Government of Guam
Office of Comprehensive Health Planning

# Emergency Medical Services Plan

First Edition

1976

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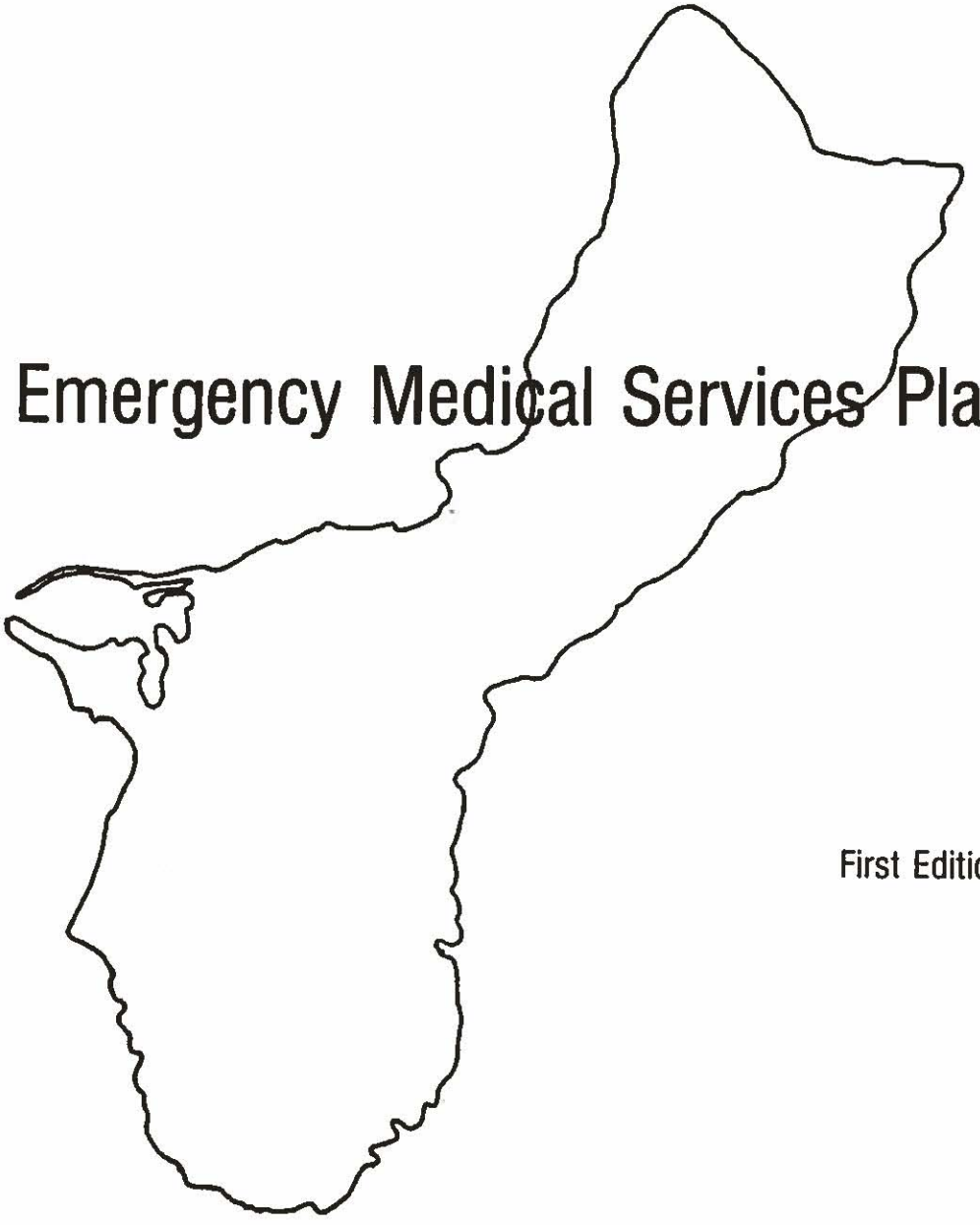

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# TABLE OF CONTENTS

CHAPTER PAGE

# LIST OF EXHIBITS

# I. INTRODUCTION

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In the past sixty years more U. S. citizens died from accidents than from combat wounds in all our wars. The total annual cost of accidents, including wage losses, medical expenses and property damage, approaches one-fifth of the Federal government's annual budget.

Accidents are the leading cause of death for all persons between the ages of one and 37, and rank second for the entire population of Guam. Each year more children are injured or die due to accidents than from any other cause. The accidental death rate reaches its peak between the ages of two and three years.

Roughly half of the accidental deaths in 1974 were from automobile accidents and the slaughter on our roads continues unabated. Statistics on the number of preventable accidents are not available but it has been demonstrated that reduced speeds, improved road pavement, properly placed signs and directions as well as the use of safety belts can substantially reduce automobile accidents as well as expand upon public awareness.

Accurate statistics for accidents which occur in the home and during recreational activities are virtually non-existent. Because Guam is a major tourist site, recreational accidents have an impact on the Emergency Medical System. Further, lack of information concerning home or recreation accidents means reducing the planners ability to determine need or project utilization of resources.

Statistics gathered on a national or regional basis are of value in indicating broad trends, but errors of judgement may result if these alone are used as a guide to local action. It is important that the Emergency Medical Services (EMS) plan of Guam be based not on subjective impressions but on an objective

assessment of the existing system, evaluated in the light of probable future needs.

The EMS plan presented in the following pages is an initial step in this direction. As with other components of the present comprehensive health plan and future State Health System Plan (required under P.L. 93-641), it is anticipated that the EMS plan will be reviewed and redrafted annually. Within the next year some of the objectives stated in this plan will be achieved while others may be delayed or changed. The involvement of a broad spectrum of the community will remain the key factor in future EMS plans.

One final word of caution concerning an EMS plan: the services described in this plan are designed to provide information specific to the needs of emergency medical care. A comprehensive health plan will provide more depth as well as a broader description of the medical services discussed in this plan.

## 1. LEGAL AUTHORITY

The Emergency Medical Service System (EMSS) Act (PL93-154) and the Highway Safety Act of 1966 provide funds for developing plans for Regional Emergency Medical Service systems. The following plan was developed as a result of a successful application for funds under the EMSS Act by the Department of Public Health and Social Services.

Executive Order 76-6 dated January 27, 1976 states in part that "the Emergency Medical Services Advisory Board shall have the following objectives:

1. Survey emergency medical resources available to local citizens and to visitors to the Territory of Guam.

2. Make recommendations regarding hospital emergency departments, ambulance services, training programs, facilities and communications systems and related legislation.

3. Serve in an advisory role to the Department of Public Health and Social Services and the Department of Public Works, Office of Highway Safety in their Emergency Medical Services Program.

4. Review and comment on major federal fund requests for improvement of emergency medical service capabilities.

5. Serve as a catalyst to effect cooperative arrangements for improveing and best utilizing emergency medical resources in Guam. (This should include promoting and guiding the development of emergency medical service projects designed to meet identified needs locally.)

6. Develop and implement a comprehensive Emergency Medical Services Plan.

The development of an EMS plan is the initial act in providing guidance for the establishment of a system of medical services.

## 2. THE PURPOSE OF THE PLAN

The Emergency Medical Services Systems Act was established to develop systems of emergency medical care that would significantly decrease current death and disability rates. The intent of the EMSS Act is to initiate regional planning. Such planning should seek to integrate the 15 mandatory components, prescribed by HEW Guidelines, so as to provide the essential EMS services for all emergency patients.

Based upon the feasibility report and meetings with the Ad Hoc EMS Advisory Committee, it was determined that Guam's EMS plan should provide the foundation for:

- Creating a coordinated system to manage emergency medical services
- Outlining needed EMS training and public education programs
- Determining communication needs
- Assessing the adequacy of the response/transport capabilities

- Assuring a proper classification system for medical care of the emergency patient

## 3. SCOPE OF THE EMS PLAN

From our earliest analysis of the emergency medical service system, it was apparent that Guam's situation is made more difficult by its remote, isolated geographic characteristics, and the limited life support systems, both advanced and basic, available to the population. An example, is the minimal level of first aid training provided public safety ambulance attendants. Currently only one ambulance attendant is certified Emergency Medical Technician-Ambulance (EMT-A). The other attendants are not qualified at the EMT-A level. Further, the limited population and economic resources dictates that a sophisticated advanced life support system will require time and proper staging of additional resources to implement.

The scope of this initial EMS Plan is to review the total EMS system; however, special attention has been given to form the foundation of the system. They are:

- To set forth specific training and public education program needs
- To set forth the type of communication system required to meet the EMS system needs.
- To set forth the type of measurement criteria needed to determine the response/transport capabilities of the system.
- To set forth the bases of a classification system for treatment of the emergent patient.

The integration of the various EMS activities is another essential component which has been addressed in this plan. This is a necessary component during this initial period given the fragmented, duplicated nature of the existing system.

## 4. METHODOLOGY

Because of the specific nature of the EMS plan and the various technical skills involved, the Government of Guam through funds available under the EMSS Act obtained the services of Arthur Young and Company, an international management consulting firm to assist in the drafting of this plan. Exhibit I, following this page, is a schematic of the planning process used in developing the EMS Plan.

Consumer and provider participation has been an integral aspect of the EMS plan from the beginning. Once the plan was drafted the Ad Hoc EMS Advisory Committee met to review and comment upon specific aspects of the plan's accuracy, relevance and practicality. Their comments and suggestions have been incorporated into this first draft of Guam's EMS Plan.

The process followed in this plan consists of three phases. The first phase was intended as an orientation for the consultant to work with the staff and EMS Advisory Committee to identify planning objectives and data needs. The second phase was to develop an understanding of the Emergency Medical System, identify the community's wants as well as the community's needs. During Phase III the consultant drafted the EMS Plan for Guam. The objective was to draft a plan which represents the interest and input of the staff, the EMS Ad Hoc Advisory Committee and representatives of the health care system.

## 5. PROBLEMS AND CONSTRAINTS IN DEVELOPING THE EMS PLAN

A number of constraints were identified in developing this first Draft. The most severe problem was the limited information available concerning the existing system. This caused difficulty in determining trends and projecting future needs. Further, it was difficult to state completely the current utilization of services as well as total number of patients treated in specific categories.

Public education programs are either new to Guam or have maintained limited information concerning their program impact. Therefore, information concerning the number of currently certified first aiders, CPR trained, etc., is not available.

