

DOCUMENT RESUME

ED 186 660

CE 025 060

TITLE Emergency Medical Services System Research Project Abstracts, 1979. NCHSR Research Management Series.

INSTITUTION National Center for Health Services Research (DHEW/PHS), Hyattsville, Md.

REPORT NO DHHS-PHS-80-3271

PUB DATE Sep 79

NOTE 62p.: For a related document see ED 155 358.

EDRS PRICE MF01/PC03 Plus Postage.

DESCRIPTORS Abstracts; Delivery Systems; \*Emergency Programs; Federal Programs; \*Medical Research; Program Development; Program Evaluation; \*Research Projects; Research Reports

IDENTIFIERS \*Emergency Medical Service; Emergency Medical Services Systems Act 1973; \*National Center for Health Services Research; Public Health Service Act; United States

ABSTRACT \*

Abstracts are presented that describe research grants related to Emergency Medical Services (EMS) System's techniques, methods, devices, and delivery; the research effort was supported by the National Center for Health Services Research during fiscal year 1979. Two sections included in the document describe projects funded under section 1205 of the Emergency Medical Services Systems Act of 1973 and projects funded under section 305 of the Public Health Service Act. Abstracts are listed alphabetically by principal investigator. Each abstract provides administrative information including the project title, grantee institution, principal investigator, grant number, project period, authority, and funding level. In addition, the abstracts contain the objective, scope and findings (or expected findings) of each project. (LRA)

\*\*\*\*\*  
 \* Reproductions supplied by EDRS are the best that can be made \*  
 \* from the original document. \*  
 \*\*\*\*\*

ED186660

# NCHSR

RESEARCH MANAGEMENT  
SERIES

**Emergency  
Medical  
Services  
Systems  
Research  
Project  
Abstracts,  
1979**

prepared by  
Division of Extramural Research

September 1979

U.S. DEPARTMENT OF HEALTH,  
EDUCATION & WELFARE  
NATIONAL INSTITUTE OF  
EDUCATION

THIS DOCUMENT HAS BEEN REPRO-  
DUCED EXACTLY AS RECEIVED FROM  
THE PERSON OR ORGANIZATION ORIGIN-  
ATING IT. POINTS OF VIEW OR OPINIONS  
STATED DO NOT NECESSARILY REPRESENT  
OFFICIAL NATIONAL INSTITUTE OF  
EDUCATION POSITION OR POLICY

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Office of Health Research, Statistics, and Technology  
National Center for Health Services Research

DHHS Publication No. (PHS) 80-3271

MAY 27 1980

2

CE 025 060



NATIONAL CENTER FOR HEALTH SERVICES RESEARCH

RESEARCH MANAGEMENT SERIES

The Research Management Series describes programmatic rather than technical aspects of the NCHSR research effort. Information is presented on the NCHSR goals, research objectives, and priorities; in addition, this series contains administrative information on funding, lists of grants and contracts, and special programs. Publications in this series are intended to bring basic information on the NCHSR and its programs to research planners, administrators, and others who are involved with the allocation of research resources.

ABSTRACT

This document is a compilation of abstracts which describes research grants related to Emergency Medical Services Systems' techniques, methods, devices, and delivery, supported by the National Center for Health Services Research (NCHSR) during 1979. These abstracts contain the objective, scope and findings (or expected findings) for each project. Administrative information, such as grantee institution, address and telephone number of the principal investigator, project period, project funding history, etc., is also included.

STAFFING

Office of Health Research, Statistics, and Technology

Ruth S. Hanft, Deputy Assistant Secretary for  
Health Research, Statistics, and Technology

National Center for Health Services Research

Gerald Rosenthal, Ph.D., Director

Robert A. Fordham, Associate Deputy Director

Donald E. Goldstone, M.D., Associate Deputy Director,  
Medical and Scientific Affairs

Division of Extramural Research

Archer C. Copley, Director (Acting)

Lawrence R. Rose, M.D., Chief, Institutional Care/Emergency  
Medical Services/Long-Term Care Cluster

Elinor K. Walker, Project Officer

Marian M. Fane, Public Health Analyst


## FOREWORD

Section 1205 of the Emergency Medical Services (EMS) Systems Act of 1973 (Public Law 93-154) and Amendments in 1976 and 1979 authorize a program of research in "emergency techniques, methods, devices, and delivery." The 1976 Amendments require that reports of studies supported under this authority contain "recommendations and a plan of action for applying the results of the research...to improve the delivery of emergency medical services." The National Center for Health Services Research (NCHSR), located in the Office of Health Research, Statistics, and Technology, is the DHEW organization responsible for administering this applied research effort.

Projects which are directly concerned with improvements in EMS Systems are listed alphabetically by Principal Investigator in the section "EMS RESEARCH PROJECTS," each of these abstracts is identified as "AUTHORITY: 1205." NCHSR also supports, under authority of Section 305 of the Public Health Service Act, a number of other projects which address important health services research questions in emergency medical services settings. Because readers interested in emergency care are likely to be concerned about these other issues as well, abstracts of these related studies are included in this document. They are listed alphabetically in the section "EMS-RELATED RESEARCH PROJECTS," and each is identified as "AUTHORITY: 305." All abstracts describe projects active during Fiscal Year 1979 (October 1, 1978-September 30, 1979).

Additional information as to methods, progress or findings, of any project may be obtained from the Principal Investigator at the address or telephone number provided in each abstract, or from:

National Center for Health Services Research  
Division of Extramural Research  
Attn: EMS, Room 8-27  
3700 East-West Highway.  
Hyattsville, Maryland 20782  
(301) 436-8936

  
Gerald Rosenthal, Ph.D.  
Director

## TABLE OF CONTENTS

	Page
Foreword.....	111
Table of Contents.....	v
 <b>EMS RESEARCH PROJECTS SUPPORTED UNDER AUTHORITY OF SECTION 1205:</b>	
 <b>OUTCOME MEASURE OF A SUBURBAN PARAMEDIC PROGRAM</b>	
Bergner HS 02456.....	3
 <b>HEALTH STATUS OF SURVIVORS FROM CARDIAC ARREST</b>	
Bergner HS 03058.....	4
 <b>TREATING CARDIAC ARRESTS WITH DEFIBRILLATION BY EMTs</b>	
Bergner HS 03215.....	5
 <b>BIAS IN COMPARING OUTCOMES OF BURN UNITS</b>	
Berry HS 03785.....	6
 <b>CLINICAL ALGORITHMS FOR EMT PERFORMANCE ASSESSMENT</b>	
Cayten HS 02418.....	7
 <b>THE EFFECT OF TELEMETRY ON ADVANCED LIFE SUPPORT CARE</b>	
Cayten HS 03555.....	8
 <b>QUANTIFICATION OF INJURY AND CRITICAL ILLNESS</b>	
Champion HS 02559.....	9
 <b>EVALUATION OF EMS BY USE OF A NATIONAL BURN REGISTRY</b>	
Cornell HS 01906.....	10
 <b>COMPUTERIZED PROTOCOLS APPLIED TO EMERGENCY CARE</b>	
Gardner HS 02463.....	11
 <b>A CRITICAL EXAMINATION OF THE ILLINOIS TRAUMA SYSTEM</b>	
Gelfand HS 02118.....	12
 <b>HOSPITAL EMERGENCY SERVICES</b>	
Georgopoulos HS 02538.....	13
 <b>EMS RESEARCH PROGRAM PROJECTS</b>	
Gibson, HS 01907.....	14
 <b>EMS SEVERITY INDEX RESEARCH</b>	
Gustafson HS 02621.....	15
 <b>EMERGENCY MEDICAL SERVICE EFFECTIVENESS RESEARCH</b>	
Gustafson HS 03819.....	16
 <b>CRISIS INTERVENTION FOR EMTs AND NURSES</b>	
Hampton HS 03334.....	17

TABLE OF CONTENTS (cont.)

Page

ASSESSING ALTERNATIVE EMS SYSTEM IMPROVEMENTS  
 Honey HS 03245.....18

A STUDY OF THE IMPACT OF MOBILE CORONARY CARE UNITS  
 Keller HS 03079.....19

MODEL FOR CRITERION-REFERENCED MEDICAL SPECIALTY TEST  
 Maatsch HS 02038.....20

RURAL VOLUNTEER EMERGENCY MEDICAL COORDINATORS  
 Myrick HS 02507.....21

COMPLICATIONS IN PREHOSPITAL CARDIAC RESUSCITATION  
 Nagel HS 02567.....22

EVALUATION OF AN EMS ALGORITHM SYSTEM  
 Podgorny HS 03094.....23

MYOCARDIAL INFARCTION PREDICTION IN EMERGENCY ROOMS  
 Pozen HS 02068.....24

CONFIRMATION PARAMETERS TO ASSESS EMTs' DECISIONS  
 Pozen HS 02102.....25

EFFECTIVENESS OF ADVANCED EMTs VERSUS BASIC EMTs  
 Pozen HS 02536.....26

IMPACT OF EMS SYSTEM DEVELOPMENT IN RURAL AREAS  
 Pozen HS 03826.....27

MEASUREMENT OF EMT PERFORMANCE  
 Sechrest HS 02702.....28

RELIABILITY AND VALIDITY TESTING OF THE AIS AND ISS  
 Shapiro HS 03606.....29

ANALYSIS AND THERAPY OF LIFE-THREATENING EMERGENCIES  
 Shoemaker HS 01833.....30

QUALITY OF CARE IN ACUTE MYOCARDIAL INFARCTION  
 Tugwell HS 03239.....31

A COMPUTERIZED EVALUATION MODEL FOR EMS PERFORMANCE  
 Wolfe HS 02902.....32

COMPUTERIZED PREHOSPITAL SKILL DEPLOYMENT/MAINTENANCE  
 Wolfe HS 03813.....33



TABLE OF CONTENTS (cont.)

Page

EMS-RELATED RESEARCH PROJECTS SUPPORTED UNDER AUTHORITY OF SECTION 305:

SOCIALIZATION: EMS AND OTHER RESIDENCY PROGRAMS  
 Anwar HS 02129.....37

~~AN X-RAY SCREENING PROTOCOL FOR EXTREMITY INJURIES~~  
 Brand HS 03625.....38

A COMPUTER AUDIT TO IMPROVE ER DRUG PRESCRIBING  
 Brand HS 03953.....39

EVALUATION OF EMERGENCY ROOM REFERRAL SYSTEM  
 Charney HS 04005.....40

EVALUATION OF ELEMENTS IN A COMMUNITY-WIDE EMS SYSTEM  
 Cobb HS 01943.....41

VALIDATION OF QUALITY ASSESSMENT MEASURES IN EMS  
 Frazier HS 02149.....42

DIAGNOSIS-BASED PLANNING OF CORONARY CARE UNITS  
 Greenberg HS 03538.....43

ASSESSING EMERGENCY SYSTEMS QUALITY: METHOD DEVELOPMENT  
 Greenfield HS 02467.....44

COST-EFFECTIVE STRATEGIES IN AMBULATORY CARE  
 Komaroff HS 04066.....45

SEVERITY INDEX CONSTRUCTION: METHODS, EMS APPLICATION  
 Krischer HS 03090.....46

EMS RESEARCH CONFERENCE  
 Krome HS 03274.....47

APPLICATIONS OF DECISION THEORY TO THE TRIAGE PROCESS  
 Ledley HS 03626.....48

~~FACTORS DETERMINING OUTCOME OF HOSPITALIZED TRAUMA~~  
 Levy HS 04029.....49

MEASURING THE QUALITY OF SURVIVAL IN BURN PATIENTS  
 Munster HS 03237.....50

BURN CARE FACILITY STUDY  
 Payne HS 03261.....51

COMMUNITY PLANNING FOR EMERGENCY MEDICAL SERVICES  
 Ricci HS 02512.....52

TABLE OF CONTENTS (cont.)

