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IMPERIAL COUNTY

EMERGENCY MEDICAL SERVICES AGENCY

TRIAL STUDY

RURAL EMT EXPANDED SCOPE OF PRACTICE

“ADVANCED EMT”

FINAL REPORT

Imperial County Emergency Medical Services Agency

Advanced EMT Trial Study
3-YEAR FINAL REPORT

January 7, 1999

Introduction

This report presents activities of the Advanced EMT Trial Study program for the second 18 months of operation (June 1997 – December 1998), along with a summary of the three-year study (December 1995 – December 1998). The program is working well and there have been no significant errors or complications.

No new training classes were conducted during the second 18-month period. Three classes were conducted during the first 18-months. Eighteen (18) EMT's (six per class) entered training and fourteen (14) satisfactorily completed all requirements. Ten (10) of the fourteen AEMT's (71%) are still in the program.

The following is a list of the agencies currently participating in the trial study:

<u>AGENCY</u>	<u>AEMT's</u>
Niland Fire Department	4
Calipatria Fire Department	2
Holtville Fire Department	1
West Shore Ambulance Service	1
Bombay Beach Ambulance Service	2

<u>Program Activity:</u>	<u>2nd 18 Months</u>	<u>3 Year Totals</u>
<u>AEMT Total Responses:</u>	<u>108*</u>	<u>268*</u>
BBRS	38	77
Niland F.D.	37	120
WSAS	19	53
Calipatria F.D.	14	18
Holtville F.D.	0	0

*Two responses involved an AEMT First Responder handing patient care over to an AEMT Transport Provider (no paramedic ambulance was immediately available to respond).

Chief Complaint:

Chest Pain	23	76
Chest Pain w/SOB	19	51
Respiratory Distress	39	81
Altered Mental Status	10	22
Cardiopulmonary Arrest	9	20
Allergy/Anaphylaxis	2	8
Poisoning/Ingestion	4	8
Near Drowning	0	0

<u>Medications Administered</u>	<u>2nd 18-Months</u>	<u>3-Year Totals</u>
Nitroglycerin	51	142
Albuterol	34	87
Aspirin	25	50
Glucagon	10	20
Epinephrine	2	8
Naloxone	4	6
Activated Charcoal	2	4

Skills Performed:

Combitube:	Attempted	8		19	
	Placed	6	(75%)	15	(79%)

Of the two events during the 2nd 18-month period in which the Combitube was not placed successfully, the AEMT was unable to advance the combitube in one event, and the other involved not being able to confirm placement after 2 attempts at intubation. Both events resulted in the combitube being removed and ventilations continued with bag-valve-mask.

		<u>2nd 18-Months</u>	<u>3-Year Totals</u>
AED:	Applied	8	18
	Shock delivered	1	4

		<u>2nd 18-Months</u>	<u>3-Year Totals</u>		
<u>Documentation:</u>	Appropriate	65	(61%)	194	(73%)
	Minor omission	39	(37%)	63	(24%)
	Major omission	2	(2%)	9	(3%)

Most of the minor omissions during the 2nd 18-month period are a reflection of one individual's documentation. This problem was corrected through remediation.

	<u>2nd 18-Months</u>	<u>3-Year Totals</u>
<u>Improvement:</u>	55/106 (52%)	160/266 (60%)

During the 2nd 18-month period, 52% of patients demonstrated evidence they were improved by field treatment. This includes 37 patients who reported symptomatic improvement of 2 points or greater on 1-10 scale; and 18 patients who experienced improvement in vital signs (to include BP toward normal by 20%, pulse toward normal by 15%, respirations toward normal by 15%, glucose level return to normal range, and/or improved GCS).

Changes to AEMT Scope of Practice

A trial of standing orders was implemented during the 2nd 18-months, with approval from the EMDAC SOP Committee, and became effective March 1, 1998. There were no errors in the use of these protocols. (See attachment for revised protocols).

	<u>2nd 18-Months</u>	<u>3-Year Totals</u>
<u>Treatment Appropriate:</u>	100/106 (94%)	250/266 (94%)

During the 2nd 18-month period, 94% of the assessments were complete enough to justify treatment, and correct protocol was selected and used appropriately.