Finally, much of the data we studied from various public sources was either inaccurate or the collection process was in question. To indicate that existing data is inadequate or not available the statement "to be developed" is used in this plan. In the Recommended Goals section, objectives for the design and implementation of data systems is noted.

It would be well for the Government to establish data collection and analysis standards. Further a statistical methods course should be designed for agency personnel required to develop public information based on data collected locally or through the federal census.

# SCHEMATIC OF THE PLANNING PROCESS

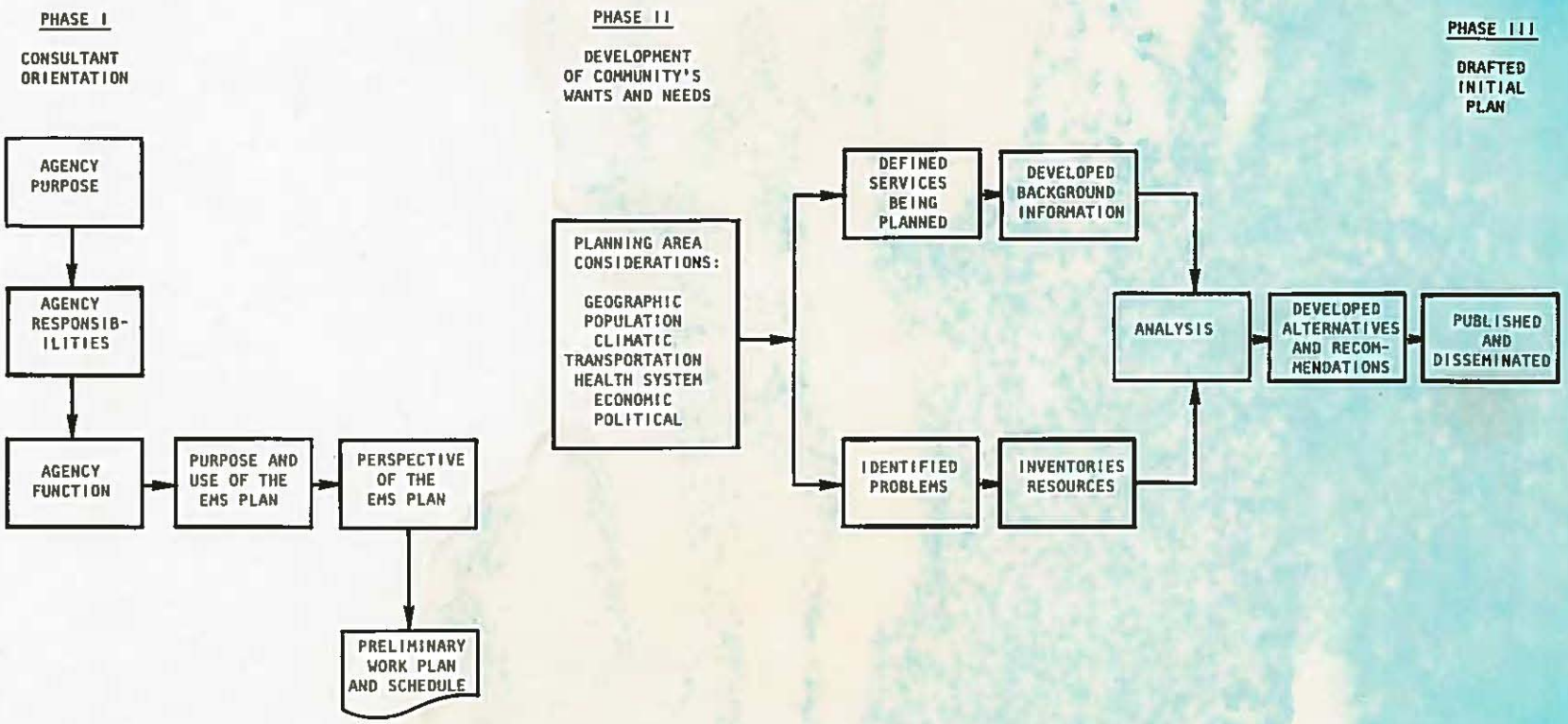


EXHIBIT I

# II. DESCRIPTION OF THE EMS PLANNING AREA

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The objective of this chapter is to provide an overview of the EMS planning area. The overview will be presented through a discussion of the EMS area's characteristics organized into the following four major categories:

- Geographic
- Population
- Transportation; and
- Health Care Delivery System.

The characteristics to be discussed were selected based on their relevance to the development of an EMS plan, and to the plans subsequent implementation.

### 1. GEOGRAPHIC CHARACTERISTICS

This section will describe the geographic characteristics of Guam through a discussion of the Island's location, topography and climate. The objective is to identify geographic constraints and other natural phenomenon which may affect the quality and/or delivery of emergency medical services.

#### (1) Location

The Island of Guam lies at the southern-most end of the Marianas, about 4116 miles west of Honolulu, 1500 miles east of the Phillipines, and 1550 miles north of Japan. It is approximately 30 miles long and from 4 to 8 miles wide, with an area of 212 square miles.

Guam's isolated location is significant to the development of an EMS plan for the following reasons: the transportation

of critically ill or injured patients to special facilities off island, establishment of mutual aid agreements, difficulties in obtaining assistance in the event of mass casualties, and continuity of care.

(2) Topography

Guam is the largest of the 15 Mariana Islands. It is an island characterized by two distinct topographical features, uplifted coral terraces in the north, and hills of volcanic origin in the south.

The physical features of the area impacts upon the patterns of health care utilization, because of the natural harbors significant to the Island and the focus of the population in that central region of the Island. Further, the topographical features of the southern portion of the Island with its mountainous characteristics has not been able to support a sufficient number of people; consequently, medical resources have not developed in this region. Travel time for these small population clusters in the south are also impeded by the terrain.

(3) Climate

The climate on Guam is typically characterized by warm weather, with temperatures ranging from $72^{\circ}$F to $88^{\circ}$F. This appealing climate has created seasonal visitors. Whether tourists or temporary residents the potential result is the same, these individuals can place an added, sometimes unforeseen burden on the Island's emergency medical care system.

The usual temperate climate of Guam is frequently interrupted with typhoons and heavy rainfall. The most alarming evidence of the traumatic impact typhoons can have

on Guam and its EMS system was in 1962 when Typhoon Karen swept directly over the Island. The typhoon caused extensive damage to the Island. The consequences for a short period being the medical service system was rendered practically inoperable, many roads became impassable, and communications was practically eliminated. Since this experience Guam has established disaster plans and procedures that will assist in avoiding similar disruptions to effective services in the event of future natural disasters.

(4) Summary

In summary, it is important that the Island's location, topography and climate be considered in the development of this EMS plan. If these geographic characteristics were not accurately reflected in EMS planning it is unlikely that a viable EMS system could develop.

## 2. POPULATION CHARACTERISTICS

This section discusses those population characteristics of the Island that are relevant to the development of an EMS plan. The characteristics that will be discussed include the total population of Guam; projected growth figures; income, education and employment composition; and accident and death statistics.

The objective of this section is to develop an understanding of how these various population characteristics might impact demand for services, and the need for emergency medical resources.

### (1) Population Size, Age and Sex

The 1975 projected population indicates that there are approximately 116,358 inhabitants on Guam. For details refer to Exhibit I following this page. As noted no figures are currently available regarding the age and sex distribution

of the island's population. When these figures become available it is important to analyze the age categories into which the population falls. The significance of this information to an EMS plan lies in the fact that certain age groups are more likely than other groups to require emergency medical services. For example, aged segments of the population are more likely to be the victims of heart attacks, strokes and certain types of accidents. Younger individuals are more typically the victims of health problems caused by traumatic accidents. The determination of potential types of emergency health conditions the population may encounter is necessary to the development of an EMS program.

(2) Population Projection

Change in any population is the result of two factors;

- The relationship between the number of births and the number of deaths
- The relationship between the number of people who move in and out of a given area.

Until a census of the population is conducted, the projected population to 1980 shown in Exhibit I is the most reliable data available. The recent economic changes internationally, especially in Japan, may have a negative impact upon these projects. The limited employment opportunities on Guam may reduce the projected population figures even further. If this is the case the need for an accurate census is even more important.

(3) Population Composition

Guam's estimated 1975 population of 116,358 individuals is primarily composed of persons born on Guam, migrants from the Phillipines, and the United States and U.S. military personnel and their dependents.

Guam's population is best categorized as permanent and transient. The permanent group is composed primarily of Guamanians, Statesiders, and aliens who have made Guam their home. The transient portion of the population includes military personnel and their dependents, short-term contract aliens, temporary Stateside workers, and visitors.

Statistics from the Department of Commerce indicate that Guam has experienced increasing numbers of total visits over the years. In 1973, 241,146 individuals visited Guam. For details refer to Exhibit II on the following page.

Although it is difficult at any time to predict with accuracy the probable demand on the EMS system, it is nevertheless important to bear in mind that the EMS system must be designed such that it has the potential to absorb the additional demand placed on it by its tourist/visitor population. In addition it must recognize when it can reasonably shift or reduce resources when visitor and business slowdowns occur. For example, research indicates that the Island's total visitor count in 1974 dropped to 8% from an average annual growth rate of 46% between the years of 1969-1973. Business travellers to the Island decreased as well in 1974 by 50%. The implication is that the demand for emergency medical services will slacken and thus existing emergency medical resources can more appropriately be utilized.

(4) Population Location

The greatest percentage of the population live in the north central region. This area extends from Dededo in the north, to Yona in the south, and along the midsection of the Island from Agana to Harmon in the west, to Barrigada and Mangilao in the east. Exhibit III, following this page, depicts the Civilian Population Percentages by Region and Village.

The greatest number of people reside in the middle of the Island. However, both the north and south contain a thirty-four (34%) percent of the total population of the Island. This becomes even more significant when it is demonstrated that all physician manpower and medical facilities are located in the west central section of the Island.

(5) Employment

Population of Guam can further be characterized by type of employment. The Department of Labor indicates in its 1974 statistics that Guam has a total of 38,480 individuals employed. Exhibit IV, following this page, details the total Guam employment profile, by industry division and selected major groups for the year 1974. The significance of this information to the EMS plan lies in the fact that certain industry groups will experience greater accident rates as they are more vulnerable to occupational hazards than others. Of the total number employed 22% are in the construction industry, possibly the most hazardous work on the Island. From the other occupations it is difficult to determine which jobs may or may not be hazardous.

