efficiency with which patients are seen. These are less visible to the general public, whose criteria are often: "How quickly am I seen", and "How pleasantly am I treated", and indeed with the present triage system, many less urgent cases have a long time to wait.

VI. Recommendations

1. In future projects, the initial survey should review the program or problems by the standard Essential Components of an EMS System. This will often reveal the need for a comprehensive approach, and will involve the team of Medical Director, Pre-hospital Consultant, and Nursing Consultant early in the project.
- 2.a) Encourage West Indies University and the Nursing School to include Emergency Medicine in their curricula. Attached is the American College of Emergency Physicians recommendations: "Core Content for Undergraduate Education in Emergency Medicine".
- b) As physicians and nurses with special interests and skills in EMS become available, recruit them to Q.E.H.
3. Recognize that an EMS system is dynamic, and requires continuing efforts just to maintain the present level of improvement. This includes:
 - a) On-going training of physicians, nurses, EMTs. A course such as the American College of Surgeons Advanced Trauma Life Support would be very helpful, using a faculty of outside consultants plus Q.E.H. Surgeons.
 - b) Regular meetings of E.R. staff to review, revise, further develop policies, procedures, protocols.
 - c) On-going evaluation: Daily E.R. logs should be periodically reviewed and can give such valuable information as: how long are patients waiting; what percent receive consultation, x-rays, or are admitted; how does the initial triage classification correlate; etc. Similarly, the ambulance runs should be periodically reviewed on a random sampling basis. The E.D. Director should oversee this, but could be assigned to a staff physician.
 - d) Development of ambulance maintenance, repair, and replacement schedule.
4. Meet the needs as outlined in topics of Lab., X-ray, Medical Records. Technical Assistance would be helpful.
5. Prior to the move into the new E.R. Department (scheduled for about 1 1/2 years from now), an intensive effort should be made to assure that services start off with immediate implementation of appropriate policies and procedures, and protocols. The hospital administration and E.R staff recommended that another training session, especially for E.R. nurses, would be helpful. I concur. Nurses Ebert and Thompson did such a fine job that I feel they would be excellent for any further efforts. Mr. Schaub would be very helpful in assuring that the pre-hospital system is integrated with the new department; and a physician consultant would be helpful in that final push to integrate the Emergency Department with in-patient services, with lab x-ray and other support services, and with the polyclinics.

6. It will be helpful to adopt (or adapt) an E.D. Standard to guide in monitoring and evaluation and toward making further improvements. One such guide is the U.S. Joint Commission on Accreditation of Hospitals Standards for Emergency Services. (JCAH Accreditation Manual for Hospitals, 1985, pgs. 17-29).

7. It is important to involve the in-patient clinical services in maintaining quality services in the E.D. A suggested mechanism is to have in-patient consultants give lectures to the E.D. staff such as:

Pediatric Consultant: "Initial management of pediatric emergencies".

Surgical Consultant: "Initial management of surgical emergencies," etc.

Core Content for Undergraduate Education in Emergency Medicine

[Society of Teachers of Emergency Medicine (STEM): Core content for undergraduate education in emergency medicine. Ann Emerg Med May 1985; 14:474-476.]

Society of Teachers of Emergency
Medicine
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INTRODUCTION

The Undergraduate Curriculum Promotions Committee of the Society of Teachers of Emergency Medicine (STEM) developed the following core content knowledge base and skills list for undergraduate education in emergency medicine. No specific recommendation was made as to how the curriculum should be structured to include this material. A draft document was sent to the ACEP Graduate/Undergraduate Education Committee and all emergency medicine residency directors for comments and suggestions. The final document was then formulated and approved by the STEM board of directors.

KNOWLEDGE BASE

- I. Orientation to Emergency Medicine
 - A. Principles of Emergency Care
 1. Recognition of threats to life and limb
 2. Evaluation of the emergency department patient
 - B. Emergency Medical Services
 1. Prehospital care
 2. Model systems/local system
 3. Paramedic, EMT — training and function
 4. Regionalization/categorization of care/trauma centers/disaster planning/triage
- II. Cardiovascular Diseases
 - A. Cardiopulmonary Resuscitation
 1. One- and two-rescuer CPR
 2. Conscious and unconscious victim
 3. Choking victim
 4. Infant CPR
 - B. Advanced Cardiac Life Support
 1. Coordination and priorities in cardiac arrest
 2. Drugs
 3. Treatment of ventricular fibrillation/ventricular tachycardia/asystole/electromechanical dissociation/bradyarrhythmias
 - C. Chest Pain Evaluation
 - D. Recognition of Supraventricular Arrhythmias
 - E. Recognition of Hypertensive Emergencies
- III. Trauma — Recognition and Initial Treatment
 - A. Priorities in Multiple Trauma
 - B. Head and Facial Trauma
 - C. Spinal Trauma
 1. Normal C-spine radiographs

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- E. Cerebral Vascular Accident
 - F. Altered Mental Status
 - XV. Musculoskeletal
 - A. Neurovascular Extremity Examination
 - Recognition of:
 - B. Strains/Sprains/Fractures
 - C. Septic Joint
 - D. Dislocations
 - E. Soft Tissue Injury/Infection

- XVI. Behavioral Emergencies
 - A. Recognition of Acute Psychosis
 - B. Suicidal and Homicidal Evaluation
 - C. Recognition of Behavioral Disorders Caused by Organic Illness
 - D. Performance of Mental Status Examination

SKILLS

- I. Laceration Repair
 - A. Suture Material; Needles, Instruments
 - B. Types of Wounds
 - C. Wound Preparation
 - D. Tetanus Prophylaxis
 - E. Local Anesthesia

- II. Cardiopulmonary Resuscitation
- III. Megacode Training (ACLS)
- IV. Electric Countershock
 - A. Defibrillator Operation
 - B. Indications
- V. Vascular Access
- VI. Airway Control
 - A. Bag-Mask Ventilation
 - B. Intubation
 - C. Cricothyroidotomy
 - D. Esophageal Obturator Airways
- VII. Splinting/Immobilization
- VIII. C-spine Immobilization
- IX. Gastric Lavage
- X. MAST Suit Application
- XI. Superficial Abscesses — Incision/Drainage
- XII. Nasal Packing
- XIII. Pericardiocentesis
- XIV. Needle Thoracostomy
- XV. Thoracostomy Tube Drainage