Complications: There were no complications of medication administration or skills interventions.

Errors: There were no major errors.

There was one case in which the treatment given was not in accordance with protocol. A 32 year old male was attacked by swarm of Africanized honey bees. Patient was alert with urticaria all over body. Vitals: pulse – 64, resp. – 24, BP – 118/64, lung sounds – wheezes. AEMT selected the right protocol, but chose to administer albuterol and then reevaluate patient for consideration of epinephrine administration. The protocol calls for epinephrine first, followed by albuterol if wheezes persist. Paramedics arrived eight minutes after AEMT and administered epinephrine SC.

	<u>2nd 18-Months</u>	<u>3-Year Totals</u>
<u>Mean time to ALS:</u>	41 min.	41 min.

This is the time interval from when the Advanced EMT arrives on scene until patient delivered to ALS level care to include either a meet with a paramedic unit or delivery to the emergency department. This interval shows how long patients would have had to wait to receive the advanced interventions. This average was remarkably close for both the first and second 18-month trial periods (1st – 40 min. and 2nd – 41 min.)

Continuing Education and Competency Evaluation:

Continuing Medical Education is conducted quarterly to include case review, testing, and skills evaluation. Advanced EMT's are required to attend quarterly CME and successfully pass a comprehensive written and skills recertification examination every two years. All of the Advanced EMT's have successfully passed the required testing and have consistently demonstrated skills proficiency.

Issues:

Turnover has occurred and has affected primarily the two remote ambulance providers, West Shores Ambulance Service (WSAS) and Bombay Beach Rescue Service (BBS). Typically, an EMT will join one of these ambulance providers for a short time, and then leave due to the isolation, low call volume, and low pay. There is one AEMT still employed part time with WSAS (two have left for other employment – higher wages and job stability). Two AEMT's are still employed part-time with BBS (two have left for employment reasons). Of the two remaining, one is in the nursing program and one is in the paramedic program (both are expected to leave the area upon successfully completing their training programs).

Niland Fire Department has all four of its original AEMT's, Calipatria Fire Department has two AEMT's (one left to work for the State prison), and Holtville Fire has one AEMT. The fire departments have retained AEMT's better than the private ambulance providers. This may be due in part because the fire departments employ volunteers who have other full time careers. They are content to serve as volunteers and enjoy being able to better serve their communities as AEMT's. However, these rural, volunteer fire agencies have also experienced problems with the availability of their AEMT's. During the 2nd 18-months, one AEMT sustained injuries that put him out of work for approximately 6 months; one went on maternity leave for 8 months; and one was hired as a reserve deputy sheriff (he is still a volunteer firefighter and AEMT).

The turnover and unavailability of AEMT's with the remote ambulance providers and rural volunteers demonstrates the need to offer the training program annually. In order for the program to be successful, volunteers and rural EMT's must be able to complete the program quickly. The EMT-II program, offered through the local community college, requires nine (9) months to complete. Volunteer firefighters, who are the backbone of EMS in these rural/remote communities, have other full-time jobs and are not able to make the commitment to attend a full-time training program. The AEMT program was designed to meet the needs of these volunteer first responders. The continuation of the AEMT program is vital to ensure that early advanced care is consistently available in the remote areas of Imperial County.

Conclusions:

1. During the 2nd 18-month period, AEMT's continued to accurately assess patients, and successfully provide advanced procedures well before ALS would otherwise be available. Patients' conditions are improved by AEMT treatment. This is most evident with allergic reactions, hypoglycemia, and narcotic overdose, although chest pain and respiratory distress patients improved also.
2. EMT-I's can successfully be taught select advanced skills and use them effectively in a rural setting.
3. There continues to be strong support for the program among rural providers and the public.
4. There have been no significant complications or errors. Education and feedback modify and improve performance.
5. The State EMS System Plan "Guidelines" direct local EMS Agencies to plan for eventual provision of advanced life support services throughout their jurisdictions (Section 1.08).