(6) Education

Currently no updated statistics exist on education level of Island residents. Thus an analysis of the frequency of accidents by educational level, or the utilization of the EMS system by educational level cannot be developed at this time. However, we will identify two issues regarding education on the Island that may impact upon the effectiveness of the EMS system:

. The effect of educating the population to the potential dangers on the Island will impact the EMS system. For example, programs educating visitors/ tourists to the driving requirements of Guam, to the meaning of traffic signs; the education of all persons to water safety; to

## VISITOR ARRIVALS, BY PURPOSE AND COUNTRY OF ORIGIN: CY 1968-1974

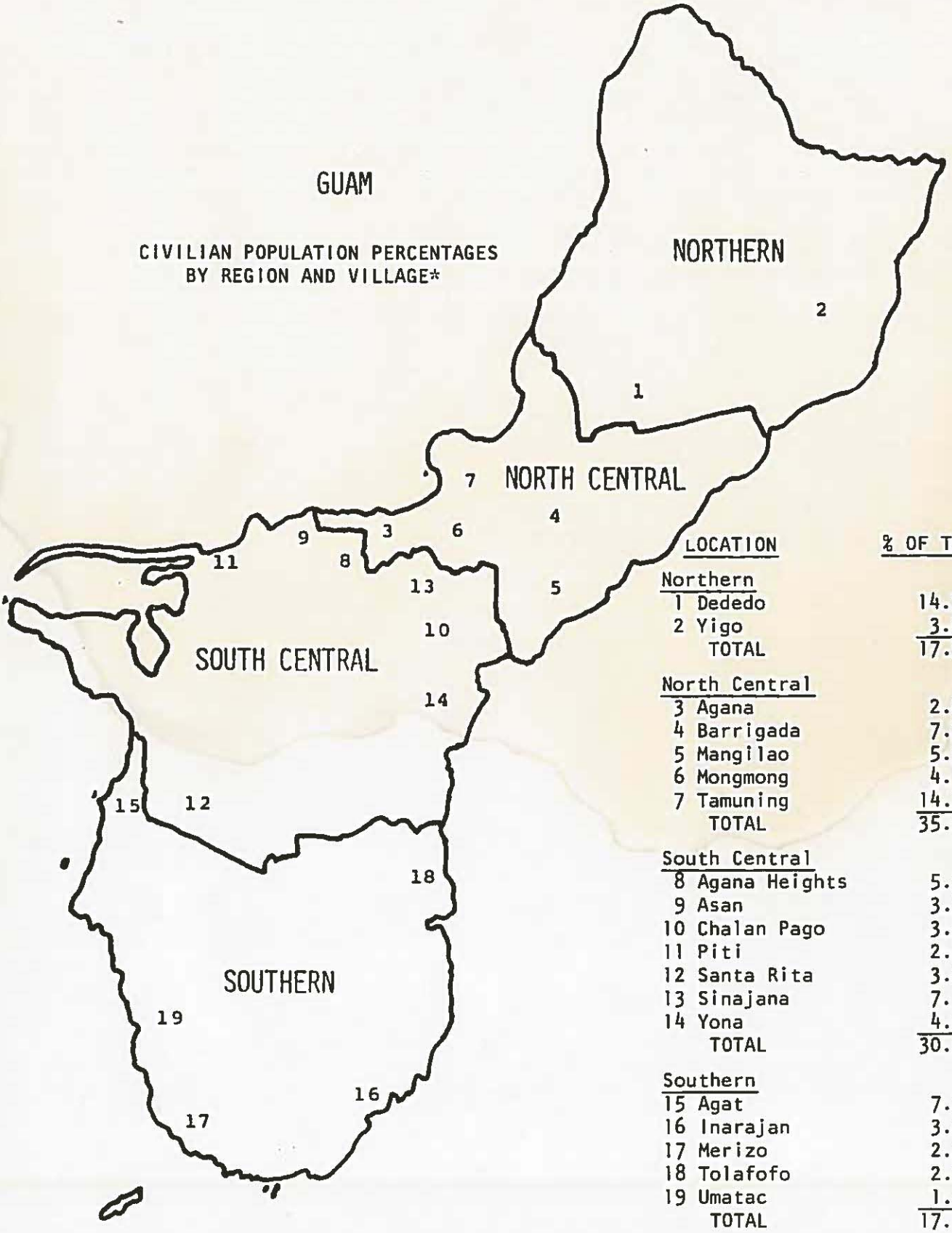
| Calendar Year | Total | Business | Pleasure | Other | Japan | United States | Pacific Trust Territory | Other |
|---|---|---|---|---|---|---|---|---|
| 1968 | 18,000 | 725 | 15,082 | 2,193 | 35.0% | 38.0% | 12.5% | 14.5% |
| 1969 | 58,265 | 14,264 | 30,810 | 13,191 | 50.0 | 32.0 | 9.0 | 9.0 |
| 1970 | 73,723 | 10,531 | 46,581 | 16,611 | 59.8 | 24.4 | 7.7 | 8.1 |
| 1971 | 119,174 | 13,325 | 84,885 | 20,964 | 70.5 | 16.6 | 6.2 | 6.7 |
| 1972 | 185,399 | 21,514 | 139,833 | 24,052 | 74.9 | 15.6 | 4.0 | 5.5 |
| 1973 | 241,146 | 25,622 | 187,471 | 28,053 | 69.1 | 15.2 | 6.5 | 9.2 |
| 1974 | | | | | | | | |
| January | 23,533 | 1,106 | 21,062 | 1,365 | 70.9 | 11.3 | 7.7 | 10.1 |
| February | 22,702 | 885 | 20,977 | 840 | 72.4 | 12.0 | 5.6 | 10.0 |
| March | 29,564 | 946 | 27,879 | 739 | 80.1 | 9.2 | 4.7 | 6.0 |
| April | 20,110 | 1,006 | 17,958 | 1,146 | 59.6 | 12.6 | 8.1 | 19.7 |
| May | 20,807 | 1,082 | 18,685 | 1,040 | 60.0 | 9.9 | 7.2 | 22.9 |
| June | 16,574 | 994 | 14,088 | 1,492 | 50.5 | 14.6 | 12.9 | 22.0 |
| July | 16,732 | 1,054 | 14,457 | 1,221 | 57.1 | 12.3 | 11.1 | 19.5 |
| August | 27,298 | 1,338 | 24,267 | 1,693 | 78.1 | 8.4 | 8.3 | 5.2 |
| September | 15,897 | 1,097 | 13,481 | 1,320 | 57.9 | 11.9 | 9.4 | 20.8 |
| October | 21,483 | 988 | 19,292 | 1,203 | 63.6 | 7.8 | 6.2 | 22.4 |
| November | 23,535 | 847 | 21,958 | 729 | 62.0 | 7.5 | 5.5 | 25.0 |
| December | 22,333 | 1,117 | 19,787 | 1,429 | 63.4 | 11.3 | 9.7 | 15.6 |
| TOTAL | 260,568 | 12,460 | 233,891 | 14,217 | 66.1 | 10.5 | 7.7 | 15.7 |

Source: Economic Research Center, Department of Commerce, Government of Guam.

EXHIBIT II

# GUAM

CIVILIAN POPULATION PERCENTAGES
BY REGION AND VILLAGE*




| LOCATION | % OF TOTAL |
|---|---|
| **Northern** | |
| 1 Dededo | 14.3 |
| 2 Yigo | 3.6 |
| TOTAL | 17.9 |
| **North Central** | |
| 3 Agana | 2.6 |
| 4 Barrigada | 7.7 |
| 5 Mangilao | 5.9 |
| 6 Mongmong | 4.1 |
| 7 Tamuning | 14.7 |
| TOTAL | 35.0 |
| **South Central** | |
| 8 Agana Heights | 5.5 |
| 9 Asan | 3.8 |
| 10 Chalan Pago | 3.4 |
| 11 Piti | 2.1 |
| 12 Santa Rita | 3.8 |
| 13 Sinajana | 7.1 |
| 14 Yona | 4.3 |
| TOTAL | 30.0 |
| **Southern** | |
| 15 Agat | 7.3 |
| 16 Inarajan | 3.2 |
| 17 Merizo | 2.7 |
| 18 Tolafofo | 2.6 |
| 19 Umatac | 1.4 |
| TOTAL | 17.1 |
| TOTAL PERCENTAGE | 100.0 |

Source Data - Population Projection for Guam, Economic Research Center, Department of Commerce, Government of Guam, May 13, 1970.

* The 1971 actual figures were used to calculate the percentage of the total population in each village. It was assumed that the population density by village remained relatively constant between 1971 and 1975.

EXHIBIT IV

## TOTAL GUAM EMPLOYMENT, BY INDUSTRY DIVISION AND SELECTED MAJOR GROUPS: MARCH 1974

| Industry Division & Major Groups | Establishment | Employment[P] |
|---|---|---|
| TOTAL | 1,350 | 38,480 |
| Private sector | 1,281 | 22,530 |
| Agriculture | 9 | 120 |
| Construction | 199 | 8,280 |
| General contractors | 171 | 7,790 |
| Special trade contractors | 28 | 490 |
| Manufacturing | 45 | 1,760 |
| Durable goods | 21 | 570 |
| Nondurable goods | 24 | 1,190 |
| Transportation and public utilities | 82 | 1,530 |
| Local passenger transportation | 6 | 90 |
| Trucking and warehousing | 15 | 280 |
| Water transportation | 7 | 130 |
| Transportation by air | 9 | 420 |
| Transportation services | 35 | 150 |
| Communication | 6 | 400 |
| Sanitary services | 4 | 60 |
| Trade | 514 | 5,640 |
| Wholesale trade | 75 | 650 |
| Building materials and farm equipment | 20 | 280 |
| Retail general merchandise | 69 | 870 |
| Food stores | 44 | 710 |
| Automotive dealers and service stations | 47 | 720 |
| Apparel and accessory stores | 50 | 210 |
| Furniture and home furnishing stores | 29 | 260 |
| Eating and drinking places | 101 | 1,240 |
| Miscellaneous retail stores | 79 | 700 |
| Finance, insurance and real estate | 124 | 1,170 |
| Banking | 21 | 700 |
| Credit agencies other than banks | 13 | 90 |
| Insurance agents, brokers and services | 30 | 200 |
| Real estate | 59 | 180 |
| Services | 308 | 4,030 |
| Hotels and other lodging places | 17 | 1,420 |
| Personal services | 44 | 260 |
| Miscellaneous business services | 47 | 480 |
| Auto repair, services, and garages | 34 | 360 |
| Miscellaneous repair services | 17 | 70 |
| Amusements including motion pictures | 34 | 380 |
| Medical and other health services | 24 | 180 |
| Legal services | 12 | 80 |
| Educational services | 25 | 280 |
| Nonprofit membership organizations | 8 | 30 |
| Miscellaneous services | 46 | 490 |
| Public sector | 69[1] | 15,950 |
| Federal government | 24 | 7,380 |
| Territorial government | 45 | 8,570 |

[1] Represents the number of reporting units in government sector usually at the department or agency level.