	Page
A GUIDE TO INVESTMENT CRITERIA FOR CRITICAL CARE UNITS Sherman HS 03569.....	53
LOCATIONAL ANALYSIS OF MULTILEVEL EMS SYSTEMS Storbeck HS 03722.....	54
COMPUTER-BASED AMBULATORY QUALITY ASSURANCE PROGRAM Winickoff HS 02142.....	55
EFFICIENT RESOURCE ALLOCATION IN SPECIAL CARE NETWORKS Wong HS 03157.....	56

8



FISCAL YEAR 1979 - ACTIVE EMS RESEARCH PROJECTS: 1205

TITLE: Outcome Measure of a Suburban  
Paramedic Program

GRANT NUMBER:  
1 R18 HS 02456

GRANTEE INSTITUTION: King County Health  
Department

PROJECT PERIOD:  
06/30/76-09/29/79

PRINCIPAL INVESTIGATOR:  
Lawrence Bergner, M.D.  
Director  
Seattle-King County Department  
of Public Health  
1500 Public Health Safety Building  
Seattle, Washington, 98104  
(206) 625-2164

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 76 \$ 88,592  
FY 77 \$ 89,555  
FY 78 \$ 59,024

OBJECTIVE:

To determine whether the addition of a highly/sophisticated and expensive paramedic program in a suburban community can significantly increase the number of people who survive out-of-hospital cardiac arrest.

SCOPE:

Using a before/after design with two control communities, the study compares the number of survivors of cardiac emergencies served by technicians trained to the basic level with those served by advanced emergency medical technicians (paramedics).

FINDINGS:

The study will permit estimates of the effectiveness of paramedic services as compared to less sophisticated rescue services. The cost of training and equipping paramedic teams is much greater than for emergency medical technicians. It is important to establish that the additional costs are warranted. Preliminary findings indicate substantial increases in survival if cardiopulmonary resuscitation can begin within four minutes of collapse and defibrillation by paramedics can follow within a second four-minute interval. Such findings constitute valuable information for EMS planners and administrators at the community level.

TITLE: Health Status of Survivors  
from Cardiac Arrest

GRANT NUMBER:  
5 RO1 HS 03058

GRANTEE INSTITUTION: King County Health  
Department

PROJECT PERIOD:  
09/30/78-03/31/81

PRINCIPAL INVESTIGATOR:  
Lawrence Bergner, M.D.  
Director  
Seattle-King County Department  
of Public Health  
1500 Public Safety Building  
Seattle, Washington 98104  
(206) 625-2164

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 78 \$ 99,650  
FY 79 \$ 75,000  
FY 80 \$ 71,500

OBJECTIVE:

To measure morbidity in patients who survive out-of-hospital cardiac arrest using the Sickness Impact Profile (SIP) to judge the completeness of their recovery.

SCOPE:

Survivors of heart attacks in Seattle and King County are interviewed six months after the incidents to determine their health status. Their SIP scores are compared with those of a group of normal patients and with a group of heart patients who did not suffer an arrest. Comparisons within groups will also be made to identify other factors in treatment which may affect health status.

FINDINGS:

Pilot work has suggested large differences in level of recovery from heart attacks depending upon whether prehospital care is given by basic technicians or by paramedics, and whether resuscitation is begun immediately or is delayed. These factors represent issues central to EMS policy decisions with important cost implications. If it can be determined that it is essential to provide both rapid and sophisticated prehospital care to assure complete recovery from heart attacks, new system designs and techniques will be required particularly for rural areas.

**TITLE:** Treating Cardiac Arrest With  
Defibrillation by EMTs

**GRANT NUMBER:**  
5 R18 HS 02215

**GRANTEE INSTITUTION:** King County Health  
Department

**PROJECT PERIOD:**  
04/01/78-10/31/80

**PRINCIPAL INVESTIGATOR:**  
Lawrence Bergner, M.D.  
Director  
Seattle-King County Department  
of Public Health  
1500 Public Safety Building  
Seattle, Washington 98104  
(206) 625-2164

**AUTHORITY:** 1205/EMS

**FUNDING LEVEL:**  
FY 78 \$ 93,554  
FY 79 \$ 78,586  
FY 80 \$ 52,924

**OBJECTIVE:**

To determine the effectiveness of prompt defibrillation, performed by Emergency Medical Technicians (EMTs), in improving survival rates for out-of-hospital cardiac arrest patients.

**SCOPE:**

This project takes advantage of a natural experiment in King County, Washington, where an Advanced Life Support system is being introduced in phases. A comparison will be possible of the experience of areas served by EMTs, by EMTs trained and certified in the use of defibrillators (EMT/DC), and by paramedics (EMTs extensively trained in advanced cardiac techniques such as intubation and medications, as well as defibrillation). A surveillance system has been established to identify all out-of-hospital cardiac arrest patients who receive emergency care and the outcome (death, hospital admission, long-term survival) is determined for each patient. The effectiveness of EMT/DC services is compared with the results of basic EMT service, and with paramedic results. The value of a tiered system in which EMT/DCs supplement paramedic services is also being examined.

**FINDINGS:**

Preliminary findings suggest that, as compared to conventional EMTs, EMT/DC services double the rate of survival to hospital discharge for cases of cardiac arrest due to primary heart disease; this comes close to the rate achieved by paramedics. If these results are borne out, it will be possible to recommend EMT-performed defibrillation as an alternative or a supplement to the much more costly paramedic program for improving prehospital cardiac care. This system design would particularly aid rural and remote EMS systems containing communities with low population densities and limited budgets.

TITLE: Bias in Comparing-Outcomes of  
Burn Units

GRANT NUMBER:  
1 R03 HS 03785

GRANTEE INSTITUTION: The Regents of the  
University of California

PROJECT PERIOD:  
.09/30/79-09/29/81

PRINCIPAL INVESTIGATOR:  
Charles C. Berry, Ph.D.  
Department of Community Medicine  
University of California, San Diego  
La Jolla, California 92093  
(714) 452-2098

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 79 \$ 15,150  
FY 80 \$ 16,252

OBJECTIVE:

To assess the bias in estimates of severity which are used in comparing the effectiveness of treatments given in different burn units, and to develop less biased methods.

SCOPE:

A mathematical model will be constructed of the process through which the effectiveness of treatment in specialized burn care units is estimated. The model will be used to determine the amount of bias in the estimation of outcomes under reasonable ranges of the model's parameters. This will allow for the development and testing of other, less biased procedures for comparing the care given in such units. One such procedure will involve the development of mathematical methods to correct the small errors in measuring the severity of burn injury, errors of considerable importance in studies which use complex analytic methods to analyze and compare the results of burn treatment in different hospitals.

FINDINGS:

This study will provide methods which will allow less biased estimates of effects of treatments given in different burn units where such units vary in average severity of cases treated. Present mathematical adjustment procedures are biased against those units treating more severely burned patients. This may well account for the failure of other investigators to find a difference in efficacy between treatments in community hospitals and special burn care units. Methods growing out of these investigations can be expected to reduce the bias in many non-experimental evaluations of health services, thereby permitting more accurate assessments of the effectiveness of Federal activities such as regional EMS systems or Burn Centers.

TITLE: Clinical Algorithms for EMT  
Performance Assessment

GRANT NUMBER:  
5 R18 HS 02418

GRANTEE INSTITUTION: Trustees of the University  
of Pennsylvania

PROJECT PERIOD:  
06/30/76-12/31/79

PRINCIPAL INVESTIGATOR:

C. Gene Cayten, M.D., M.P.H.  
Center for the Study of Emergency  
Health Services  
University of Pennsylvania.  
Room 302  
3609 Locust Walk/C9  
Philadelphia, Pennsylvania 19104  
(215) 243-6304

AUTHORITY: 1205/EMS

FUNDING LEVEL:

FY 76 \$249,088  
FY 77 \$227,857  
FY 78 \$123,730

OBJECTIVE:

To develop, implement, and test clinical algorithms as a tool for upgrading the performance of Emergency Medical Technicians (EMTs). A clinical algorithm is a step-by-step guide to treatment, employing branching logic, which embodies the standard of care for a specific condition or illness.

SCOPE:

The initial condition chosen was cardiac emergencies, because of relative ease of measurement, definition, and agreement on care standards. Run reports and on-scene observations were compared with cardiac algorithms to determine the differences between actual EMT performance and the care standard. The algorithm in pocket size is now being tested as a field reference tool. EMTs who have been trained and guided by the algorithms will be compared with controls for tested knowledge of cardiac care. In addition, mortality rates of patients treated by EMTs with algorithms will be compared with those of patients treated without algorithms.

FINDINGS:

The cardiac algorithm is being tested in the field as a method of training EMTs and maintaining their skills at trained levels. Comparison with controls will indicate the effectiveness over time of EMTs using the pocket algorithms versus those trained and supervised in more traditional ways. The algorithm holds promise of serving as an effective and efficient aid to training and performance monitoring of EMTs.

TITLE: The Effect of Telemetry on Advanced  
Life Support Care

GRANT NUMBER:  
1 R18 HS 03555

GRANTEE INSTITUTION: Trustees of the University  
of Pennsylvania

PROJECT PERIOD:  
09/30/79-09/29/82

PRINCIPAL INVESTIGATOR:  
C. Gene Cayten, M.D., M.P.H.  
Center for the Study of Emergency  
Health Services  
University of Pennsylvania  
Room 302  
3609 Locust Walk/C9  
Philadelphia, Pennsylvania 19104  
(215) 243-6304

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 79 \$169,511  
FY 80 \$189,465  
FY 81 \$157,000

OBJECTIVE:

To examine the extent to which telemetry (radio transmission of electrocardiographic signals) improves the chances that a victim of cardiac arrest will survive.

SCOPE:

Philadelphia is an urban community which presently responds to heart attack emergencies with trained personnel equipped with medications and electrical devices to restore heartbeat. The investigators will determine the value of augmenting the present system with procedures which permit a physician to diagnose a transmitted electrocardiogram and monitor resuscitation during transport to a hospital. After rescue personnel have been tested for their ability to recognize abnormal cardiac rhythms, half of the teams (selected randomly) will transmit electrocardiograms as part of their resuscitation procedures and the other half will continue present procedures. Survival rates of patients treated by each group will be compared.

FINDINGS:

Federal guidance holds that an Emergency Medical Services system which provides Advanced Life Support must use telemetry to insure medical control of the steps in cardiac resuscitation. Telemetry is an expensive element, however, and a number of well-established and very effective systems which employ highly trained rescue personnel no longer use their telemetry equipment. If valid information can be produced to show that training really does substitute adequately for telemetry, the findings would be of great importance to Federal policy. Many communities which are unable to afford the equipment and maintenance costs of telemetry would then be better able to establish Advanced Life Support procedures, a result of particular importance in rural and remote areas where the costs per citizen of installing and maintaining sophisticated communications devices are a major concern to system planners.



TITLE: Quantification of Injury and Critical Illness

GRANT NUMBER:  
. 5 R18 HS 02559.

GRANTEE INSTITUTION: Washington Hospital Center

PROJECT PERIOD:  
06/30/76-07/31/80

PRINCIPAL INVESTIGATOR:

Howard R. Champion, M.D.

Director

Surgical Intensive Care and Shock-Trauma Program

Department of Surgery

Washington Hospital Center

110 Irving Street, N.W.

Washington, D.C. 20010

(202) 541-7257

AUTHORITY: 1205/EMS

FUNDING LEVEL:

FY-76 \$151,290

FY-77 \$152,500

FY 78 \$147,529

FY 79 \$ 89,788

OBJECTIVE:

To develop indices of patient status which can be used to evaluate the effectiveness of prehospital care in improving patient outcomes, compare the performance of basic and advanced emergency medical technicians, and prescribe better methods for early resuscitation and stabilization of critical medical emergencies.

SCOPE:

A multi-index predictor of patient status will be developed through various mathematical manipulations of clinical data, tested against patient outcomes, and used as a dynamic, real-time measure of the effectiveness of various methods of treatment. If organizational and training problems can be resolved in a timely manner, the investigators will continue their efforts to test the value of a new Triage Index in permitting adjustments for case mix and comparing (in terms of mortality and other outcome measures) the clinical course of patients treated by EMTs with those treated by paramedics.

FINDINGS:

The evaluation of Emergency Medical Services systems and system components is seriously hampered by difficulties in adjusting for case-mix -- the likelihood that groups of emergency victims are at the same risk of death. Moreover, the effectiveness of various techniques for resuscitating and stabilizing patients is difficult to judge because of the lack of reliable measures of patient status. This project is developing and testing a Triage Index, to compare the results of different methods of providing prehospital care, and a multi-index predictor of patient status to monitor the effectiveness of various treatment regimens.