Through the Advanced EMT Program, the EMS Agency has achieved this objective by developing an innovative approach to financial and training barriers that can ensure limited advanced life support services throughout the rural and remote areas of Imperial County.

Recommendations:

1. The AEMT program is successful and State regulations should be amended to recognize this level of provider.
2. The AEMT program in Imperial County should be allowed to continue until regulations are changed.
3. We should study the effect of authorizing select AEMT's to perform the quarterly skills evaluations, and evaluate the optimal method of delivery of case review and other CME.

APPENDIX 1

Sample Cases:

29 year old female found unresponsive at home. Prior to unconsciousness, she told neighbor she had taken overdose of medicine (Tylenol w/codeine). Respirations 10/min. shallow, pupils – pinpoint. AEMT administered oxygen and Naloxone 2 mg IM. Patient awoke and respirations increased to 20/min. AEMT response time was 3 min. ALS ambulance arrived in 20 min.

58 year old female c/o allergic reaction to medication. She gave herself a vitamin injection that she had purchased in Mexicali. She c/o urticaria all over body, eyes swollen shut, difficulty breathing with wheezing. Friend drove her to the Fire station. AEMT administered oxygen and Epinephrine 0.3 mg SC. Patient breathing easier and eyes open. Wheezes persisted after Epi so an albuterol treatment was given. After treatment, clear lungs. ALS ambulance arrived in 47 min.

88 year old male with hx of diabetes found in bed with altered mental status. AEMT response time was 5 minutes. AEMT administered oxygen, Glucometer – 23, gave Glucagon 1 mg IM. Patient LOC improved, responding to voice appropriately. ALS ambulance arrived in 30 minutes.

85 year old male c/o chest pain – substernal pressure radiates to both arms, and shortness of breath after much dancing. Chest pain rated at 8 on scale, pale/moist skin, lung sounds – rales, respirations - 24. AEMT response time was 2 min., administered oxygen, Nitro .4 mg 1/150 gr. SL and 2 chewed baby aspirin. Pain diminished to 4 on scale after 5 minutes. Another Nitro given and pain diminished to 1 on scale and patient resting comfortably and breathing easier. ALS ambulance arrived in 55 minutes.

60 year old female with hx of heart disease and hypertension, c/o chest pain, (substernal pressure), rates it a 9 on scale, and shortness of breath. AEMT

response time was 6 minutes. AEMT administered oxygen and Nitro 0.4 mg 1/150 gr SL and 4 chewed baby aspirin (320 mg). Pain diminished to 5 on scale. AEMT gave another Nitro and pain diminished to 0. The ambulance transported to Pioneers Hospital in Brawley – arrived at E.D. in 65 minutes.

APPENDIX 2

Definitions:

Complication – Side effect of medication or treatment that may result in harm to patient. Not an error.

Documentation appropriate – Sufficient history, medications, etc. to justify treatment. Assessment, history, and vital signs recorded appropriately. Medications, doses, treatments with patient's response recorded in legible fashion. Times and patient disposition recorded. Major omission involves lack of sufficient history, medications to justify treatment, failure to record medication or dose, failure to record needed response to treatment and follow-up vital signs.

Error – Mistake by provider. Use of protocol incorrectly, medication error, error in skill use.

Improvement – Patient reported symptomatic improvement in severity of distress of at least two points measured with the 1-10 symptom severity scale; or improvement in vital signs: BP moved toward normal by 20%, pulse toward normal by 15%, respirations improved by 15%, blood glucose return to normal range or mental status improved measured by GCS; or return of spontaneous circulation.

Time to ALS – Length of time for ALS provider (EMT-P, EMT-II) to arrive on scene, or time to arrival at hospital if no ALS meet available.

Treatment Appropriate – Assessment complete enough to justify treatment and correct protocol selected and used appropriately.