P = Preliminary

Source: Bureau of Labor Statistics, Department of Labor, Government of Guam.

the danger of undercurrents, to the existence of deadly cone shells and other poisonous sea life can all reasonably be expected to reduce the frequency of such problems.

. The effect of educating the population on how to properly use the EMS system will impact the effectiveness of the system.

More specifically, studies have indicated that population groups with higher educational levels are more familiar with how and when to utilize health services. Based on this fact it is likely that an educational profile of the population will indicate what groups might need special assistance in understanding how to best use the system.

(7) Motor Vehicle Accidents

Motor vehicle accidents are a major problem on the Island of Guam. In 1974, over 4100 people were involved in vehicle accidents, which surpasses the 1964 total by four times. Also, injuries and fatalities caused by these accidents reflect gradually increasing trends. It must be noted that the mere increase in both population and vehicle density have been contributing factors to this problem.

The ratio of fatalities and injuries to total accidents for the years 1964 through 1974 reveals, on average, that although a greater number of accidents did occur there were fewer fatalities/accident, and fewer injuries/accident in 1974 than there were in 1964. In this case the implication is that the tragedy of vehicle fatalities and injuries can be reduced, the task, however, is to determine what role emergency medical services can play in such a program.

(8) Accident Frequency by Time of Day and Month

For the years 1972 through 1974 statistics indicate that the bulk of vehicle accidents occur between the hours

of 10 a.m. and 8 p.m., a situation that has remained relatively constant at least since 1972. The majority of accidents (31%) occur between 3 and 7 pm; most of the non-fatal injury accidents occur at this time. The majority of fatal accidents occur between 11 pm and 3 am.* These facts are important to EMS manpower planning and scheduling for peak periods. For details on the number of vehicle accidents that occurred by time of day see Exhibit V.

A survey of the accidents that occurred by month in 1974 revealed no particular pattern, but rather indicated a constant accident rate throughout the year at about 345 accidents per month. Similar studies for those both killed and injured by month for the year 1974 indicates an average of 2.08 killed and 90 injured per month. In summary, although the total number of accidents is increasing, fatalities and injuries associated with these accidents have been gradually declining. As stated earlier, this implies that there is the potential for an EMS plan to impact the number of deaths and injuries caused by vehicle accidents.

(9) Accident Location

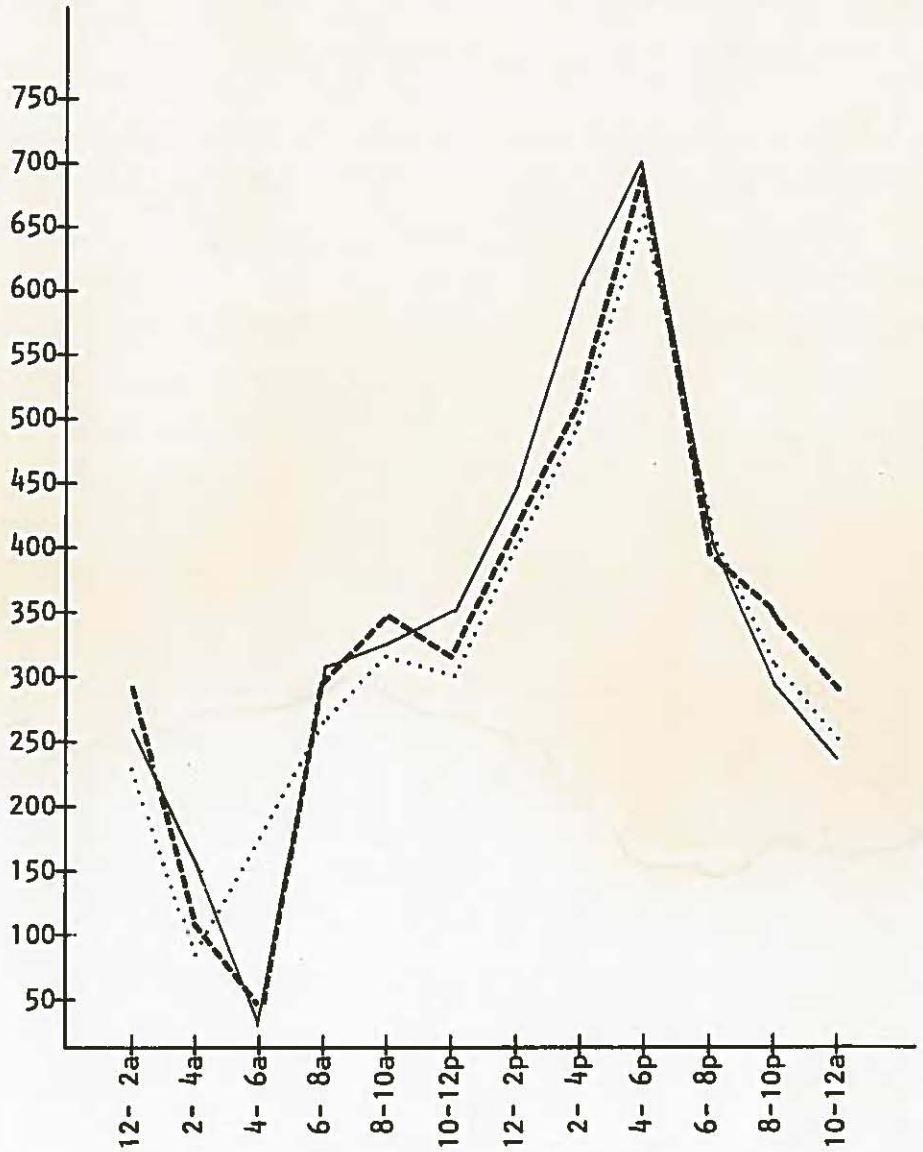
An analysis of the location of deaths reveals that on average those catchment areas with the greatest population density experienced the greatest number of deaths between the years of 1970-1974. These facts are significant to EMS planning as they indicate where resources might most appropriately be applied for the greatest expected benefit to the population at risk.

Exhibit VI, following this page, will identify total deaths by village of residence on the Island for the years 1970-1974.

In brief, what is revealed is that residents of specific regions of the Island are experiencing more accidents per capita than others, and two regions are experiencing increasing

*Source: Office of Highway Safety, Comprehensive Plan 1976-1977, Page 55.

NUMBER OF VEHICLE ACCIDENTS BY HOUR OF THE DAY
FOR 1974




SOURCE: Annual Traffic
Analysis Report, 1974
Dept. of Public Safety
Government of Guam

------- 1972
..... 1973
_____ 1974

## DEATHS BY LOCATION

X = NUMBER OF DEATHS; Y = VILLAGE POPULATION

| | 1970 | | 1971 | | 1972 | | 1973 | | 1974 | | (JAN-AUG) 1975 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | X | Y | X | Y | X | Y | X | Y | X | Y |
| AGANA | 11 | 2,131 | 15 | 2,232 | 14 | 2,279 | 16 | 1,259 | 11 | 1,259 | 6 | |
| AGANA HEIGHTS | 11 | 3,258 | 12 | 3,376 | 17 | 3,465 | 26 | 4,075 | 16 | 4,075 | 19 | |
| AGAT | 27 | 4,441 | 28 | 4,582 | 17 | 4,267 | 31 | 8,821 | 25 | 13,000 | 17 | |
| ASAN | 8 | 2,997 | 4 | 3,047 | 14 | 3,116 | 11 | 2,146 | 16 | 2,146 | 9 | |
| BARRIGADA | 29 | 6,444 | 31 | 6,621 | 27 | 6,799 | 34 | 6,456 | 37 | 6,456 | 18 | |
| CHALEN PAGE/ORDAT | 18 | 2,940 | 12 | 3,038 | 13 | 3,132 | 15 | 3,209 | 18 | 3,209 | 6 | |
| DEDEDO | 32 | 10,910 | 34 | 11,279 | 51 | 11,774 | 59 | 16,000 | 69 | 15,000 | 48 | |
| INARAJAN | 10 | 1,990 | 15 | 2,050 | 10 | 2,122 | 17 | 2,484 | 16 | 2,000 | 7 | |
| MANGILAO | 12 | 3,214 | 16 | 3,323 | 17 | 3,472 | 15 | 6,000 | 17 | 6,000 | 14 | |
| MERIZO | 11 | 1,532 | 5 | 1,593 | 9 | 1,643 | 7 | 2,042 | 5 | 2,042 | 5 | |
| MONGMONG/TOTO/MAITE | 12 | 6,503 | 20 | 6,604 | 23 | 6,782 | 28 | 3,177 | 24 | 3,177 | 16 | |
| PITI | 15 | 1,289 | 16 | 1,327 | 11 | 1,369 | 6 | 1,463 | 8 | 1,256 | 7 | |
| SANTA RITA | 11 | 8,732 | 12 | 8,809 | 16 | 8,893 | 15 | 4,096 | 19 | 4,094 | 11 | |
| SINAJANA | 16 | 3,537 | 24 | 3,643 | 30 | 3,735 | 18 | 5,000 | 21 | 6,000 | 13 | |
| TALOFOFO | 10 | 1,976 | 10 | 2,037 | 9 | 2,104 | 7 | 1,965 | 10 | 1,965 | 5 | |
| TAMUNING/TUMON | 34 | 10,711 | 29 | 10,993 | 39 | 11,262 | 47 | 16,340 | 51 | 16,340 | 28 | |
| UMATAC | 4 | 814 | 6 | 840 | 7 | 869 | 7 | 1,222 | 4 | 1,222 | 2 | |
| JIGO | 6 | 10,825 | 10 | 10,911 | 13 | 11,002 | 14 | 4,300 | 12 | 4,300 | 12 | |
| YONA | 12 | 2,652 | 15 | 2,737 | 14 | 2,827 | 17 | 3,000 | 17 | 3,000 | 8 | |
| TOTAL = a | a | b | a | b | a | b | a | b | a | b | a | b |
| PERCENT = b | 355 | 4.1 | 364 | 4.1 | 409 | 4.5 | 435 | 4.7 | 449 | 4.7 | 295 | |

SOURCE:
Statistical Report, Office Of Vital Statistics, For The Years, 1970, 71, 72, 73, 74, 75 (JAN-AUG)

1970 n/a
1971 n/a
1972 p 40
1973 p 44
1974 p 44
1975 n/a

SOURCE:
Reallocated to the "usual residence" of deceased

1970 p 29
1971 p 30
1972 p 28
1973 p 31
1974 p 31
1975 monthly report JAN-AUG

EXHIBIT VI

death rates in the face of decreasing populations. Death statistics in these two areas, the South Central and Northern regions must be studied to determine the causes of this situation. Information as to the type and place of death by region must be accumulated to enable EMS planners to determine if medical services can be planned to minimize this problem.