TITLE: Evaluation of EMS by Use of  
a National Burn Registry

GRANT NUMBER:  
5 R18 HS 01906

GRANTEE INSTITUTION: University of Michigan

PROJECT PERIOD:  
06/30/75-03/31/79

PRINCIPAL INVESTIGATOR:  
Richard G. Cornell, Ph.D.  
Chairman  
Department of Biostatistics  
School of Public Health  
University of Michigan  
109 South Observatory  
Ann Arbor, Michigan 48109  
(313) 764-5450

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 75 \$206,178  
FY 76 \$211,184  
FY 77 \$191,642

OBJECTIVE:

To evaluate the quality and effectiveness of burn care provided in specialized facilities, and to examine factors associated with the significant differences in survival of burn victims cared for in different institutions.

SCOPE:

An improved model for estimating the severity of burn injuries is being tested for use in comparing death rates of burn victims in different hospitals, and in explaining differences between hospitals in duration of hospital stay, frequency and type of complications, and cause of death. Using data compiled through a voluntary registry, the predicted values for burn mortality and morbidity in each hospital are compared with actual results. Detailed descriptions of the organization, staffing, and treatment procedures used in each hospital are analyzed to determine the extent to which they explain the widely varying results when similar patients are treated in hospitals of different capabilities, and even in different specialized burn centers.

FINDINGS:

Burn mortality and morbidity have been found to vary far more than would be expected in different hospitals and in different Burn Centers. These variations cannot be adequately explained by differences in treatment methods (such as use of antibiotics, adequacy of skin grafting procedures, or appropriateness of fluid therapy), nor by differences in hospital organization and staffing. Furthermore, the variations in morbidity and mortality in different institutions are not constant across all levels of burn injury -- some hospitals have better than expected results for severe burns but worse than expected results for less serious injuries. Explanations for such findings are essential ingredients in the current discussions concerning the need for more specialized Burn Centers.

TITLE: Computerized Protocols Applied  
to Emergency Care

GRANT NUMBER:  
5 R18 HS 02463

GRANTEE INSTITUTION: LDS Hospital - Deseret  
Foundation

PROJECT PERIOD:  
06/30/76-06/30/79

PRINCIPAL INVESTIGATOR:  
Reed M. Gardner, Ph.D.  
LDS Hospital/University of Utah  
325 Eighth Avenue  
Salt Lake City, Utah 84143  
(801) 350-1165

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 76 \$131,098  
FY 77 \$101,846

OBJECTIVE:

To expand an existing system of computerized assistance in clinical decision-making to include decisions about appropriate care for patients in the Emergency Department.

SCOPE:

Computerized protocols are being developed and tested to assure that patients in need of specialized care will be sent to the proper inpatient unit and those not needing hospital care will be referred to the appropriate source of outpatient care. The system provides an "alert" system for emergency conditions that may develop suddenly in hospitalized patients, requiring intensive care.

FINDINGS:

The clinical decision-making process is a highly complex and difficult one for physicians, requiring timely and correct assessment of a wide array of patient data. The computerized system increases the ability of the clinician to organize and integrate these data and thereby assure that the patient receives all the care required for the best possible outcome, so that hospital bills, personnel, and other costly resources are not squandered.

TITLE: A Critical Examination of the  
Illinois Trauma System

GRANT NUMBER:  
5 R01 HS 02118

GRANTEE-INSTITUTION: University of Illinois

PROJECT PERIOD:  
06/30/76-12/31/79

PRINCIPAL INVESTIGATOR:  
Henry M. Gelfand, M.D.  
School of Public Health  
University of Illinois at the  
Medical Center  
P.O. Box 6998  
Chicago, Illinois 60680  
(312) 996-8860

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 76 \$153,498  
FY 77 \$ 93,602

OBJECTIVE:

To evaluate the effectiveness of the Trauma Center Program (50 hospitals designated as Trauma Centers) in the State of Illinois.

SCOPE:

Completeness, reliability, and validity of Trauma Registry data are being assessed. The project is identifying the percentage of trauma patients treated at non-Center hospitals as compared with designated Trauma Centers. Comparisons are being made of the two sets of patients with regard to medical status, disability, duration of hospitalization, satisfaction, and cost. Data collection activities include surveys, data validation tasks, and case studies.

FINDINGS:

If expected improvements in emergency care can be documented through an existing Trauma Registry, the effectiveness and efficiency of Trauma Centers can be established, and the concept can safely be implemented in other states to improve emergency medical services.

TITLE: Hospital Emergency Services

GRANT NUMBER:  
3 ROI HS 02538

GRANTEE INSTITUTION: Regents of the University  
of Michigan

PROJECT PERIOD:  
06/30/76-08/31/80

PRINCIPAL INVESTIGATOR:  
Basil S. Georgopoulos, Ph.D.  
Research Scientist and Program Director  
The Institute for Social Research  
The University of Michigan  
426 Thompson  
Ann Arbor, Michigan 48106  
(313) 764-8394

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 76 \$123,290  
FY 77 \$225,498  
FY 78 \$157,920  
FY 79 \$ 97,733

OBJECTIVE:

To describe the organization and assess the effectiveness of emergency care units.

SCOPE:

This comparative study of a carefully-drawn sample of 30 hospital emergency services is examining their efficiency, quality of service, responsiveness to community expectations, and staff and patient satisfaction. These variables are being related to characteristics of their organization and management. Data are being collected by interviews with administrators, physicians, nurses, community representatives and patients; records are examined to corroborate or supplement interview data.

FINDINGS:

This study is examining the relationships between the organization and operation of an Emergency Department and the effectiveness of such units. Information about these relationships is needed not only for health planning activities but for immediate decisions which face hospital administrators daily--for example, the rapid proliferation of contract organizations which operate emergency facilities as a "franchise" may have important effects on both efficiency and effectiveness.

TITLE: EMS Research Program Projects

GRANT NUMBER:  
5 PO1 HS 01907

GRANTEE INSTITUTION: The Johns Hopkins University

PROJECT PERIOD:  
06/30/75-06/29/79

PRINCIPAL INVESTIGATOR:  
Geoffrey Gibson, Ph.D.  
Health Services Research and  
Development Center  
Johns Hopkins Medical Institutions  
624 N. Broadway  
Baltimore, Maryland 21205  
(301) 955-6498

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 75 \$441,616  
FY 76 \$524,137  
FY 77 \$398,853  
FY 78 \$315,256

OBJECTIVE:

To develop valid measures for determining the impact of changes in the organization of Emergency Medical Services systems and in the management of patients in Emergency Departments.

SCOPE:

EMS systems are expected to classify (categorize) their hospital resources in order to improve the match between the patient's need for emergency care and the capabilities of the hospital designated to provide that care. This study is developing reliable methods to describe and classify Emergency Departments in terms of the types and severity of diseases treated there and the personnel and equipment they need. The project is also evaluating the effectiveness of categorization in changing hospital utilization patterns, and is developing methods to assess and improve the quality of care provided in Emergency Departments.

FINDINGS:

Standards for the resources required to manage the various kinds of critical emergency victims have been produced through expert consensus, and have been validated by comparing them with hospital records of resources actually used in providing emergency care and with information about clinical outcomes. Data about patients who use emergency services "inappropriately," and their reasons for doing so, have also been analyzed. Methods have been developed and tested to improve the ability of Emergency Departments to provide appropriate screening, prevention, and educational services, and to insure continuity of care. Findings of this study are important in helping communities provide efficient and effective emergency services after Federal subsidies have been withdrawn.



TITLE: EMS Severity Index Research

GRANT NUMBER:

5 R18 HS 02621

GRANTEE INSTITUTION: University of Wisconsin

PROJECT PERIOD:

07/01/77-03/31/80

PRINCIPAL INVESTIGATOR:

David H. Gustafson, Ph.D.

Professor and Director

Center for Health Systems Research

and Analysis (CHSRA)

University of Wisconsin

1225 Observatory Drive

Madison, Wisconsin 53706

(608) 263-4883

AUTHORITY: 1205/EMS

FUNDING LEVEL:

FY 77 \$177,864

FY 78 \$222,325

OBJECTIVE:

To develop and test a useful and practical method for constructing a severity index for use in emergency medical services. Using the techniques of decision theory, and the multidimensional scaling methods of multi-attribute utility theory, information from panels of experts is being gathered, organized, and applied to the development of an index for victims of multiple trauma and of ischemic heart disease.

SCOPE:

Panels of physicians have been assembled; their selection has been systematically varied to include EMS physicians, specialists and a mixture of both. This has been done for two diseases, cardiac emergencies and multiple trauma. The first condition was presented to three panels in Wisconsin, one in Ohio, one in Michigan and one in Maine. The elements these experts used to determine the seriousness of medical emergencies were identified and the methods of decision theory and utility theory were used to assign weights to these elements and to arrange them in the form of indexes. A high degree of agreement on the weighted elements in the cardiac index was found and a similar approach was therefore used to classify patients with multiple trauma. The predictive value of these indexes, derived from expert opinion, will be explored using actual clinical data from hospitals in several localities.

FINDINGS:

Indexes obtained from different mixes of experts in different sites have shown considerable agreement about the clinical factors which determine the severity of cardiac and trauma emergencies. When these indexes are used to classify patients in various hospitals, considerable differences in treatments and in outcomes appeared. If validated through further testing, these indexes will be used to classify patients for determination of the effectiveness of organized emergency medical services and for more rational allocation of medical resources.



TITLE: Emergency Medical Service  
Effectiveness Research

GRANT NUMBER:  
1 RO1 HS 03819

GRANTEE INSTITUTION: University of Wisconsin

PROJECT PERIOD:  
09/15/79-09/14/82

PRINCIPAL INVESTIGATOR:  
David Gustafson, Ph.D.  
Professor and Director  
Center for Health Systems Research  
and Analysis (CHSRA)  
University of Wisconsin  
1225 Observatory Drive  
Madison, Wisconsin 53706  
(608) 263-4883

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 79 \$418,902  
FY 80 \$512,216  
FY 81 \$487,000

OBJECTIVE:

To measure and explain the effect of categorizing hospitals on clinical outcome and to describe and evaluate the effectiveness of current transfer practices in emergency care.

SCOPE:

This research will examine hospital record abstracts for 20,000 cases. Hospitals to be studied will represent three levels of categorization, and three sites, as follows: 20 hospitals from Maine (where categorization is integrated into an advanced EMS system), 15 from Green Bay, Wisconsin (where a categorization system has recently been introduced), and 15 from Madison, Wisconsin (where no formal categorization exists as yet). Severity indices developed at the University of Wisconsin will be used to classify patients into comparable groups. Multivariate analysis will estimate the extent to which the categorization efforts have improved patient outcomes and actual transfer practice. Site visits, record reviews and epidemiological analyses will be used to help explain results.

FINDINGS:

The requirements for categorization are a central focus of Federal EMS program efforts, but they have met with considerable resistance from professional groups and from hospitals. The question of whether categorization provides measurable benefits to emergency patients, or permits more effective and efficient system operation, is of paramount interest to both DHEW and the Congress.

TITLE: Crisis Intervention for EMTs  
and Nurses

GRANT NUMBER:  
1 R18 HS 03334

GRANTEE INSTITUTION: University of Georgia

PROJECT PERIOD:  
07/01/79-06/30/80

PRINCIPAL INVESTIGATOR:  
Leonard A. Hampton, Ed.D.  
Georgia Center for Continuing Education  
Program Evaluation and Special Projects  
Room 121  
Athens, Georgia 30602  
(404) 542-3064

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 79 \$ 50,155

OBJECTIVE:

To develop, implement and evaluate a comprehensive program for training Emergency Medical Technicians and Emergency Nurses to understand the psychosocial needs of patients undergoing behavioral emergencies.

SCOPE:

The training program covers a sixty-four hour period. A model of crisis-formation is employed to guide the program which is delivered in two 16-hour sessions separated by a two-week break. There will be a thirty-two-hour follow-through period wherein instructors will continue training by meeting with trainees one day each month for the remaining four months of the program. Teaching techniques will include lecture, discussion, role play, problem-solving, questionnaires and audio-visual presentations. The evaluation employs a control group design with random assignment to early and delayed educational intervention. Assessment of the training program includes changes in EMT and RN communication skills, attitudes and knowledge, as well as assessments of improvements in patient status and ability to cope with stressful situations.