APPENDIX 3

Summary of Imperial County Advanced EMT Trial Study:

Experienced EMT's were individually selected for the program. The training consists of approximately 76-100 hours above the EMT-Basic level and includes 40 hours didactic, 16 hours clinical in the Base Hospital emergency department, and a minimum 16 hours field internship on an ALS unit with paramedic preceptor. Skills include Combitube, Automatic External Defibrillation (a pre-requisite for the program), medication administration via sublingual, subcutaneous, intramuscular, and oral routes and include Epinephrine 1:1,000, Naloxone, Glucagon, Nitroglycerin, nebulized albuterol, aspirin, and activated charcoal. There was ongoing Continuing Medical Education and monitoring.

IMPERIAL COUNTY

EXPANDED SCOPE "ADVANCED" EMT-I

EXCERPTS FROM ORIGINAL REQUEST FOR TRIAL STUDY

REQUEST FOR APPROVAL
RURAL EMT-I EXPANDED SCOPE OF PRACTICE
TRIAL STUDY

DATE: 10/20/95

INTRODUCTION:

Small, rural communities are scattered across Imperial County in isolated locations. In addition to year-round residents, these communities attract large numbers of elderly residents ("snowbirds") during the winter season. Many of the residents have chronic illnesses, and EMS calls in those communities involve conditions that may benefit from ALS treatment, especially chest pain and respiratory distress.

These areas are 30-45 minutes from existing ALS units. We have attempted to help these communities maintain ALS, but that proved to be impossible. Typically a paramedic will join a small ambulance service for a short period of time, and then leave due to the isolation, low call volume, and low pay. Simply maintaining EMT-basic level response and transport is difficult. The large time commitment for EMT-II training makes that option impossible.

We are proposing an expansion of the scope of practice for EMT-Is in several isolated communities so that selected ALS skills and medications can be provided. Initial communities would be Bombay Beach, on the eastern shore of the Salton Sea, that includes the "Fountain of Youth" spa; Niland, which also serves the "slabs", a large, informal community of mobile homes in the hills east of the Salton Sea; the Desert Shores/West Shores area on the western shore of the Salton Sea; and, possibly, one or two additional areas, depending on interest and resources. (Please see attached summary of communities and map).

NAME OF PROPOSED PROCEDURE OR MEDICATION:

The expanded scope would include:

- ✓1. Combitube
2. Automated External Defibrillation (already approved and in use)
- ✓3. Determination of blood glucose levels
4. Medications
 - ✓A. Albuterol, metered dose inhalers or nebulized
 - B. Activated Charcoal
 - ✓C. Aspirin
 - ✓D. Epinephrine via EpiPen (or similar device)
 - ✓E. Glucagon
 - ✓F. Naloxone
 - ✓G. Nitroglycerin, sublingual/lingual preparations

MEDICAL CONDITIONS:

The expanded scope of practice will be used in clinical conditions that warrant treatment under the following treatment protocols:

Allergic Reaction and/or Anaphylaxis
Altered Neurologic Function (Non-traumatic)
Cardiopulmonary Arrest
Chest Pain (suspected cardiac origin)
Near Drowning
Poisoning
Respiratory Distress
Smoke, Gas and Toxic Substance Inhalation

PATIENT POPULATION:

Patients who fit the Treatment Guidelines above (see below), who are residents of the communities involved in the study.

RELEVANT STUDIES:

There is growing recognition that formerly advanced skills may be performed, at least to a limited extent, by basic personnel. The new Department of Transportation EMT-Basic curriculum includes an optional module for endotracheal intubation, and EMTs assisting patients with their own nitroglycerin, glucose solutions, epinephrine injections, and bronchodilators.

A recent abstract reported that EMT-basics successfully performed endotracheal

intubation in 46% of candidate patients (Sayre, et al: Field Trial of Endotracheal Intubation by Basic EMT's. Scientific Abstracts National Association of EMS Physicians, 1995). Another recent paper reported on the successful use of epinephrine by rural EMTs among a small group of patients with anaphylaxis (Fortenberry et al: Use of Epinephrine for Anaphylaxis by Emergency Medical Technicians in a Wilderness Setting. Ann Emerg Med, June 1995).