(10) Types of Accidental Deaths

Accidental deaths are a significant cause of death on the Guam. Exhibit VII, on the following page identifies accidental death classifications and indicates what the cause of accidental deaths in the years 1970 through 1974 were.

It was discovered that motor vehicle deaths were the greatest single cause of accidental deaths on the Island between the years of 1970 through 1974. It is significant to note, as is demonstrated in Exhibit VIII, that motor vehicles licensed between the years of 1970 through 1974 were also increasing, but at an even faster rate. Thus, it is likely that motor vehicles will continue to be a major cause of accidental deaths, and therefore is an area that must be contended with in the development of an EMS plan.

The greatest number of accidents in the years 1972 through 1974 were the result of collisions between automobiles. In 1974 they alone were responsible for 67% of all vehicle related accidents; in 1973, 66% and in 1972, 65%.

Vehicle accident information by age of driver for the years 1972 - 1974 appears in Exhibit IX. This information demonstrates which age group either caused or was the victim of the greatest number of vehicle accidents. The value of such statistics to EMS planning is in identifying for the proper authorities the age groups that must be educated to safe driving procedures. This recommendation alone might assist in easing the vehicle accident burden on the EMS system.

(11) The Leading Causes of Death

Perhaps most significant to the planning of an EMS system is the recognition of the type of health maladies that are actually killing people on Guam. The two most frequent killers of greatest relevance to an EMS plan are diseases of the heart and motor vehicle accidents which together killed 30% of all those dying on the Island in 1974.

It is believed that an EMS system adequately prepared to attend to these problems can play a major role either in minimizing these problems, or in reducing the number of deaths associated with them.

In summary, this section has discussed the population characteristics on the Island of Guam. The specific areas discussed included the size, projections, composition, employment, education, accident and death statistics for the population. More study will be required to understand how these factors affect patient volume and emergency medical service resources.

## 3. TRANSPORTATION CHARACTERISTICS

This section will describe the transportation characteristics of the islands emergency transport system. The specific areas to be discussed will include the road conditions, the public transportation system, emergency transport, ambulance coverage, the equipment on the vehicles, and the emergency vehicle's communications capabilities. All of the above issues will be independently discussed for the civilian and military system.

(1) Road Conditions

In general, road conditions throughout the island are poor causing a number of problems significant to the development of an EMS plan. The poor road conditions cause accidents

ACCIDENTAL DEATHS BY TYPE
FOR THE YEARS 1970 - 1974

| ACCIDENTIAL DEATHS TYPE | YEAR | | | | | |
|---|---|---|---|---|---|---|
| | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
| MOTOR VEHICLE | 22 | 39 | 36 | 43 | 25 | |
| WATER TPANSPORT | | | 5 | - | - | |
| AIR AND SPACE TRANSPORT | | | 4 | - | 6 | |
| POISONING | | | 0 | - | - | |
| FALLS | | | 6 | 4 | 6 | |
| FIRE AND FLAMES | | | 2 | - | - | |
| NATURE AND ENVIRONMENT | | | 0 | - | - | |
| DROWNING | | | 7 | 8 | 14 | |
| SUFFOCIATION (FOOD/OTHER) | | | 2 | 7 | 4 | |
| MECHANICAL SUFFOCATION | | | 2 | 3 | 3 | |
| HIT BY OBJECT | | | 2 | 1 | - | |
| FIREARM MISSLES | | | 0 | 1 | 1 | |
| ELECTRIC CURRENT | | | 2 | 4 | 1 | |
| MACHINERY | | | 0 | 1 | | |
| OTHER TYPES | 11 | 15 | 1 | 2 | 3 | |
| TOTAL | | | 69 | 74 | 63 | |
| AUTO-AUTO | | 14 | 16 | 14 | 4 | |
| AUTO-PEDESTRIAN | | 13 | 6 | 4 | 6 | |
| AUTO-MOTORCYCLE | | 4 | 0 | 0 | 1 | |
| AUTO-OBJECT | | 3 | 2 | 0 | - | |
| FALL OFF MOVING VEHICLE | | 1 | 0 | 1 | - | |
| NON-COLLISION, LOSS OF CONTROL | | 1 | 4 | 6 | 3 | |
| OTHER COLLISION | | | 0 | 4 | 3 | |
| MOTOR VEHICLE TRAFFICE ACCIDENTS | | | 1 | 9 | 3 | |
| TOTAL | | | 29 | 38 | 20 | |

NUMBER OF MOTOR VEHICLES LICENSED ON GUAM

FY 1964 - 1974

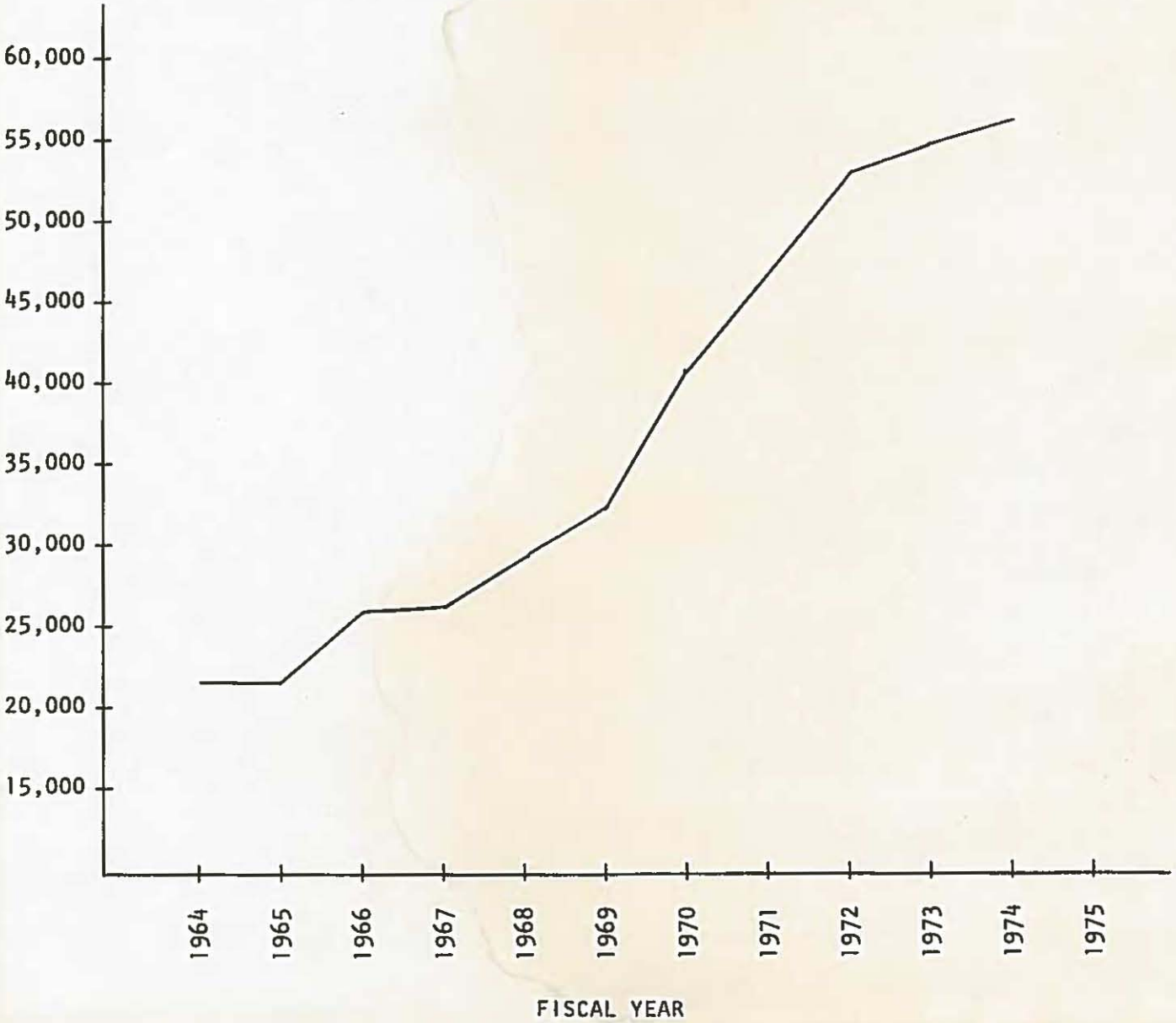



EXHIBIT VIII

VEHICLE ACCIDENTS
BY AGE OF DRIVER FOR THE
YEARS 1972-1974

| AGE OF DRIVERS | YEAR | | |
|---|---|---|---|
| | 1972 | 1973 | 1974 |
| 16 | 138 | 127 | 70 |
| 17-20 | 1,339 | 1,130 | 1,152 |
| 21-24 | 1,511 | 1,230 | 1,326 |
| 25-34 | 2,020 | 2,014 | 2,104 |
| 35-44 | 1,089 | 1,338 | 1,507 |
| 45-54 | 699 | 661 | 846 |
| 55+ | 278 | 422 | 414 |
| NA | - | - | 65 |
| TOTALS | 7,074 | 6,922 | 7,484 |

Source: Department of Public Safety, 1974.

and require slower speeds lengthens travel times between relatively short distances. Inclimate weather further complicates these problems as vehicle accidents become more frequent, and travel time becomes even greater as vehicle speeds must be reduced. The southern portion of the Island has greater exposure to these problems than the north. As indicated earlier the roads are generally not as well constructed and their terrain more difficult than in the north.

(2) The Public Transportation System

Guam has no public transportation system and consequently most islanders own their own vehicles. Those who do not have their own means of transportation either use rentals or taxicabs. The problems attendant with Guam not having any public transportation lies in the fact that the roads will become more congested with traffic, thus increasing the probability of accidents. Further, many one-car families lack access to medical care when the head of the household uses the car for transportation to and from work.