FINDINGS:

EMTs and Emergency Nurses will learn to understand the underlying motivations of behavior and the basic principles of psychological intervention which should result in more efficient and appropriate management of crisis situations, increase overall on-the-job effectiveness and job satisfaction, and reduce inappropriate use of transportation and hospitalization. A brief, effective training program should be valuable for all ER and EMT personnel and for many others who must deal with disturbed persons. This study is an important step towards improving the ability of EMS systems to manage the difficult category of behavioral emergencies, one of the targets of the Federal EMS program.

TITLE: Assessing Alternative EMS  
System Improvements

GRANT NUMBER:  
1 R21 HS 03245

GRANTEE INSTITUTION: University of Iowa

PROJECT PERIOD:  
09/01/78-12/31/79

PRINCIPAL INVESTIGATOR:  
Rex D. Honey, Ph.D.  
Assistant Professor  
Department of Geography  
University of Iowa  
Iowa City, Iowa 52242  
(319) 353-3131

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 78 \$ 37,582

OBJECTIVE:

To determine the availability of data on distribution of EMS resources, to judge the value of those data to explain inequities and deficiencies in the current distribution of resources, and to construct a mathematical model for planning and evaluating alternative strategies to improve the distribution of EMS resources.

SCOPE:

By using a location-allocation algorithm together with a geographic information system existing data for a 23-county EMS region (Southeast Iowa EMS) are being collected and analyzed to determine whether these data support the impression that EMS resources are being distributed inequitably and inefficiently. The feasibility of designing and testing a mathematical model to improve decisions about allocating resources is being determined.

FINDINGS:

Results will lead toward more rational resource allocation decisions regarding the 15 system components mandated in the EMS Act and Amendments, decisions of particular concern in rural and remote EMS systems. The project has important implications for health planning regulations as well.

TITLE: A Study of the Impact of Mobile  
Coronary Care Units

GRANT NUMBER:  
5 RO1 HS 02079

GRANTEE INSTITUTION: Ohio State University

PROJECT PERIOD:  
01/01/76-10/31/78

PRINCIPAL INVESTIGATOR:  
Martin D. Keller, M.D., Ph.D.  
Department of Preventive Medicine  
The Ohio State University  
410 West 10th Avenue  
Columbus, Ohio 43210  
(614) 422-5625

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 76 \$165,400  
FY 77 \$165,715

OBJECTIVE:

To determine the extent to which Mobile Coronary Care Units (MCCU's) can improve the outcomes of patients with acute myocardial infarction, and to develop methods for evaluating such services elsewhere.

SCOPE:

~~Victims of acute myocardial infarction (AMI) who used MCCU's~~ were compared with those who arrived at the hospital via other means. Emphasis was placed upon characteristics of the users of the medic units as compared with the nonusers, and on those factors that seemed to lead them to decide to call upon this mode of coronary care. A particular focus was the extent and nature of delays between the onset of their symptoms and their decision to seek help. AMI victims and/or their families were interviewed after clearance by the attending physicians; hospital records were obtained, as were ambulance run records. Follow-up was conducted to determine the status of survivors six months after discharge.

FINDINGS:

Results of the outcome study were ambiguous, due to design problems and analysis oversights. Nonusers and users were drawn from different populations and cannot be compared or contrasted conclusively. The study setting has a longstanding, well funded and highly sophisticated MCCU system; "saturation" has been reached, in that the MCCU system was called for nearly all cases of AMI and was able to respond. The evaluative methods are useful for other communities interested in determining the extent to which their own pre-hospital coronary care system is meeting their needs, and whether unmet needs are caused by a lack of public awareness or an inadequate number of MCCU's. The lifesaving potential of Advanced Life Support Systems and their considerable costs, suggest that decisions about establishing and expanding these systems are of great consequence to health planners, and establish the importance of this sound evaluative method.

TITLE: Model for Criterion-Referenced.  
Medical Specialty Test

GRANT NUMBER:  
1 R18 HS 02038

GRANTEE INSTITUTION: Michigan State University

PROJECT PERIOD:  
07/01/77-06/30/80

PRINCIPAL INVESTIGATOR:  
Jack L. Maatsch, Ph.D.  
Office of Medical Education  
Research and Development  
Michigan State University  
East Lansing, Michigan 48824  
(517) 353-2037

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 77 \$169,117  
FY 78 \$143,709

OBJECTIVE:

To design a set of procedures to develop, score and interpret a certifying examination for physicians entering the newly emerging specialty of Emergency Medicine.

SCOPE:

The test will be criterion-referenced, meaning that it requires a minimum level of performance on a number of key dimensions, rather than simply an overall "passing" score. A field test was carried out to eliminate confusing questions and evaluate various testing formats and administrative procedures. Subjects were thirty-six randomly selected practicing emergency physicians (nearly half of them Emergency Medicine residency graduates), thirty-six randomly-selected second year Emergency Medicine residents and 22 medical students. Data from this field test have been analyzed in preparation for a full-scale research effort, which will focus on approximately 200 candidates for specialty certification in early 1980.

FINDINGS:

The Criterion-Referenced Test strategy employed in the examination is thought to be a superior method of testing for medical competence; its use of Emergency Medicine board candidates will test this hypothesis.

TITLE: Rural Volunteer Emergency  
Medical Coordinators

GRANT NUMBER:  
5 R18 HS 02507

GRANTEE INSTITUTION: Georgia Institute of  
Technology,

PROJECT PERIOD:  
09/01/77-08/31/80

PRINCIPAL INVESTIGATOR:  
Justin A. Myrick, Ph.D.  
Health Systems Research Center  
Georgia Institute of Technology  
225 North Avenue, N.W.  
Atlanta, Georgia 30332  
(404) 894-4551

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 77 \$221,364  
FY 78 \$145,556  
FY 79 \$161,176

OBJECTIVE:

To demonstrate and evaluate the use of trained volunteer Emergency Medical Coordinators (EMCs) in 36 rural Georgia communities with populations under 2,000.

SCOPE:

Rural communities distant from emergency medical care, have been selected. Volunteer EMC's have been selected and trained, and are serving in the communities as first responders, coordinators of the ambulance response system, and health educators. They stabilize victims of emergencies until the formal system can respond, distribute information on how to contact emergency aid, and conduct educational activities to improve the ability of people to recognize medical emergencies and avoid accidents and other conditions that contribute to them. Data are being collected on the characteristics of the communities and the EMCs, the activities of the EMCs and the emergency incidents encountered, and the effect of the EMC upon community awareness and attitudes.

FINDINGS:

Preliminary findings suggest that the EMC program has had an effect upon knowledge of community residents of how to contact the Emergency Medical Services system. A total of 238 calls have been reported by EMCs; of these, 81 in which the EMC responded involved eventual transport by ambulance. Analysis of this group suggests that the EMC is able to respond within an average of less than four minutes, or 1.27 minutes plus one minute per mile of distance. This response level is of great potential value to rural communities, where time required for response by the official system can often be lengthy. In the coming grant year, additional incident data will be collected and questions of adaptability to other communities will be addressed.



TITLE: Complications in Prehospital  
Cardiac Resuscitation

GRANT NUMBER:  
5 R01 HS 02567

GRANTEE INSTITUTION: The Johns Hopkins University

PROJECT PERIOD:  
09/01/77-09/31/80

PRINCIPAL INVESTIGATOR:

Eugene L. Nagel, M.D.  
Johns Hopkins Hospital, Blalock 618  
601 North Broadway  
Baltimore, Maryland 21205  
(301) 955-5606

AUTHORITY: 1205/EMS

FUNDING LEVEL:

FY 77 \$199,591  
FY 78 \$200,566  
FY 79 \$158,058

OBJECTIVE:

To identify complications of prehospital administration of cardiopulmonary resuscitation (CPR) and observe associated factors.

SCOPE:

With the cooperation of the Miami EMS system and medical examiner, out-of-hospital incidents of CPR administration are identified. Medical examination of nonsurvivors, and hospital records and interviews of survivors, are used to identify adverse consequences of the intervention and characteristics of the victim (e.g., age, body weight). Ambulance records and rescuer interviews are used to determine relevant circumstances of the incident and characteristics of the rescuer.

FINDINGS:

Preliminary results suggest high frequencies of fractured ribs and aspiration pneumonitis, but so far show no evidence, as had been anticipated, of differences in injuries between survivors and nonsurvivors which might serve as measures of overall adequacy of CPR performance in an EMS system. Other indications will be sought of ways to improve the technic itself or the training of rescuers in its use.



TITLE: Evaluation of an EMS Algorithm System

GRANT NUMBER:  
3 R18 HS 03094

GRANTEE INSTITUTION: American College of  
Emergency Physicians

PROJECT PERIOD:  
07/01/78-12/31/79

PRINCIPAL INVESTIGATOR:  
George Podgorny, M.D.  
American College of Emergency  
Physicians  
2115 Georgia Avenue  
Winston-Salem, North Carolina 27104  
(919) 727-1161

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 78 \$ 25,134  
FY 79 \$ 3,834

OBJECTIVE:

To evaluate and field test a set of diagnostic and treatment protocols and algorithms applicable to emergency medical care; to test a method of evaluating protocols and algorithms in terms of their medical logic and functional feasibility; and, to derive some general rules for protocol and algorithm design, development, and use.

SCOPE:

A great many algorithms from a variety of sources have been assembled and screened initially for relevance to emergency care by a panel of Emergency Physicians from the American College of Emergency Physicians. Algorithms not relevant, and those deemed both relevant and immediately acceptable in all respects, have been identified. Of the remaining algorithms, those with questionable medical content are being subjected to further review and comments. Those with acceptable medical content are being field tested for acceptability in hospitals with Emergency Medicine residency programs and busy clinical services.

FINDINGS:

Findings from this study will contribute substantially to the development of nationally recognized standards of emergency medical care. The study will also establish guidelines for those desiring to develop emergency care algorithms and, more importantly, it will outline a feasible method of testing the medical validity and the practical utility of these algorithms as tools for training, quality assessment efforts, and staffing plans.

TITLE: Myocardial Infarction Prediction  
in Emergency Rooms

GRANT NUMBER  
5 RO1 HS 02068

GRANTEE INSTITUTION: Trustees of Health and  
Hospitals of the City of  
Boston, Inc.

PROJECT PERIOD:  
06/30/76-06/30/81.

AUTHORITY: 1205/EMS

PRINCIPAL INVESTIGATOR:  
Michael W. Pozen, M.D.; Sc.D.  
Boston City Hospital  
Sears 108  
818 Harrison Avenue  
Boston, Massachusetts 02118  
(617) 424-5108

FUNDING LEVEL:  
FY 76 \$145,770  
FY 77 \$162,039  
FY 78 \$434,559  
FY 79 \$654,470  
FY 80 \$248,384

OBJECTIVE:

To test the utility and reproducibility of a mathematical model in predicting the true occurrence of acute myocardial infarction (AMI) among patients suspected of AMI, and to test its value in reducing inappropriate admissions to coronary care units.

SCOPE:

The predictive model is based on a analysis of clinical, historical, social, and demographic characteristics of 1,781 patients seen in the Boston City Hospital Emergency Room. Transportability of the model is now being studied in six New England hospitals on approximately 4,000 patients. Admission decisions made by physicians using the model will be compared with decisions made without the model to determine the effect upon inappropriate admissions and risk of failing to admit when AMI goes undetected.

FINDINGS:

The model was found to be successful in reducing the false positive admission rate by 33% at the Boston City Hospital. If the model proves as powerful and useful in other settings where it is being tested, it will be of great value in reducing the number of inappropriate admissions to coronary care units without undue risk of incorrect failure to admit. This will make a significant contribution toward cost containment in hospitals across the country, since the cost of care in a coronary care unit is much higher than that in a general inpatient unit.

TITLE: Confirmation Parameters to  
Assess EMTs' Decisions

GRANT NUMBER  
5 RO1 HS 02102

GRANTEE INSTITUTION: Trustees of Health and  
Hospitals of the City of  
Boston, Inc.