PROPOSED STUDY DESIGN:

EMTs will be selected for this program based on satisfactory performance as an EMT-basic and EMT-D. They will be evaluated for their likelihood to remain in the community, and must satisfactorily complete a screening evaluation by their provider agency, EMS agency staff, and the base hospital coordinator. Candidates will be evaluated by a pre-test. All individuals initially selected will be members of a local fire department or employed by an ambulance provider. We anticipate a first class of six individuals, two each from three providers in separate areas.

Didactic education will total 40 hours, followed by two 8 hour clinical sessions in a hospital emergency department and two 8 hour field clinical sessions with an ALS unit and paramedic preceptor. In each location the EMT must successfully complete five ALS contacts. A summary of the lesson plans is attached. The complete curriculum is available for review upon request.

We anticipate the expanded scope EMT-Is will respond to the majority of EMS calls in their communities, but, depending on days off, they may not always be available. They will initiate the study ALS procedures using standing orders and base hospital contact. In the Bombay Beach and West Shores areas they will transport the patient to a hospital with treatment en-route, although in selected cases they may arrange for a rendezvous with an ALS unit. In the Niland area, the expanded scope EMT-Is will be part of the first response agency only, and will be met on-scene by an ALS unit. Patients generally will be transported to Pioneer's Hospital in Brawley (Imperial County), although occasionally they may be transported north into Riverside County.

Continuing education will be provided (see CME requirements). The study will continue for 18 months, and then be evaluated for extension. All required reports will be submitted to the EMS Authority.

The program's effectiveness will be evaluated in several ways. First, the expanded scope EMTs' retention of knowledge, assessment skills and skills performance will be evaluated by post-tests after routine CME, and randomly at other times.

Second, all patient contacts will be reviewed to evaluate EMT performance. There will be an evaluation of patient assessment, including congruence with hospital diagnosis; documentation; appropriateness and performance of field interventions, including

whether interventions were actually performed when indicated; and, patient outcome, measured by change in vital signs and outcome. We will use a simple 1-10 analog scale for reporting progression or improvement of symptoms.

Third, for all cases the estimated time interval will be recorded that ALS would have been provided without the availability of the expanded scope EMT. The reason for any rendezvous with paramedics will be recorded.

We anticipate patients will receive ALS interventions more quickly, that patient conditions will improve during treatment, that any deterioration in a patient's condition will be attributable to the underlying medical problem. In the initial phase our end-points will be accurate assessments congruent with later hospital diagnosis, the provision of correct treatments when indicated, and an estimated decrease in the time interval to the administration of these treatments. We recognize that in some cases now there is not 100% congruence between ALS assessments and hospital diagnoses.

If resources allow in the future, we will attempt to compare this treatment regimen to outcomes without this regimen (BLS only).

MEDICAL CONTROL:

Medical control will be through the specific expanded scope EMT-I Treatment Guidelines (attached) and base hospital contact. All patient contacts will be reviewed by the Base Hospital Coordinator (a Registered Nurse) and/or EMS Agency staff (paramedic) within seven days. All cases will be reviewed by the medical director. The EMS Agency will establish policies and procedures regarding certification, continuing education, data collection, and other operational procedures.

TRAINING AND COMPETENCY TESTING:

Training will follow a curriculum and lesson plans adapted from the Imperial Valley College paramedic training program. A summary is attached. Training sessions will be conducted by the EMS coordinator (see attached CV). Competency testing, both written and skills examinations, will be included in the training program. There will be both hospital clinical time and field preceptorship time, as outlined above.

Continuing education and on-going evaluation of competence will be provided according to the schedule attached.

MEDICAL ADVISORY COMMITTEE:

The study proposal was reviewed and approved by a local medical advisory committee composed of emergency medical technicians, nurses, physicians, trainers, and base hospital personnel active in the EMS system. Letters of endorsement are available.