(3) Emergency Transport

The only types of ground emergency vehicles available are ambulances. Currently five are operated by the Department of Public Safety's Fire Division, and nine are operated by the Armed Forces, who assist the civilian community as necessary.

The Armed Forces also use their helicopters for emergency air transportation, particularly when accidents occur in areas that are not readily accessible by land. In addition, air vehicles are fundamental to inter-island transport, and necessary for the evacuation of critical care patients.

The Department of Public Safety owns a harbor patrol boat which is utilized in emergencies at sea. Supporting the harbor patrol boat is a Navy crash boat used for sea rescue.

The Armed Forces are a significant component in the islands ability to handle emergencies at sea, to service water recreation areas, and to reach areas inaccessable by conventional ground vehicles.

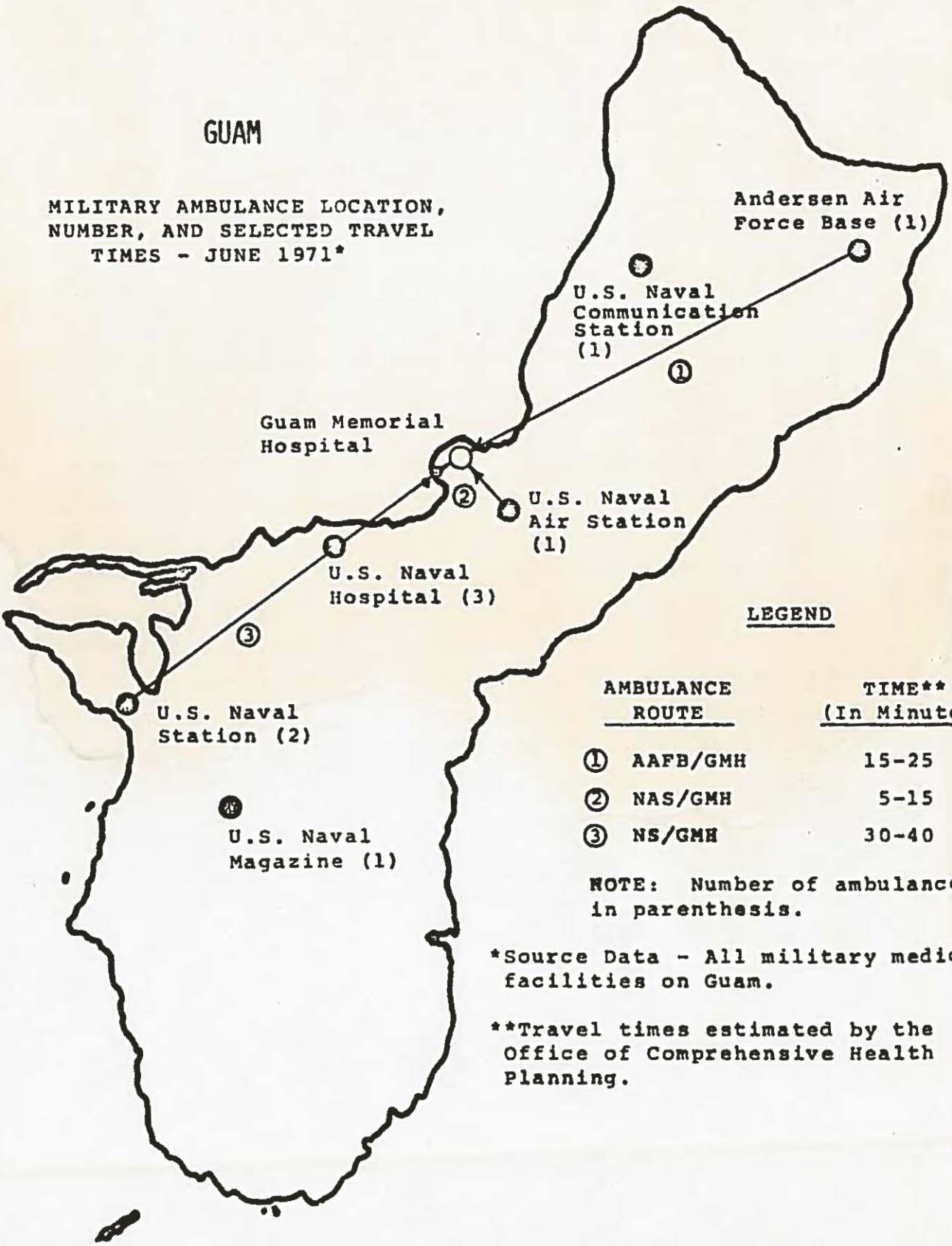
(4) Ambulance Coverage

Location and Coverage of Military Ambulances: Military ambulances are operated by the various Naval and Air Force commands throughout the Island. Even though presently there is no formal instruction, the ambulances still respond to calls where needed, and it is usually in somewhat close proximity to where they are stationed. Exhibit X, following this page, depicts the location of military ambulances on Guam and their travel times to GMH. The military ambulances provide emergency service to military personnel and their dependents on the base and surrounding areas. Military ambulances also respond to calls where civilians are in need of emergency transportation. It is difficult to accurately estimate the total population served by each command. However, the nine ambulances are responsible for serving approximately 50,000 persons. This would include military personnel and their dependents, and certain eligible civilians. Of course, since the ambulances respond to all calls, the actual number that they serve is far greater.

Location and Coverage of Public Ambulances: There are seven operational fire stations which offer 24 hour fire-fighting services. Ambulance service is operated out of five of the seven. Exhibit XI, following this page, shows these five ambulance stations, (Medics 1, 3, 4, 5, 6) and their areas of responsibility. There is only one back-up ambulance.

# GUAM

MILITARY AMBULANCE LOCATION, NUMBER, AND SELECTED TRAVEL TIMES - JUNE 1971*




LEGEND

| AMBULANCE ROUTE | | TIME** (In Minutes) |
|---|---|---|
| ① | AAFB/GMH | 15-25 |
| ② | NAS/GMH | 5-15 |
| ③ | NS/GMH | 30-40 |

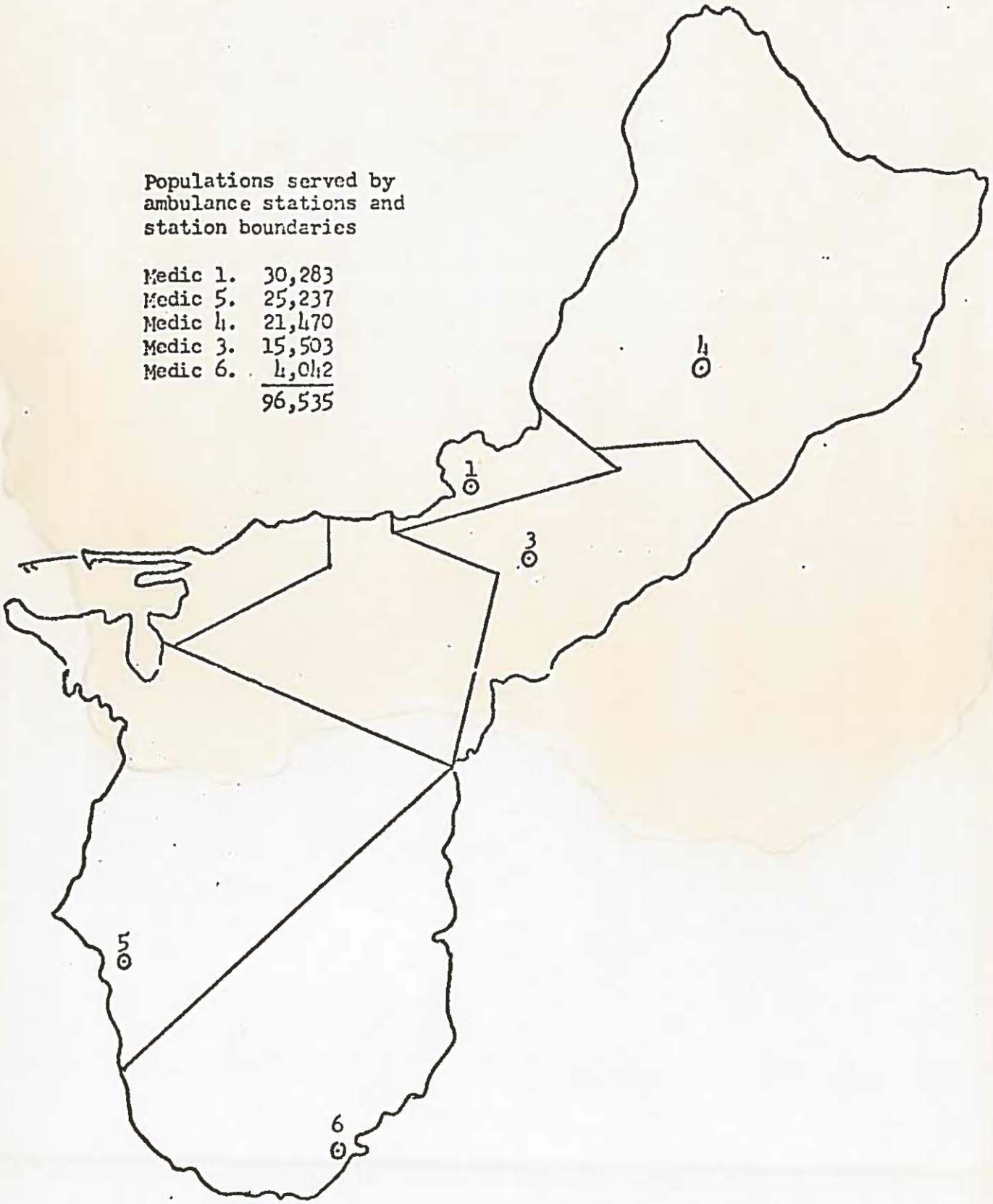
NOTE: Number of ambulances in parenthesis.

*Source Data - All military medical facilities on Guam.

**Travel times estimated by the Office of Comprehensive Health Planning.

Populations served by ambulance stations and station boundaries

| | |
|---|---|
| Medic 1. | 30,283 |
| Medic 5. | 25,237 |
| Medic 4. | 21,470 |
| Medic 3. | 15,503 |
| Medic 6. | 4,042 |
| | 96,535 |



A new fire station was completed in November 1974 in Piti. An ambulance service is planned for this station when one becomes available.