PROJECT PERIOD  
07/01/77-02/28/80

AUTHORITY: 1205/EMS

PRINCIPAL INVESTIGATOR:  
Michael W. Pozen, M.D., Sc.D.  
Boston City Hospital  
Sears 108  
818 Harrison Avenue  
Boston, Massachusetts 02118  
(617) 424-5108

FUNDING LEVEL:  
FY 77 \$114,449  
FY 78 \$119,021  
FY 79 \$ 22,118

OBJECTIVE:

To develop methods to assess the quality of care rendered by 81-hour trained Emergency Medical Technicians (EMTs) to patients prior to their arrival in the Emergency Room (ER).

SCOPE:

The method focuses on the development of intermediate outcome measures called "proximal confirmation parameters." These are diagnostic and/or physiological measurements obtained in the ER by which the level of EMT prehospital care will be judged. Proximal confirmation parameters were developed for four specific conditions for which EMT interventions exist, in ascending order of methodological complexity: peripheral fractures, cardiac arrests, chest and abdominal fractures and suspected myocardial infarction.

FINDINGS:

Both negative and positive results have been noted in this methodological exploration. To date findings indicate: 1) only a small percentage of trauma patients who received intravenous therapy actually required it, and 2) a high percentage of patients receiving cardiopulmonary resuscitation show deranged blood-gases, raising questions as to adequate CRR performance. The continued development of a set of parameters measured soon after a patient's arrival in the emergency room will enable assessment of EMTs' and paramedics' decisions, techniques and treatments. These parameters will provide better measures than survival rates of how well these EMT interventions are performed.

TITLE: Effectiveness of Advanced EMTs  
Versus Basic EMTs

GRANT NUMBER:  
5 ROI HS 02536

GRANTEE INSTITUTION: Trustees of Boston  
University

PROJECT PERIOD:  
07/01/77-02/28/80

PRINCIPAL INVESTIGATOR:  
Michael W. Pozen, M.D., Sc.D.  
Boston City Hospital  
Sears 108  
818 Harrison Avenue  
Boston, Massachusetts 02118  
(617) 424-5108

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 77 \$ 91,992  
FY 78 \$107,468  
FY 79 \$ 61,865

OBJECTIVE:

To study the relative effectiveness of 300-hour trained Paramedics versus 81-hour trained basic Emergency Medical Technicians in the delivery of prehospital care to suspected cardiac patients in a rural area.

SCOPE:

The study specifically seeks to measure EMT and Paramedic performance by the following process and outcome variables: condition/symptom recognition, correct treatment, and mortality rates. An EMT/Paramedic experience index is being constructed, and adherence to protocols is being examined. Differences are being examined in rates of condition recognition among both groups by geographic location, clinical experience and patient characteristics. Seasonal differences are also being examined since the rural setting is also a summer resort with a large summertime tourist population.

FINDINGS:

Preliminary findings indicate that paramedics have a significantly higher correct diagnosis rate than EMTs, but increased experience may not be related to improved diagnostic ability. The results from this study will address the question of how much and what kind of additional training is necessary to achieve quality prehospital services. The major area of impact will be on budget, staffing and training decisions for EMS systems.

TITLE: Impact of EMS System Development  
in Rural Areas

GRANT NUMBER:  
1 R18 HS 03826

GRANTEE INSTITUTION: Trustees of Health and  
Hospitals of the City of  
Boston, Inc.

PROJECT PERIOD:  
09/30/79-09/29/83

AUTHORITY: 1205/EMS

PRINCIPAL INVESTIGATOR:  
Michael W. Pozen, M.D., Sc.D.  
Boston City Hospital  
Sears 108  
818 Harrison Avenue  
Boston, Massachusetts 02118  
(617) 424-5108

FUNDING LEVEL:  
FY 79 \$301,053  
FY 80 \$531,622  
FY 81 \$566,000

OBJECTIVE:

To determine the effectiveness of rural EMS systems at various levels of development.

SCOPE:

The processes and outcomes of emergency cardiac care in three rural EMS systems differing in their level of sophistication will be determined. The systems to be compared, representing increasing levels of system development, are a Basic Life Support system in western Massachusetts, a system in West Virginia in transition to paramedic-staffed Advanced Life Support, and a fully-implemented Advanced Life Support system in Cape Cod, Massachusetts, representing increased levels of system development. They will be compared, at three points in time, for appropriateness of use of the ambulance system by patients, EMT and paramedic diagnostic accuracy and adherence to care protocols, and patient mortality in cardiac emergencies.

FINDINGS:

This study will provide information about the care of heart attack-victims in rural areas, the effectiveness of regional EMS systems in improving cardiac care, and the contributions each element of the system makes in lowering mortality. Because rural areas are characterized by longer response time, fewer calls per technician (and therefore less field experience), and higher costs per run, it is important to understand the extent to which the mandates of the Federal EMS program, designed primarily for high population density areas, can be expected to improve cardiac care in rural settings.

**TITLE:** Measurement of EMT Performance

**GRANT NUMBER:**

3-RO1 HS 02702

**GRANTEE INSTITUTION:** Florida State University

**PROJECT PERIOD:**

07/01/77-12/31/79

**PRINCIPAL INVESTIGATOR:**

Lee Sechrest, Ph.D.

Department of Psychology

Florida State University

Tallahassee, Florida 32306

(904) 644-2741

**AUTHORITY:** 1205/EMS

**FUNDING LEVEL:**

FY 77 \$166,292

FY 78 \$160,498

FY 79 \$ 6,877

**OBJECTIVE:**

To develop a method for assessing the performance of emergency medical technicians (EMTs) and paramedics.

**SCOPE:**

Specially trained observers have accompanied ambulance runs to collect data on the decisions and treatments of emergency medical technicians and paramedics in urban and rural areas in a single EMS system. A series of proficiency tests are also being used to evaluate the general level of EMT and paramedic performance. The validity of the performance assessment will be evaluated by comparison with self-reports and with other accepted proficiency tests. Observers are guided by instruments designed to maximize the completeness and objectivity of the data, and simulated emergency incidents have been used to test the reliability and validity of their observations.

**FINDINGS:**

The assessment of performance of these technicians will provide some indicator of what training they need, what types of individuals should be trained, what degree of experience is critical for a defined level of care, and what quality assurance mechanisms are required. Preliminary analysis has shown the power of the method to detect performance deficiencies as compared with routine performance monitoring methods. In order to examine the extent of this information gain, which could be enormously important to system managers, plans are being made to repeat the study in several "mature" systems.



TITLE: Reliability and Validity Testing  
of the AIS and ISS

GRANT NUMBER:  
1 R18 HS 03606

GRANTEE INSTITUTION: The Johns Hopkins  
University

PROJECT PERIOD:  
09/30/79-03/31/80

PRINCIPAL INVESTIGATOR:

Sam Shapiro  
Director  
Health Services Research and  
Development Center  
Johns Hopkins Medical Institutions  
624 North Broadway,  
Baltimore, Maryland 21205  
(301) 955-6562

AUTHORITY: 1205/EMS

FUNDING LEVEL:

FY 79 \$124,252  
FY 80 \$ 75,000

OBJECTIVE:

To test the reliability and validity of the Abbreviated Injury Scale (AIS) and the Injury Severity Scale (ISS) which are being used to classify patients in terms of the severity of their injuries.

SCOPE:

The AIS was developed by expert consensus to examine aspects of automobile safety, while ISS is intended to account for multiple injuries and is a mathematical transformation of AIS scores. Neither has been shown to be applicable to non-vehicular injuries, nor evaluated in terms of the information source used to calculate the score, the level of training of the abstractor, or the agreement between scale values and clinical judgments. This study will determine the reliability of scores calculated by physicians, nurses, and emergency medical technicians. It will explore differences when scores are calculated from Emergency Department forms, hospital charts, or discharge diagnoses, and when records from different hospitals are used. It will also assess whether scores calculated for non-vehicular injuries are as reliable as for vehicular injuries. Agreement between scores and other methods of assessing severity (probability of survival, length of hospital stay, number of operations, and subjective judgments of clinical experts) will also be determined.

FINDINGS:

To compare and evaluate the effectiveness of Emergency Medical Services systems and components in improving the care of injured patients, it is essential that adequate methods be provided to account for differences in the severity of the injury and the probability of dying. This study will estimate the limits of reliability of the two scales most commonly used for this purpose, and will thereby permit credible evaluations of these Federal activities in Emergency Medical Services which are intended to improve the care of trauma victims and the needs, if any, for continued effort.



TITLE: Analysis and Therapy of  
Life-Threatening Emergencies

GRANT NUMBER:  
5 R18 HS 01833

GRANTEE INSTITUTION: Professional Staff Association of Los Angeles County Harbor-UCLA Medical Center

PROJECT PERIOD:  
06/30/76-06/29/81

AUTHORITY: 1205/EMS

PRINCIPAL INVESTIGATOR:  
William C. Shoemaker, M.D.  
Chief, Acute Care Center  
Harbor General Hospital  
1000 West Carson Street  
Torrance, California 90509  
(213) 533-2704

FUNDING LEVEL:  
FY 76 \$100,085  
FY 77 \$ 91,091  
FY 78 \$160,543  
FY 79 \$161,768  
FY 80 \$188,840

OBJECTIVE:

To continue the development and evaluation of a set of protocols to manage severe medical emergencies, and to test the protocols through controlled clinical trials.

SCOPE:

The investigators have designed a general algorithm to be used with patients who arrive at an Emergency Department with potentially life-threatening problems. They are testing the algorithm in one of three emergency services, the other two serving as comparison groups, and are examining differences in mortality, resuscitation time, admission and number of days in the Intensive Care Unit, need for ventilatory support, number of secondary operations and of complications, febrile days, and time in hospital. Further studies include formulation and testing of an algorithm for Intensive Care Units, and completion of the clinical trials in an operational setting, as well as refinement and validation of a Predictive Index to estimate survival probabilities.

FINDINGS:

Early evaluation of the general algorithm suggests a significant improvement in survival for patients treated in accordance with the algorithm, as well as a decrease in time to resuscitation. The systematic development and validation of clear and precise methods for diagnosing and managing critical medical emergencies is a central activity in emergency medical services research, not only because of the significant improvements which effective algorithms can provide in clinical care but also for their value as tools for education, evaluation, and cost analysis.

TITLE: Quality of Care in Acute  
Myocardial Infarction

GRANT NUMBER:  
1 R01 HS 03239

GRANTEE INSTITUTION: McMaster University  
Medical Centre

PROJECT PERIOD:  
02/01/79-01/31/82

PRINCIPAL INVESTIGATOR:

Peter Tugwell, M.D.  
Chairman  
Department of Clinical Epidemiology  
and Biostatistics  
McMaster University  
1200 Main Street West  
Hamilton, Ontario L8S 4J9  
(416) 525-9140

AUTHORITY: 1205/EMS

FUNDING LEVEL:

FY 79 \$121,661  
FY 80 \$104,919  
FY 81 \$102,960

OBJECTIVE:

To develop methods and a strategy for validating the medical care process in myocardial infarction against both clinical and functional health outcomes.

SCOPE:

This prospective analytic survey will follow patients with acute myocardial infarction (rigorously defined) during the course of their care and for six months following discharge. Data on eight attributes of the care process will be gathered from the medical record and from staged interviews of the patient, the physician, and the family, validated against direct observation of a subsample of patient-M.D. encounters. Pretest interviews will be conducted to eliminate bias in the questionnaires, such as memory decay and reactivity. Outcomes will include not only survival, but occupational regimen, aspects of health behavior and clinical conditions such as angina and hypertension.

FINDINGS:

The project will identify those processes of cardiac care which are sufficiently associated with clinical outcomes to warrant controlled clinical trials in later studies. It will thus demonstrate a general strategy for distinguishing elements of the care process suitable for controlled trials from those which are not. Of specific importance to EMS research is the methodologic work, which will produce efficient tools for gathering valid data on the care process, one of the most difficult problems in EMS research. These tools will also improve our ability to measure and control variables of the in-hospital and post-hospital sequences of cardiac care. As a result, we would be able to measure the effect of the EMS system upon ultimate survival and degree of recovery. Such research is now hampered by inability to control for variations in the care after the emergency phase.