**IMPERIAL COUNTY
RURAL EMT-1 EXPANDED SCOPE OF PRACTICE**

DESCRIPTION OF COMMUNITIES

**DATA COLLECTION
FOR CONSIDERATION OF
RURAL EXPANDED-SCOPE EMT-1**

Report for FY '95 Ending 06/30/95

WEST SHORES AMBULANCE SERVICE - is a private, non-profit, subscription supported ambulance service that services the communities of Desert Shores and Salton Sea Beach located along the west bank of the Salton Sea. These communities have a stable population of approximately 3,000 and a visitor population of 2,000 - 3,000 more during the winter months. There is no real industry that supports these communities. Most of the residents and visitors are retired seniors. Patients are transported to either Pioneers Memorial Hospital in Brawley or to JFK Hospital in Indio - both of which are located approximately 45 miles away.

TOTAL CALLS THIS YEAR - 435
MONTHLY AVERAGE - 36

<u>CALL TYPE</u>	<u>PERCENT OF TOTAL</u>
Vehicle Accidents	19%
Difficulty Breathing	11%
Chest Pain	8%
CPR	8%
Altered Neurologic Function	11%
All others	43%

<u>LEVEL OF CARE</u>	<u>PERCENT OF TOTAL</u>
EMT-P	6%
EMT-II	3%
EMT-1	91%

BOMBAY BEACH RESCUE AMBULANCE SERVICE - also a private, non-profit, subscription supported ambulance service that services the community of Bombay Beach which is located along the eastern shore of the Salton Sea. Bombay Beach is a wilderness community with a stable population of approximately 2600 and a visitor population of an additional 4000 (mostly retired seniors) who reside at the "Fountain of Youth" Spa just east of town. Patients are transported to either Pioneers Hospital in Brawley or JFK in Indio - both of which are approximately 45 miles from town.

TOTAL CALLS THIS YEAR - 316
MONTHLY AVERAGE - 26

<u>CALL TYPE</u>	<u>PERCENTAGE OF TOTAL</u>
Vehicle Accidents	23%
Difficulty Breathing	8%
Chest Pain	11%
CPR	8%
Altered Neurologic Function	11%

All others 39%

<u>LEVEL OF CARE</u>	<u>PERCENTAGE OF TOTAL</u>
EMT-P	0%
EMT-II	0%
EMT-1	100%

NILAND FIRE DISTRICT - a rural first responder fire service located approximately 20 miles north of Brawley where the nearest ALS ambulance is stationed. The town of Niland is classified as rural and is supported primarily by agriculture. Niland has a stable population of approximately 1,280 and a visitor population (the majority of whom are retired elderly) of approximately 3,000 during the winter months. Many of the visitors will camp at the "slabs" approximately 5 miles east of town (the remnants of a W.W.II military installation) during the winter months - an area without plumbing or electricity.