Ambulance service is provided by the Government of Guam to anyone who asks. Patients are later billed a nominal fee. The ambulance service is operated by the Fire Operations Bureau of the Department of Public Safety.

Ambulance Utilization: Utilization of the ambulance falls under two broad categories--emergency runs and non-emergency runs. Non-emergency runs can be defined as those requiring no first aid treatment by ambulance personnel. The greatest percentage of non-emergency runs include transportation service for routine medical appointment. This type of non-emergency use is most prevalent in the rural area of Inarajan. The proportion of the population that use the ambulance service is 7% in Inarajan; nearly twice that of Tamuning and triple that of Agat and Dededo.

The number of emergency/non-emergency runs has not been recorded since 1971. The Fire Operations Bureau estimates the number of actual emergencies handled are 20 to 30% of total runs made. For non-emergent situations, this would mean mainly taking patients to hospital or clinics for appointments.

Data was collected on the number of emergent and non-emergent runs to GMH. Analysis of the GMH data reveals the number of actual emergencies to the total ambulance runs is between 40 to 50 percent. Out of the GMH data the total number of patients arriving by ambulance was 1383 in 1973. This figure divided by the total number of runs made, as reported by DPS for the same period, 2750 equals 50%. A similar time frame was compared for FY 1974 and 40% of the runs were determined to be non-emergent.

Response Time: For purposes of this paper, a rapid response time is defined as five minutes or less from the time the ambulance is called until it arrives on the scene.

Except for those emergency cases which occur on or near the hospital, response time by the ambulance is estimated to be well beyond ten to fifteen minutes if transport to the hospital is included. Further, it should be kept in mind that the areas of rapid response have been drawn assuming normal conditions. This time is dramatically increased during rains and rush hours; sometimes by as much as 50%.

Beyond Rapid Response: There are an estimated 35,321 people, or 36% of the 96,535 civilian population that live outside the areas of rapid response. Some areas such as, portions of Yigo, all of Yona, Piti, Talofofo-Ipan, Umatac, and Merizo are 15 to 20 minutes or more from emergency medical assistance. The populations beyond rapid response are:

| | |
|---|---|
| Nearly all of Yigo | 3694 |
| Northern Dededo area and the Barrigada area along Route 15, plus Mangilao, Chalan Pago and Ordot | 6550 |
| Portion of Agana | 3475 |
| Sinajana | 5100 |
| All of Yona | 3000 |
| All of Azan | 2146 |
| All of Piti | 1250 |
| All of Talofofo-Ipan, the north-eastern area of Santa Rita, and Cron Island Road | 2875 |
| Southernmost area of Agat | 300 |
| All of Umatac | 1222 |
| All of Merizo | 2042 |
| | 35321 |

The above estimates do not include the recently opened Baza Gardens project north of Talofofo. This will represent a potential shift in population of approximately 4050. When considering that (1) no stabilizing treatment other than fundamental first aid is given to patients, (2) the patient must wait until arrival at a hospital emergency room for definitive care, (3) Guam is rural and has very few street names or numbers for ease of identification, and (4) reliable telephone service is available to a fortunate few, this 36.58% of the population that are beyond rapid response is ample reason for major changes and improvements in the available emergency service on Guam.

Military Services: The population served by the NRMC and its ambulance is approximately 30,000 people. Not counted in the 24,301 military personnel shown below are all transient personnel, the 1,000 men attached to the U.S.S. Proteus, and other small detachments. Military populations are:

| | |
|---|---|
| AAFB | 5,500 |
| NCS | 3,900 |
| Wilson Housing (Air Force) | 1,300 |
| NAS | 2,919 |
| Nimitz Hill | 601 |
| NRMC (Navy Hospital) | 406 |
| Navsta | 9,472 |
| NavMag | 203 |
| TOTAL | 24,301 |

As can be seen in Exhibit XII, following this page, DPS ambulances average 27 deliveries/month to NRMC. There is an informal policy that allows DPS to take a critically ill or injured patient to NRMC if it is closer than GMH.

(5) Equipment on the Vehicles

. Civilian System

Presently the Department of Public Safety operates five emergency vehicles. The vehicles are equipped with two way radios which are operated as part of the island wide Police and Fire radio system. Medical equipment on the vehicles is limited, as they lack the appropriate first aid machinery. Complicating this problem are mechanical difficulties caused by the weather and terrain, which plague even the best of vehicles on Guam.

. Military System

The Navy and Air Force use standard sedan type ambulances that are equipped to render emergency medical care, and for two way communications with NRMC. Since early February the military ambulances have had two way communication with GMH.

(6) Ambulance Communication Capabilities

. Civilian System

The Department of Public Safety utilizes the local telephone system, and a direct line from the Tamuning station to Guam Memorial Hospital.

There is no direct two way radio communication among the stations at Agat, Inarajan, and Tamuning, and there is no communication with the military facilities or their ambulances.

Two-way communication between dispatcher and the ambulances is available, but not between the hospital and the ambulances.

. Military System

The military utilizes a local phone system as well as two way radio communication. All military ambulances and facilities are equipped for two way radio communication. Although there is no central communication or dispatch center, the ambulances can communicate with one another and the US Naval Hospital.

# GOVERNMENT OF GUAM
# OFFICE OF COMPREHENSIVE HEALTH PLANNING
# EMERGENCY MEDICAL SERVICES PLAN

Office of Comprehensive Health Planning

1976

# NAVAL REGIONAL MEDICAL CENTER
## AMBULANCE ACTIVITY FROM
## DECEMBER, 1973 to SEPTEMBER, 1974

| DESCRIPTION | MONTHLY AVERAGE | TOTAL # CASES |
|---|---|---|
| . Number of runs made by the 5 NRMC ambulances | 50 | |
| . Number of deliveries by DPS ambulances | 27 | |
| . Total ambulance deliveries | 86 | |
| . Ambulance delivered patients admitted | 47% | |
| . Deliveries related to traffic accidents | 26% | |
| . Arrived by private vehicle | | 54 |
| . Auto accident patients | | 183 |
| . Cardio vascular patients | | 36 |
| . Rape or sexual assault patients | | 9 |
| . Drug overdose patients | | 36 |
| . Shooting, stabbing, or other assault patients | | 16 |
| . Suicides | | 4 |
| . Dead on arrival | | 20 |

(7) Summary

This section has discussed the transportation system in Guam identifying those characteristics that will have the greatest impact on the effectiveness of the EMS plan.

Inventory: Collectively, the military operates nine ambulances on Guam. There are three stationed at the U.S. Naval Hospital, two at the U.S. Naval Station, one at the Naval Magazine, one located at the Naval Air Station, the Naval Communication Station has one vehicle, and one ambulance is based at the Anderson Air Force Base.

There are seven operational Gov. Guam fire stations which offer 24 hour fire-fighting services. Ambulance service is operated out of five of the seven stations.

A new fire station was completed in November, 1974 in Piti. An ambulance service is planned for this station by mid 1976.

The absence of an adequate communication network between GMH and the ambulances on Guam is a major defect in the existing transportation system. Although the ambulances are inadequately equipped, they are satisfactory given the existing level of service provided by the attendants. However, expanding the level of training of ambulance attendants will require an upgrading in equipment and supplies on the ambulances.

## 4. HEALTH CARE DELIVERY SYSTEM CHARACTERISTICS

This section will describe the health care delivery system characteristics of Guam through a discussion of the Islands two major health care systems, the civilian system and the military system. The areas in each system to be discussed include manpower, financing, facilities and services.

The objective in describing the current health care delivery system is to understand the geographic distribution of the systems resources, and to determine the resources necessary to supplement existing deficiencies. This will assure an EMS plan capable of being effective when implemented.

(1) An Overview

Guam has a pluralistic health care delivery system containing public, private and military medical services. The public services are characterized by Guam Memorial Hospital, the Fire Division's ambulance service, and public health and social services. The private services consist of physicians, dentists, optometrists, multi-specialty medical groups, and pharmacies. The military services consist of a hospital, outpatient facilities, ambulances, and a broad range of specialist and clinics. Thus Guam's health care is delivered by two distinguishable systems;

. The civilian system, comprised of a public and private component; and

. The United States military component.

These two components are designed to serve two distinct population groups. The civilian system generally serving the civilian population, and the United States military system generally serving the military population.

(2) The Civilian System

The civilian population is served by a public health system and a private health system. The two systems operate interdependently on several levels. However, for purposes of this study only two levels will be reviewed from this interdependent perspective. They are manpower and financing. The services offered by the public agencies and the private practices are reviewed as two additional sub-sections to this chapter.

. Manpower

The 1975 survey of health manpower conducted by the Office of CHP, showed that Guam had 84 physicians. Seventy-nine are active in patient care and 75 have privileges at GMH. GMH has a staff physician on duty during the day at the emergency room. A private physician from the Health Maintenance Clinic (HMC) group goes on duty at night. HMC is a third party payor. The majority of physicians in private practice are under HMC at the present time. In addition to the on-duty emergency room physician, the specialist "on-call" list provides the ER physician consultation when a specialist is needed.

According to the health manpower survey conducted in February 1975, Guam has a total of 228 R.N.'s and 43 L.P.N.'s. Of a total of 271 R.N.'s and L.P.N.'s, 13 are instructional nurses, 37 are Department of Education (DOE) school health counselors, and 12 are administrators. The rest are active in patient care. DOE school health counselors do provide limited patient care.

Naval Regional Medical Center Manpower in the emergency room is manned after hours by an on-call physician. There is a petty officer in charge, ambulance attendant and driver, and two emergency room technicians.

To support emergency services there are also technicians available for the laboratory, radiology, cast room, inhalation therapy, and operating room. In addition to the normal watches a nurse practitioner is on duty during weekends. The nurse practitioner has special training and performs diagnostic and definitive treatment of a level similar to that of a physician's assistant.

. Financing

The Government of Guam finances medical services through revenue taxes, fees for service from patients or third party reimbursement. Payments within the private sector are primarily paid by patients or through third party reimbursement arrangements.

There are many established programs that qualified patients may use to pay for health care services. These programs include:

- private indemnity health insurance programs;
- medicaid
- medicare

- workman's compensation

- special government programs providing care for TB, Parkinson's disease, and diabetes.

In addition, the government provides free services through the Department of Public Health and Social Services to those who cannot pay for their own health care, or do not qualify for any of the supplementary income programs.