TITLE: A Computerized Evaluation Model  
for EMS Performance

GRANT NUMBER:  
5 R18 HS 02902

GRANTEE INSTITUTION: University of Pittsburgh

PROJECT PERIOD:  
09/01/77-12/31/79

PRINCIPAL INVESTIGATOR:  
Harvey Wolfe, Ph.D.  
Department of Industrial Engineering  
University of Pittsburgh  
Room 1043, Benedum Hall  
Pittsburgh, Pennsylvania 15261  
(412) 624-5430

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 77 \$255,000  
FY 78 \$270,000

OBJECTIVE:

To develop an effective and economically feasible method for using ongoing data collection systems to monitor the performance of prehospital care in an EMS system, to provide feedback information to providers based on the evaluation, and to assess the effect of this feedback on changes in performance.

SCOPE:

Building on a uniform data collection system used by 58 ambulance companies providing 75,000 trips per year in and around Pittsburgh, a computerized screening model was developed to identify cases in which EMTs deviated from normal care patterns, according to care protocols developed and validated by panels of physicians.

FINDINGS:

This system will provide communities with an efficient method for using uniform data collection systems to audit EMT performance and assure that care provided meets established standards. It was also the basis for developing an experimental model for use by a region in planning training, refresher training, and recertification programs.

TITLE: Computerized Prehospital Skill  
Deployment/Maintenance

GRANT NUMBER:  
I RO1 HS 03813

GRANTEE INSTITUTION: University of Pittsburgh

PROJECT PERIOD:  
09/01/79-08/31/81

PRINCIPAL INVESTIGATOR:  
Harvey Wolfe, Ph.D.  
Department of Industrial Engineering  
University of Pittsburgh  
Room 1043, Benedum Hall  
Pittsburgh, Pennsylvania 15261  
(412) 624-5430

AUTHORITY: 1205/EMS

FUNDING LEVEL:  
FY 79 \$222,000  
FY 80 \$222,000

OBJECTIVE:

To develop a methodology and associated model that can be utilized in planning and monitoring the manpower skill requirements of the prehospital phase of an Emergency Medical Services (EMS) system.

SCOPE:

This project uses the prehospital care algorithms and data collection systems already in place to develop and test a model of required prehospital care skills based on prehospital care demand as a function of population characteristics of the region. Performance monitoring will determine the extent to which the skill requirements are met by the EMTs in the field. An experimental program of continuing education will be designed, specifically targeted toward the performance deficiencies and skill decays which were identified. The program will be tested using paramedics randomly assigned to either an experimental group or a control group who will receive traditional, untargeted continuing education. The results of these activities will be used to develop a regional model of paramedic training requirements based upon population characteristics.

FINDINGS:

The expected product is a method whereby an EMS system can determine precisely how much and what kind of paramedic training it requires for effective prehospital care. Since large sums of money are being spent annually for the training and continuing education of prehospital care personnel, the potential of this model to increase the efficiency of such expenditures is very significant. It will allow administrators to make immediate training decisions, and also to anticipate the effects upon long-term resource requirements of changes in the system or the population served.

FISCAL YEAR 1979 - ACTIVE EMS-RELATED RESEARCH PROJECTS: 305.

TITLE: Socialization: EMS and Other  
Residency Programs

GRANT NUMBER:  
5 R01 HS 02129

GRANTEE INSTITUTION: College of Pennsylvania

PROJECT PERIOD:  
06/30/76-06/29/80

PRINCIPAL INVESTIGATOR:  
Rebecca A. H. Anwar, Ph.D.  
Emergency Medicine Section  
Medical College of Pennsylvania  
3300 Henry Avenue  
Philadelphia, Pennsylvania 19129  
(215) 842-6547

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 76 \$109,464  
FY 77 \$121,242  
FY 78 \$152,624  
FY 79 \$129,052

OBJECTIVE:

To examine physicians during their emergency medicine residency training, and to determine what characterizes and differentiates the process of professional socialization among emergency medicine residents as compared to physicians in other residencies.

SCOPE:

A national sample of emergency medicine residents is being compared with internal medicine and surgery residents. A panel design is being utilized to investigate career decisions. Such a design provides reliability in testing hypotheses regarding differences between the various specialties with respect to career expectations, commitment, professional identity, acquiring professional skills and attaining medical judgment.

FINDINGS:

Policy implications include: (1) staffing and management of EMS systems; (2) development of residency programs and teachers in the rapidly-expanding field of Emergency Medicine; and (3) ways in which resident selection, the process of graduate medical education, and organizational variables interact to influence career outcomes.

**TITLE: An X-Ray Screening Protocol for  
Extremity Injuries**

**GRANT NUMBER:  
1 R03 HS 03625**

**GRANTEE INSTITUTION: Yale University**

**PROJECT PERIOD:  
02/01/79-01/31/80**

**PRINCIPAL INVESTIGATOR:  
Donald A. Brand, Ph.D.  
Department of Surgery  
School of Medicine  
Yale University  
333 Cedar Street  
New Haven, Connecticut 06510  
(203) 436-3628**

**AUTHORITY: 305/EMSR**

**FUNDING LEVEL:  
FY 79 \$ 55,925**

**OBJECTIVE:**

To develop and test a method for reducing unnecessary x-ray films in the care of extremity injuries in Emergency Departments.

**SCOPE:**

Patients with upper and lower extremity injuries are being studied prospectively. Data are being gathered on patient characteristics and clinical manifestations, such as "swelling" and "limitation of motion", to identify the features which best indicate the presence of fracture, as determined by x-ray. The resulting model will be used to construct a protocol for use in judging the need for x-ray films. The protocol will be designed to reduce the number of x-rays without increasing the number of "missed" fractures beyond the status quo. Patients which the protocol identifies as low-risk will not be x-rayed, but will be followed up by telephone to disclose any indication that a fracture may have been missed and further examination is required.

**FINDINGS:**

Reducing the number of unnecessary x-ray films will result in substantial cost savings; the method proposed, if successful, can be used for x-rays of other types of injuries and will also be adaptable to other diagnostic procedures.



TITLE: A Computer Audit to Improve ER  
Drug Prescribing

GRANT NUMBER:  
1 R03 HS 03953

GRANTEE INSTITUTION: Yale University

PROJECT PERIOD:  
09/01/79-08/31/80

PRINCIPAL INVESTIGATOR:  
Donald A. Brand, Ph.D.  
Department of Surgery  
School of Medicine  
Yale University  
333 Cedar Street  
New Haven, Connecticut 06510  
(203) 436-3628

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 79 \$ 54,250

OBJECTIVE:

To measure the effectiveness of a computer-assisted medical audit in improving the ways in which drugs are prescribed in Emergency Rooms. The randomized controlled study will also determine (1) if improvements in prescriber behavior continue beyond the period of audit, and (2) the relative effectiveness of the audit as a function of the delay between the particular episode of patient care and the providers' receipt of the case audit report.

SCOPE:

The care of patients treated for soft tissue injuries in three hospital emergency departments, one of which will be used as a control group, is being reviewed during a one-year period. A computer-assisted audit comparing problem-specific medical records to a previously developed clinical algorithm is being conducted. Providers will receive daily case audit reports indicating instances of deviation from standard prescribing practices, and will be asked to give reasons for the deviations. The deviation rates will be used as the measure of improvement in drug prescribing and will be calculated before, during, and after the system has had a chance to influence physician behavior. Different feedback delays and hospital size, affiliations, and staffing patterns will be correlated with deviation rates.

FINDINGS:

The system as proposed has clear relationships to issues of cost containment, as well as problems in quality assurance, medical education and more rational drug prescribing practices. The approach can be applied to other clinical areas, both surgical and non-surgical. Since the computer-based system can be implemented through ordinary telephone lines, it would be useful for any institution desiring to monitor the care of its patients and provide continuing education to its physicians.

TITLE: Evaluation of Emergency Room  
Referral System

GRANT NUMBER:  
1 R03 HS 04005

GRANTEE INSTITUTION: Sinai Hospital of  
Baltimore, Inc.

PROJECT PERIOD:  
09/30/79-09/29/80

PRINCIPAL INVESTIGATOR:  
Evan Charney, M.D.  
Department of Pediatrics  
Sinai Hospital of Baltimore  
Belvedere and Greenspring Avenues  
Baltimore, Maryland 21215  
(301) 367-7800 x8267

AUTHORITY: 305/FMSR

FUNDING LEVEL:  
FY 79 \$ 46,783

OBJECTIVE:

To identify the demographic, medical, attitudinal and other factors which improve the chances of successful referral of patients from an emergency room to a source of continuous and comprehensive primary medical care.

SCOPE:

Using both retrospective and prospective record reviews as well as interviews with patients, the investigators are examining differences between those patients who comply with recommendations to seek primary care at an appropriate facility and those who do not comply with such recommendations. Comparisons between these groups include previous experience with medical care facilities, insurance status, socio-demographic data and urgency of symptoms. The effectiveness of different ways of making referrals will be examined, and reasons for failure to keep appointments will be explored.

FINDINGS:

Improper use of emergency rooms by patients with non-urgent conditions not only increases the costs of care, but also results in episodic, rather than continuous care; preventive care is not likely to receive proper emphasis in such a regimen. Attempts to refer patients to appropriate primary care centers have not been notably successful, however. Through learning more about the medical condition of patients who do not comply with referral recommendations, and determining which types of referral efforts are successful, it will be possible to ensure that these patients receive more appropriate and more economical care. The research findings will be important to issues surrounding emergency room and primary care center staffing, to patient education programs, and to preventive medicine efforts.

TITLE: Evaluation of Elements in a  
Community-Wide EMS System

GRANT NUMBER:  
5 R18 HS 01943

GRANTEE INSTITUTION: University of Washington

PROJECT PERIOD:  
06/30/75-08/31/79

PRINCIPAL INVESTIGATOR:

Leonard A. Cobb, M.D.  
Director

Division of Cardiology  
Harborview Medical Center  
325 Ninth Avenue  
Seattle, Washington 98104  
(206) 223-3301

AUTHORITY: 305/EMSR

FUNDING LEVEL:

FY 75: \$139,392.  
FY 76: \$100,077  
FY 77: \$ 92,808  
FY 78: \$ 9,280

OBJECTIVE:

To examine several aspects of the prehospital care of sudden cardiac arrest and acute myocardial infarction, emphasizing the role of cardiopulmonary resuscitation (CPR) administered by members of the public.

SCOPE:

Citizens given a brief course in CPR by the Seattle Fire Department are tested for proficiency using mannikins, both at completion of the training and at intervals thereafter. Examination of prehospital records identifies cases in which trained citizens administer CPR to victims of cardiac arrest. Another study is examining the effect upon outcome of prompt prehospital care, using records of 800 cases. Finally, special instrumentation is employed to examine the blood gas levels of heart attack victims in the field with a view to determining the value of intravenous sodium bicarbonate administration by ambulance personnel.

FINDINGS:

Most deaths due to coronary heart disease occur outside of hospitals. These sudden cardiac deaths are often not accompanied by warning symptoms, and the mechanism of death is usually ventricular fibrillation--a treatable abnormality of cardiac rhythm. There is no doubt that prehospital emergency care saves lives of some patients who experience heart attacks. Several facets of this study are concerned with measuring the magnitude of such effects and determining how best to utilize existing community resources. Findings to date associate bystander-initiated CPR with considerable increase in the chances of victims of cardiac arrest surviving with better brain function. They describe methods for improving the effectiveness and efficiency of present programs of bystander training, and they indicate improved likelihood of survival to hospital discharge with prehospital care during the first hour of onset of symptoms. Findings also suggest that the need for sodium bicarbonate injections is far less than previously recommended.

TITLE: Validation of Quality Assessment  
Measures in EMS

GRANT NUMBER:  
3 R01 HS 02149

GRANTEE INSTITUTION: Yale University

PROJECT PERIOD:  
06/01/76-10/31/79

PRINCIPAL INVESTIGATOR:  
William H. Frazier, M.D.  
Yale Trauma Program  
Yale University  
333 Cedar Street  
New Haven, Connecticut 06510  
(203) 436-4404

AUTHORITY: 305/FMSR

FUNDING LEVEL:  
FY 76 \$230,850  
FY 77 \$236,709  
FY 78 \$155,617  
FY 79 \$ 68,200

OBJECTIVE:

To examine the process of care in the Emergency Department, with the aim of developing and testing a quality assurance system.