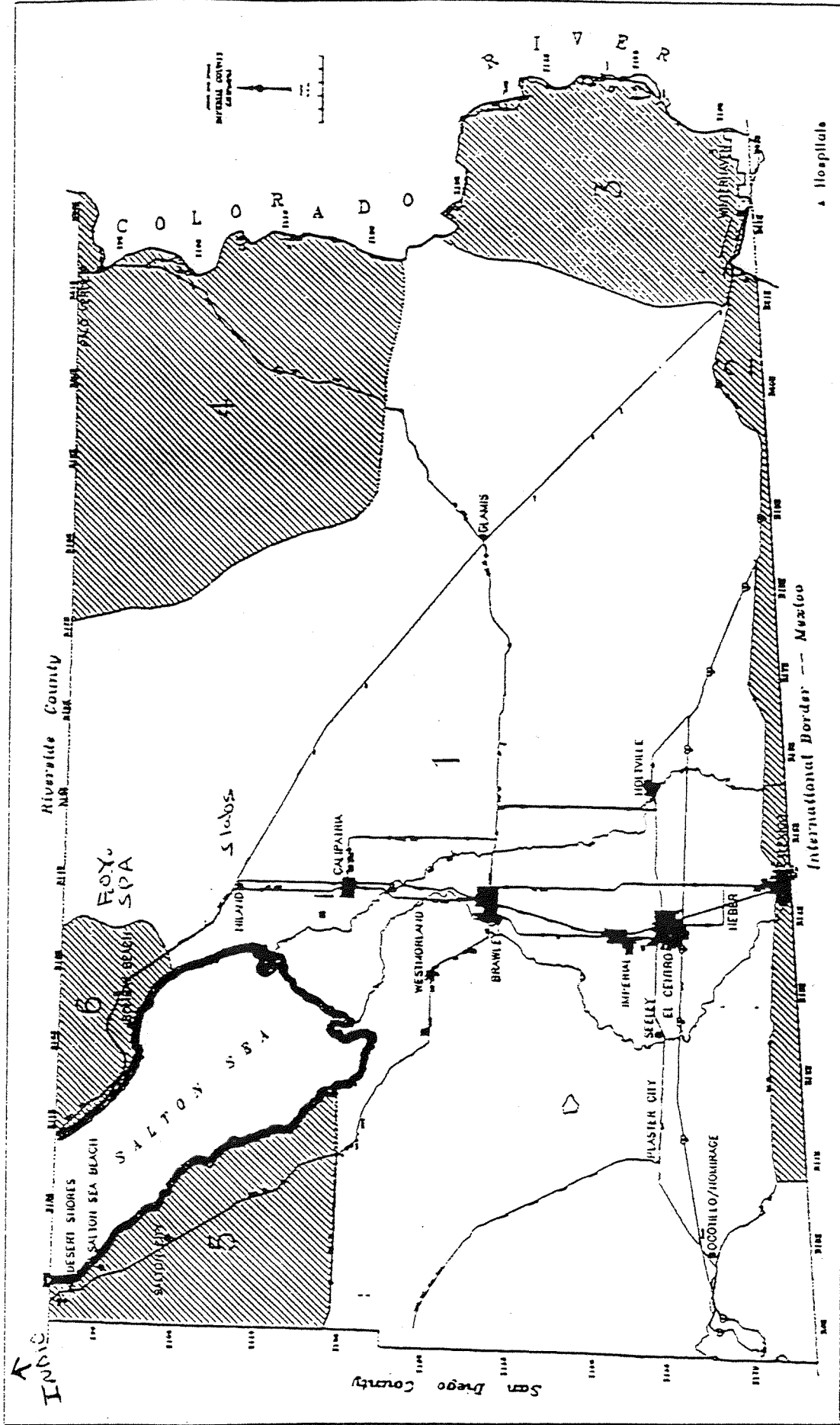
TOTAL CALLS THIS YEAR - 544

MONTHLY AVERAGE - 45

AVERAGE ON-SCENE TIME PRIOR TO ARRIVAL OF AMBULANCE - 32 MINUTES

<u>CALL TYPE</u>	<u>PERCENTAGE OF TOTAL</u>
Vehicle Accidents	36%
Difficulty Breathing	26%
Chest Pain	20%
CPR	2%
Altered Neurologic Function	7%
All others	9%

<u>LEVEL OF CARE</u>	<u>PERCENTAGE OF TOTAL</u>
EMT-1	100%



IMPERIAL COUNTY (AMBULANCE DISTRICTS) - 1994
 Imperial County Planning/Building Department
 County of Imperial, California (1994)

IMPERIAL COUNTY
EXPANDED SCOPE "ADVANCED" EMT-I
TREATMENT PROTOCOLS

IMPERIAL COUNTY EMERGENCY MEDICAL SERVICES AGENCY
Policy and Procedures Manual

Operations: Medical Control

Date: 03/01/98

PROTOCOL UPDATE

The following AEMT protocols are in effect as of March 1, 1998.

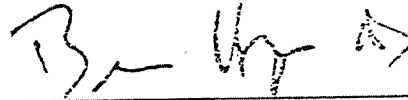
Advanced EMTs are instructed to contact the Base Hospital as soon as possible after initiating any standing orders. Advanced EMTs should also document on the patient care report form any treatment initiated on standing orders.

Questions or problems with this update should be directed to the EMS Agency at 339-4468.

Approved:



Administration
John W. Pritting
EMS Coordinator



EMS Medical Director
Bruce E. Haynes, M.D.