SCOPE:

Clinical algorithms, or detailed guidelines incorporating branching logic, have been developed for several different conditions. In the case of soft-tissue lacerations, institution of a check-list calling for entry of all data required by the algorithm before audit dramatically increased the auditable cases (i.e., those with adequate information to trace the process of care). The algorithms for several additional conditions are being tested in a similar way; effects of rapid feedback to individual physicians based upon compliance with algorithms is being studied; and the usefulness of this quality assessment method in other hospitals is being tested.

FINDINGS:

Very little research has yet been done on the adequacy of care in an emergency facility. Explicit standards for this care, as represented by these algorithms, permit audit of medical decisions made and actions taken, and avoid unnecessary tests or procedures (which represent increased cost as well as risk to the patient). Preliminary results indicate a substantial improvement in physician performance from the use of algorithms with feedback.

TITLE: Diagnosis-Based Planning of  
Coronary Care Units

GRANT NUMBER:  
1 R03 HS 03538

GRANTEE INSTITUTION: Brooklyn College of CUNY

PROJECT PERIOD:  
09/30/78-09/29/79

PRINCIPAL INVESTIGATOR:  
James A. Greenberg, Ph.D.  
Assistant Professor  
Department of Health Science  
Brooklyn College  
Brooklyn, New York 11210  
(212) 780-5519

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 78 \$ 51,601

OBJECTIVE:

To develop and test criteria for planning coronary care units which can be used to promote cost-containment objectives.

SCOPE:

After completing a careful review and analysis of criteria and literature on coronary care unit treatment, the investigators are developing and testing new methods for performing cost impact analyses which are needed for rational coronary care unit planning. The state of New Jersey now has a coronary care unit treatment diagnosis-based data base that is being used for field-tests of the new criteria.

FINDINGS:

Results of this study will provide health planners with recommendations on the use of tested coronary care unit criteria for cost-containment planning. The policy issues to be addressed are those associated with the use of a high cost medical technology where there is considerable debate over its effectiveness in improving the outcome of health care.

TITLE: Assessing Emergency Systems  
Quality: Method Development

GRANT NUMBER:  
2 R18 HS 02467

GRANTEE INSTITUTION: Regents of the University  
of California, Los Angeles

PROJECT PERIOD:  
06/30/76-12/31/81

PRINCIPAL INVESTIGATOR:  
Sheldon Greenfield, M.D.  
Associate Professor of Medicine  
and Public Health  
University of California, Los Angeles  
School of Medicine  
Room 42-170, Center for Health Sciences  
Los Angeles, California 90024  
(213) 825-7578

AUTHORITY: 305/EMSR

FUNDING LEVEL:

FY 76	\$124,145
FY 77	\$154,473
FY 78	\$11,976
FY 79	\$203,792
FY 80	\$235,318
FY 81	\$243,000

OBJECTIVE:

To compare criteria mapping (CM) as a method of quality assessment in the Emergency Department (ED) with the explicit criteria list method used by Professional Standards Review Organizations. CM utilizes a branching logic format to generate patient-specific criteria to judge the care for any given subgroup of patients, based on estimation of the risk of serious disease.

SCOPE:

The existing chest pain CM study is being expanded to two new EDs to test generalizability of the CM methodology in other settings. At each new hospital ED, a panel of physicians is reviewing and modifying, if necessary, the original chest pain CM. Data are being abstracted from the patient records using both the original CM and modified CMs to compare their validity in terms of patient outcomes. The results of this portion of the study will be used to develop a chest pain CM training package for medical record abstractors that can be used in any ED to implement the CM method of quality assessment. In addition to extending the chest pain study to two new EDs, an abdominal pain CM is being developed. After testing the abdominal pain CM in the two hospitals where it is developed, its exportability will be tested by extending its use to two new EDs in the same manner as with the chest pain CM.

FINDINGS:

Results thus far show that the CM method can predict the outcome for chest pain patients and signal deficient care by identifying those patients for whom specific action should have been taken but was not. The final product will be a set of educational materials designed to train medical record abstractors in the use of CMs. This will enable any ED to implement the CM method to assess quality of care for patients presenting with chest pain or abdominal pain. This research is relevant to NCHSR's mandate to improve the quality of emergency care and develop cost-effective methods of assessing the quality of health care.



TITLE: Cost-Effective Strategies in  
Ambulatory Care

GRANT NUMBER  
7 R01 HS 04066

GRANTEE INSTITUTION: Peter Bent Brigham Hospital

PROJECT PERIOD:  
03/01/76-09/29/80

PRINCIPAL INVESTIGATOR:

Anthony Komaroff, M.D.  
Laboratory for Analysis of Medical Practice  
Peter Bent Brigham Hospital  
721 Huntington Avenue  
Boston, Massachusetts 02115  
(617) 732-7063

AUTHORITY: 305/EMSR

FUNDING LEVEL:

FY 76	\$225,807
FY 77	\$231,309
FY 78	\$192,733
FY 79	\$224,144

OBJECTIVE:

To design cost-effective strategies for common clinical conditions in ambulatory care and emergency room settings using conditional probabilities. The study also continues the development of a computerized quality of care evaluation checklist and the dissemination of clinical protocols.

SCOPE:

Techniques of decision analysis are used to determine the most efficient methods for gathering data and providing timely and proper treatment. Using data from the National Ambulatory Medical Care Survey, 30 prevalent urgent and non-urgent conditions have been selected for investigation. For each problem a decision tree is being designed which will identify the commonly employed diagnostic and therapeutic strategies. For each strategy, the investigators will identify the principal subgroups of patients for whom the strategies might differ.

FINDINGS:

The products of this effort will be a set of explicit decision strategies to guide the treatment of a number of urgent and non-urgent conditions frequently seen in emergency and out-patient facilities, as well as a procedure for determining the quality of care provided.

TITLE: Severity Index Construction:  
Methods, EMS Application

GRANT NUMBER:  
1 R18 HS 03090

GRANTEE INSTITUTION: University of Florida

PROJECT PERIOD:  
02/01/79-01/30/82

PRINCIPAL INVESTIGATOR:  
Jeffrey P. Krischer, Ph.D.  
Department of Community Health  
and Family Medicine  
Box J-222, MSB  
J. Hillis Miller Health Center  
Gainesville, Florida 32610  
(904) 376-1611 x548

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 79 \$114,277  
FY 80 \$122,277  
FY 81 \$131,000

OBJECTIVE:

To develop analytic methods for the construction of severity indices which are consistent with clinical judgments. Such indices will be useful in evaluating the adequacy, timeliness, and impact of emergency medical services.

SCOPE:

To develop and test indices of the severity of burns and trauma, and of the need for care, the investigators will use decision theory, utility theory and modeling of clinicians' judgments. Constructing the indices includes: defining attributes to be included in each index; testing the assumptions of the independence of attributes; assessing the relative weights of the attributes; assessing severity functions of each attribute; and modeling by combining the importance of each attribute and severity function into a single index. These indexes will then be tested against actual clinical data from the Florida Trauma Registry.

FINDINGS:

The expected findings are better methods to construct and test severity indices, together with two or three improved indices of severity and immediacy of need for care relating to trauma and burns. Such work is pertinent to legislation addressing Emergency Medical Services and the evaluation of such nationwide efforts.

TITLE: EMS Research Conference

GRANT NUMBER:  
3 R13 HS 03274

GRANTEE INSTITUTION: American College of  
Emergency Physicians

PROJECT PERIOD:  
09/01/78-08/31/79

PRINCIPAL INVESTIGATOR:  
Ronald L. Kröme, M.D.  
American College of Emergency  
Physicians  
3900 Capital City Boulevard  
Lansing, Michigan 48906  
(517) 321-7911

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 78 \$ 29,243  
FY 79 \$ 2,917

OBJECTIVE:

To conduct a conference and produce a report concerning the informational needs of Emergency Medicine physicians and suggest a subset of those needs for which research data are desired.

SCOPE:

Under the auspices of the Research Committee of the American College of Emergency Physicians, about 40 people representing the range of disciplines actively involved in providing emergency care met in groups of 8-10 persons. Using structured group process methods, the groups developed consensus listings and rankings of informational needs and are producing a report which will help to provide the basis for revising or expanding the EMS research agenda.

FINDINGS:

The proceedings of the conference will be disseminated to emergency physicians and trainees, and will be used in identifying important activities and needs of the Emergency Medical Services Research agenda of NCHSR, thereby contributing directly to improved emergency care and more effective EMS systems.

TITLE: Applications of Decision Theory  
to the Triage Process

GRANT NUMBER:  
1 R03 HS 03626

GRANTEE INSTITUTION: Georgetown University

PROJECT PERIOD:  
02/01/79-03/31/80

PRINCIPAL INVESTIGATOR:  
Robert S. Ledley, D.D.S.  
Department of Physiology and Biophysics  
Georgetown University  
3900 Reservoir Road, N.W.  
Washington, D.C. 20007  
(202) 625-2121

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 79 \$ 47,664

OBJECTIVE:

To explore the applicability of decision theory to the process of developing triage protocols and to define future research and data collection requirements for Emergency Medical Services (EMS) systems.

SCOPE:

The project is developing an algorithmic decision theory model for use in the prehospital sorting of acute trauma and burn patients. Clinical and operations research literature are used to estimate parameters for the mathematical model. Scenarios involving different time-to-treatment combinations and different survival curves are being developed. Clinical and logistical factors will be merged in the decision node of the triage process. In addition the study will determine the amount and precision of clinical data, and the level of precision in survival curves, necessary to support the triage process. Results will be tested and analyzed on the basis of hypothetical data. The final report will include the design of a follow-up study which can test the model against data from operational EMS systems.

FINDINGS:

Federal policy in EMS development centers upon determining the appropriate EMS facility to provide the level of care required and categorizing such facilities on a regional basis in order to provide effective and efficient care. Critical to such a scheme is the ability to classify patients according to the severity of their conditions. When fully developed, the methodology should provide analytic tools for use by regional health planning authorities, a quality control technique for the analysis of prehospital triage procedures, and improved input to EMS Technician and Dispatcher Training programs, as well as enhancing the emergency patient's probability of survival.

TITLE: Factors Determining Outcome of  
Hospitalized Trauma

GRANT NUMBER:  
7 RO1 HS 04029

GRANTEE INSTITUTION: University of Illinois

PROJECT PERIOD:  
09/30/78-09/29/80

PRINCIPAL INVESTIGATOR:

Paul S. Levy, Sc.D.  
University of Illinois at the  
Medical Center  
P.O. Box 6998  
Chicago, Illinois 60680  
(312) 996-8850

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 78 \$ 51,329  
FY 79 \$ 44,386

OBJECTIVE:

To continue preliminary efforts intended: 1) to develop an improved version of the Estimated Survival Probability index, and 2) to investigate the nature and strength of relationships between outcome of hospitalized trauma patients and such factors as age, sex, race, and initial severity.

SCOPE:

Data collected in the Hospital Discharge Survey in 1971-75 (a national survey of non-federal short-stay hospitals conducted by the National Center for Health Statistics) are being analyzed. Data are abstracted from face pages of sample medical records of discharge patients. A case-control methodology is being used on all patients who died (approximately 1,500) and a stratified random sample of about 3,000 patients discharged alive. Contingency tables are used to test appropriate hypotheses concerning differences in mortality rate in different hospitals and similar issues. This index will be a useful tool in understanding the factors associated with trauma and in testing some of the assumptions underlying the Federal EMS initiative.

FINDINGS:

These investigators are now making available to other investigators a computer tape (with documentation) of single-condition survival rates. With this tape, the ESP index can be computed simply from the listed codes on the medical records. This is the first study to examine outcome of hospitalized trauma against such variables as race, number of hospital beds and geographic area, controlling for such variables as age and severity of injury. This improved index will be a useful and valuable tool for assessing the effectiveness of EMS systems.

TITLE: Measuring the Quality of Survival  
in Burn Patients

GRANT NUMBER:  
1 R18 HS 03237

GRANTEE INSTITUTION: Baltimore City Hospitals

PROJECT PERIOD:  
02/01/79-06/30/80

PRINCIPAL INVESTIGATOR:  
Andrew M. Munster, M.D.  
Baltimore Regional Burn Center  
Baltimore City Hospitals  
4940 Eastern Avenue  
Baltimore, Maryland 21224  
(301) 396-8866

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 79 \$ 43,823

OBJECTIVE:

To develop a reliable and valid burn outcome scale based upon quality of life in survivors of burn injuries. Over 80 percent of hospitalized burn victims survive, so that survival alone appears to be inadequate to compare the outcomes of care or the effectiveness of burn centers. The new scale would make it possible to compare the outcomes of patients in different burn centers or in burn centers versus general hospital facilities at one point in time, and longitudinally across time. It could also be used as a prognostic indicator for clinical purposes.

SCOPE:

The scale will first use burn-relevant questions on level of recovery (disability, pain, etc.) from existing scales, and adding burn-specific questions developed by local patients and a consultant group. A small group of patients (about 30), discharged 1 to 3 months previously, will be monitored to yield pilot data for a subsequent major longitudinal effort.

FINDINGS:

Although over a million persons per year have been victims of burn injuries serious enough to warrant medical attention, burns as a public health problem have received relatively little attention. In 1976, Federal legislative action mandated the development of Regional Burn Centers as part of a national strategy of burn care. However, present understanding of burn outcomes is limited almost exclusively to mortality, although the value of specialized burn care may be more evident in differences among survivors of burns, such as restoration of joint function, appearance, and social adjustment.



TITLE: Burn Care Facility Study

GRANT NUMBER:  
1 ROI HS 03261

GRANTEE INSTITUTION: The Regents of the  
University of Michigan

PROJECT PERIOD:  
04/01/79-03/31/81

PRINCIPAL INVESTIGATOR:  
Beverly C. Payne, M.D.  
Health Services Research Center  
University of Michigan  
City Center Building  
220 E. Huron Street, 3rd Floor  
Ann Arbor, Michigan 48109  
(313) 763-1202

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 79 \$380,315  
FY 80 \$312,947

OBJECTIVE:

To develop methods to determine the cost effectiveness of special care facilities for burn patients. Measures of patient characteristics, architectural and organizational factors, quality of care, and costs of treatment are being tested for subsequent incorporation in a full-scale examination of patient care in different critical-care units, and in comparisons between specialized facilities and general hospital wards.

SCOPE:

The initial project is studying 1,000 patients in ten hospitals, six with specialized burn care facilities and four without. Instruments are being developed to collect data on five major types of variables: 1) patient outcomes; 2) patient prognostic indicators; 3) treatment variables; 4) organizational variables; and 5) costs. Data will be used in methodologic analyses and preliminary exploration of hypothesized relationships in preparation for a larger-scale study.

FINDINGS:

The costs of care in specialized facilities is considerably greater than in general hospital beds, and therefore there is an immediate need to determine which factors, if any, are associated with improved patient care before a planned program to establish burn care centers is undertaken. This study will provide the methods whereby such a determination can be made.

TITLE: Community Planning for Emergency  
Medical Services

GRANT NUMBER:  
3 RO1 HS 02512

GRANTEE INSTITUTION: University of Pittsburgh

PROJECT PERIOD:  
06/30/76-11/30/79

PRINCIPAL INVESTIGATOR:  
Edmund M. Ricci, Ph.D.  
A226 Crabtree Hall  
Graduate School of Public Health  
University of Pittsburgh  
Pittsburgh, Pennsylvania 15261  
(412) 624-3112

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 76 \$208,271  
FY 77 \$200,993  
FY 78 \$166,437  
FY 79 \$ 59,402

OBJECTIVE:

To describe in detail emergency care planning and system development in selected communities/regions throughout the U.S.; to identify the conditions which have led to improvement or lack of improvement in the community's ability to provide emergency medical services (EMS); to develop materials for education of health professionals and laymen in health planning and systems development; and to expand conceptual and theoretical knowledge of health planning and systems development.

SCOPE:

The investigator has systematically constructed the chronology of events relative to EMS planning in 16 communities or planning areas by means of personal interviews. Significant information has been obtained to identify both formal and informal structures and processes and to relate these structures and processes to levels of accomplishment as an outcome. Study communities or planning areas were carefully selected to include examples of areas which have made significant progress and those which have not. Interviews in each community were supplemented by appropriate descriptive and statistical documents (census data, minutes of meetings, planning documents, grant applications, etc.). The process has been described in sufficient detail to permit the research group to develop a computer simulation of the planning effort.

FINDINGS:

The study will identify conditions that facilitate or impede the planning process. The emergency medical services system program offers a convenient model for analysis. Training materials for professionals will be available which will have potential for direct benefits in improving the planning skills of those involved in EMS system development and improvement.

TITLE: A Guide to Investment Criteria  
for Critical Care Units

GRANT NUMBER:  
1 R03 HS 03569

GRANTEE INSTITUTION: Columbia University

PROJECT PERIOD:  
09/30/78-11/30/79

PRINCIPAL INVESTIGATOR:

Mark Sherman, Ph.D.  
Center for Community Health Systems  
Columbia University  
21 Audubon Avenue  
New York, New York 10032  
(212) 694-6884

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 78 \$ 47,280.

OBJECTIVE:

To review and synthesize all existing research and analyses related to investment criteria for critical care units for the purpose of developing a guidebook that will be useful to state and local health planning agencies.

SCOPE:

The literature review and analyses will include publications on planning and evaluation of critical care units; studies which evaluate efficacy, cost effectiveness and cost benefits of critical care units; methodological summaries of techniques from other fields with potential applicability to health planning; and studies conducted by state and local governments.

FINDINGS:

This guidebook will identify the major questions that state and local health planning agencies must address when making decisions regarding the costs and benefits of critical care units.

TITLE: Locational Analysis of Multilevel  
EMS Systems

GRANT NUMBER:  
1 R03 HS 03722

GRANTEE INSTITUTION: University of Texas at  
Austin

PROJECT PERIOD:  
08/01/79-07/31/80

PRINCIPAL INVESTIGATOR:  
James E. Storbeck  
Center for Cybernetic Studies  
University of Texas at Austin  
Austin, Texas 78712  
(512) 471-1821

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 79 \$ 26,682

OBJECTIVE:

To develop techniques for locating three types of emergency medical services units characterized by different levels of basic and advanced life support capabilities.

SCOPE:

Techniques used in operations research will be employed. Taking information on the population density of points covering the area to be served, and given the number of units of each of the three types and a maximum response time standard for each type, the method will specify locations for each unit which maximize the number of people who could be served within the specified time standards.

FINDINGS:

Although models for ambulance unit location are available, none has been developed for multiply tiered systems in which first-response and Basic Life Support units are augmented by smaller numbers of very expensive Advanced Life Support units. Optimal location of these various units can maximize the effectiveness of a given level of resources in the growing number of communities with such tiered systems.

TITLE: Computer-Based Ambulatory Quality Assurance Program

GRANT NUMBER:  
3 R48 HS 02142

GRANTEE INSTITUTION: Harvard Community Health Plan

PROJECT PERIOD:  
05/01/76-10/31/79

PRINCIPAL INVESTIGATOR:  
Richard N. Winickoff, M.D.  
Harvard Community Health Plan  
690 Beacon Street  
Boston, Massachusetts 02215  
(617) 216-3100 x325

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 76 \$140,094  
FY 77 \$205,632  
FY 78 \$230,861  
FY 79 \$ 59,978

OBJECTIVE:

To develop a quality assurance program based on a computerized ambulatory medical record.

SCOPE:

The investigators are constructing and testing process and outcome measures to assess the quality of care via computer-based records regarding eight tracer disease conditions, including both emergency and non-urgent health problems. These assessment methods are being tested through actual use in a large ambulatory clinic practice, and their ability to improve care in various out-patient settings, including Emergency Rooms, will be considered.

FINDINGS:

Quality Assessment using process and outcome criteria will meet formal requirements of the HMO Act of 1973. The study will demonstrate the utility of the COSTAR (Computerized Stored Ambulatory Record) system in monitoring compliance with requirements for quality care established for out-patient clinics and will assess the impact on provider and system behavior of concurrent information feedback to providers.

TITLE: Efficient Resource Allocation in  
Special Care Networks

GRANT NUMBER:  
1 R03 HS 03157 .

GRANTEE INSTITUTION: Stanford University

PROJECT PERIOD:  
08/01/78-07/31/80

PRINCIPAL INVESTIGATOR:

Ruby M. Wong  
Graduate School of Business  
Stanford University  
Stanford, California 94305  
(415) 497-1850

AUTHORITY: 305/EMSR

FUNDING LEVEL:  
FY 78 \$ 31,583

OBJECTIVE:

To develop a day-to-day resource allocation system for regional referral networks of special care centers and referring hospitals. The successful procedures will be incorporated in a computer-based system to assist in resource allocation decisions, and the computerized interactive system will be compared with currently used manual systems.

SCOPE:

This study is developing, demonstrating, and evaluating a resource allocation system. The emphasis is not to focus on a single objective (e.g., reducing response time) but rather to achieve solutions which are consistent with the many objectives of an efficient resource allocation center, with special emphasis on the cost benefits of a computerized system compared to manual systems. The system will be tested in a simulated environment (simulation model). The new system will be evaluated in the Northern California Infant Medical Dispatch Center using parallel automated and manual dispatching of a set of sample episodes.

FINDINGS:

The computer-based system will improve decisions concerning resources needed for patient care at special care centers and will thereby produce measurable cost benefits. The availability of this system will facilitate efficient use of regional health services especially with regard to the needs for expensive special care resources in rural areas.



<b>BIBLIOGRAPHIC DATA SHEET</b>		1. Report No. <b>NCHSR 80-27</b>	2.	3. Recipient's Accession No.
4. Title and Subtitle <b>EMERGENCY MEDICAL SERVICES SYSTEMS RESEARCH PROJECT ABSTRACTS, 1979; NCHSR Research Management Series</b>			5. Report Date <b>September 1979</b>	
7. Author(s) <b>National Center for Health Services Research Staff</b>			8. Performing Organization Rept. No.	
9. Performing Organization Name and Address <b>National Center for Health Services Research, OHRST, PHS, DHEW Division of Extramural Research, Room 8-27 3700 East-West Highway Hyattsville, MD 20782 (Tel.: 301/436-8936)</b>			10. Project/Task/Work Unit No. ---	
12. Sponsoring Organization Name and Address <b>DHEW, PHS, OHRST, National Center for Health Services Research 3700 East-West Highway, Room 7-44 Hyattsville, MD 20782 (Tel.: 301/436-8970)</b>			11. Contract/Grant No. <b>In-house</b>	
15. Supplementary Notes <b>DHEW Pub. No. (PHS) 80-3271, See PB 292,558 for 1978 report and PB 273 893 for 1977 report.</b>			13. Type of Report & Period Covered <b>Management series rpt.</b>	
16. Abstracts <p>This document is a compilation of abstracts which describes research grants related to Emergency Medical Services Systems' techniques, methods, devices, and delivery, supported by the National Center for Health Services Research (NCHSR) during 1979. These abstracts contain the objective, scope and findings (or expected findings) for each project. Administrative information, such as grantee institution, address and telephone number of the principal investigator, project period, project funding history, etc., is also included.</p>				
17. Key Words and Document Analyzers - 17a. Descriptors  <p>Marian M. Fane: NCHSR Public Health Analyst; AC 301/436-8936.</p>				
17b. Identifiers (Open-Ended Terms) <b>Health services research Emergency medical services systems research projects, 1979: NCHSR Research Management Series. EMS 1979 EMS research EMS techniques</b>				
17c. COSATI Field Group				
18. Availability Statement <b>Releasable to the public. Available from National Technical Information Service, Springfield, VA (Tel.: 703/557-4650) 22161</b>			19. Security Class (This Report) <b>UNCLASSIFIED</b>	21. No. of Pages Est.: <b>56</b>
			20. Security Class (This Page) <b>UNCLASSIFIED</b>	22. Price