Facilities and Services

The government of Guam provides the necessary services to the civilian population through Guam Memorial Hospital (GMH). This facility is a 242 bed acute care hospital providing a full range of services in addition to inpatient and outpatient mental health services, medical outpatient services, and extended care services for tuberculosis and geriatric patients.

Through the Department of Public Health and Social Services, the government provides preventive medical and dental care, health education, large scale diagnosis and treatment programs in the areas of communicable diseases, maternal and child health, chronic diseases, and children's dental health. The Department conducts its programs through a network composed of one areawide and twelve village health centers located around the Island.

Additionally, the University of Guam and the Department of Education jointly operate a school nurse program, rehabilitative program, and provide medical manpower training programs.

Private Sector

The private sector provides primary and specialty medical services typically through its outpatient medical practices and hospital based services. Outpatient services are presently offered by two multi-specialty medical groups, one specialty group, and ten solo-practitioners.

The private sector confines itself to the Agana, Tamuning, Harmon "medical care corridor". The result being that the relatively less populated southern portion of the island remains isolated from the hub of medical care on Guam.

## (3) The Military System

### . Manpower

The military has stationed on Guam a total of fifty-four physicians, eight of which are Air Force physicians, while the remainder are affiliated with the Navy. They are located throughout the island at various outpatient facilities and at the U.S. Naval Hospital.

This figure highlights the fact that the majority of military physicians are located in the northern and central regions of the island, once again leaving the southern region without physicians.

Specialists typically function at the center of the system, i.e., the hospital, while the general practitioners and supportive para-professionals typically staff the outlying clinics. There are advantages to this type of arrangement in terms of reducing increasing costs, and improving efficiency and accessability.

Although we were not provided any information regarding the military's utilization of registered nurses or other associated nursing personnel, we do know that they rely in a major way on medical corpsman both as support and substitute personnel to the medical profession.

Of the 131 Corpsman available 69% are located at the Naval Regional Medical Center, while the remainder are at other military sites throughout the island.

### . Financing

With few exceptions there is no charge for medical services within the military health care delivery system. The services rendered are paid for through the Federal Governments general revenue taxes. For those who must seek services outside of the military health care system, the military provides a medical insurance program (CHAMPUS), which reimburses the civilian provides for services utilized by eligible military personnel.

### . Facilities and Services

The military health care delivery system is centrally organized through the United States Naval Hospital. The Naval Hospital is an acute care facility providing a full range of inpatient services, outpatient services, ambulances, and air/sea rescue services.

Figure 5, following this page, identifies the location of the military's medical facilities on Guam. Unlike their civilian counterpart, the military component of the health care delivery system does not operate community-wide programs.

(4) Other Information:

Both the Guam Memorial Hospital and the United States Naval Hospital are equipped to provide emergency care. However, with the exception of the existing intensive care wards, Guam Memorial Hospital does not have any specialized critical care units. Both hospitals will accept emergency cases regardless of the patient's financial status. If a civilian is admitted to the Naval Hospital for emergency care, treatment is rendered and the patient is transferred to the civilian facility after their condition is stabilized.

The Department of Defense and the Department of the Interior have agreed that patients from the Trust Territory will be provided medical services by the Naval Hospital in those cases where Guam Memorial Hospital can not provide services.

In addition, the Department of Public Health and Social Services has arrangements to Queen's Medical Center in Honolulu, Hawaii to refer patients when necessary.

5. SUMMARY

This section has discussed those characteristics of Guam's health care delivery system which are pertinent to the development of an EMS plan. The following chapter will describe a conceptual model of the emergency medical system and how the EMS Plan has been designed.

# III. OVERVIEW OF THE EMS SYSTEM

# III. OVERVIEW OF THE EMS SYSTEM

This chapter is designed to give the reader a basic understanding and appreciation for the Emergency Medical Service (EMS) system as it is perceived from a planners perspective. In this chapter we provide a review of the basic characteristics of the EMS system and how they are interrelated with other components of the health system. This will provide a common basis for a more specific discussion of the technical approach utilized in the Guam EMS Plan. There are a variety of methods available for describing the Emergency Medical System. One method is to view the system as a pyramid. Exhibit XIII, following this page, depicts this conceptualization. The left side of the pyramid represents the two levels of care (Advanced Life Support and Basic Life Support) defined in the Federal EMSS Guidelines. The right side of the pyramid represents the fifteen components defined in the EMSS Guidelines as well as two additional components (Legislation and EMS Systems Management) which affect both levels of care. For purposes of this plan, the seventeen components will provide a means by which their impact upon services can be described.

This chapter is divided into three sections. The first section consists of a review of the organization of Emergency Medical Services. The second section describes the components affecting Emergency Medical Services. The third section deals with the organization of the Emergency Medical Service Plan.

## 1. ORGANIZATION OF THE EMERGENCY MEDICAL SERVICES

Utilizing Exhibit XIII as the reference, the organization of Emergency Medical Services can be described as two levels of care, i.e., Advanced Life Support and Basic Life Support. These levels of care are defined in the Federal EMSS Guidelines. Each level of care represents a different range and complexity of services. Further, the technical support required to deliver

Emergency Medical Services differs for each level. To clarify this point, Basic Life Support will be defined as:

The entrance point into the EMS system. It is that care given at the patient's first point of contact with medical intervention. Emergency medical services given at the primary level represents preventive services such as awareness of commonly occurring medical emergencies, recognition of the need for emergency care, providing initial care until more highly trained personnel arrive, initiating EMS system response and rendering basic life support and cardiopulmonary resuscitation. The basic life support level encompasses first aid procedures that consist of the recognition of airway obstruction, respiratory and cardiac arrest, and, for those trained, the proper application of cardiopulmonary resuscitation (CPR).

For the purpose of the plan Basic Life Support will consist of:

- EMT-A
- Advanced First Aid/CPR
- First Aid

Advanced Life Support is defined as:

Health care which represents an entire continuum of preventive, diagnostic, treatment and rehabilitative services for the acutely ill patient as well as specialized services for patients with complicated and catastrophic injuries. A.L.S. includes highly sophisticated diagnostic and therapeutic procedures such as severe burn treatment, and major hospital trauma emergency department services. A.L.S. care facilities consist of university hospitals, county hospitals and large medical centers. This type of facility is capable of meeting special requirements to support training and teaching programs. Specialty services and technical equipment, to attract professional manpower is also available.

Patients are usually referred for highly specialized services either because the injury is difficult to diagnose or treat, or the manpower and technical resources available to treat the injury are relatively scarce and/or expensive.

Advanced Life Support includes:

- Burn Care
- New Born Intensive Care

THE EMERGENCY MEDICAL SERVICE SYSTEM

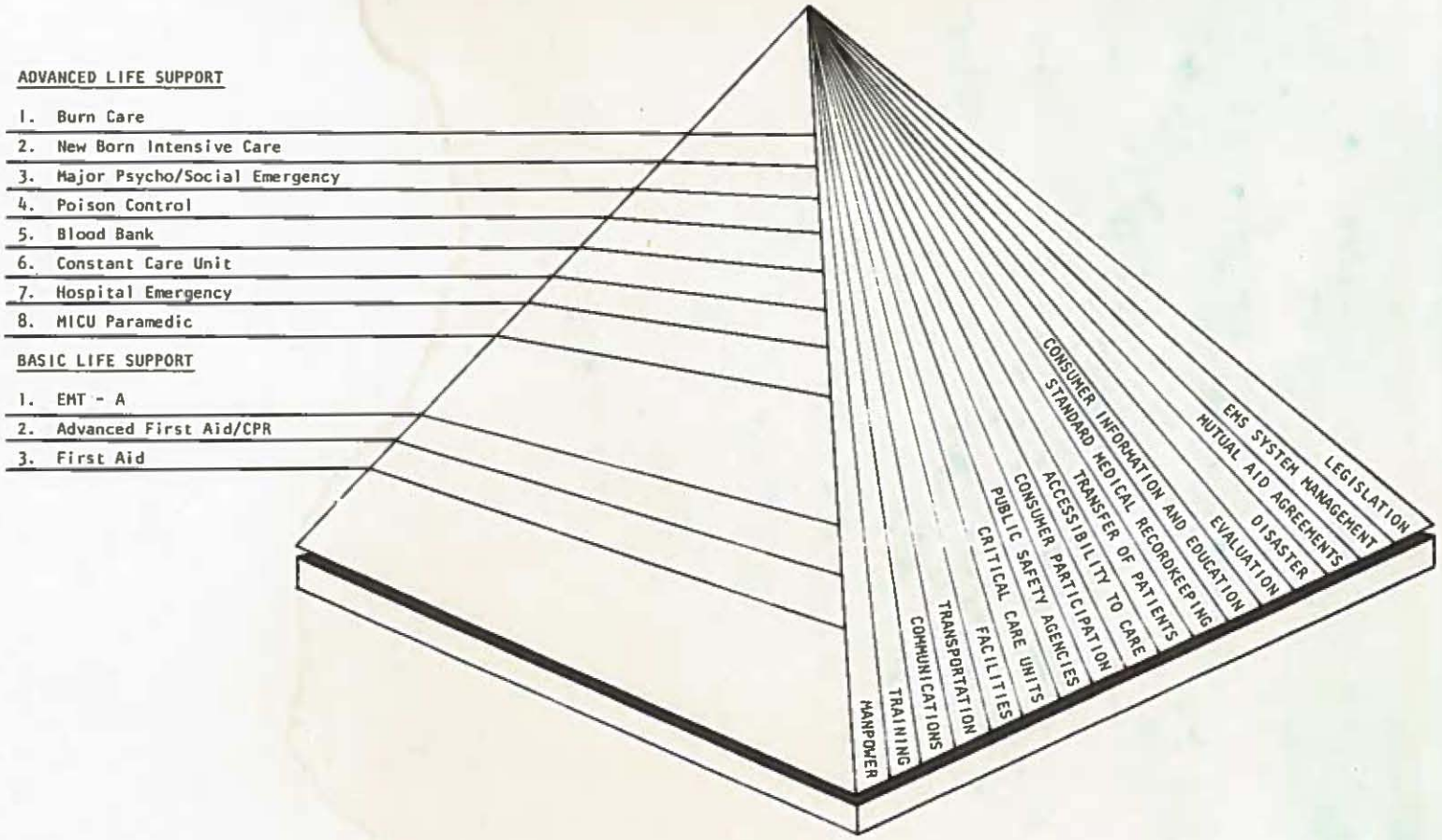



EXHIBIT XIII

- Major Psycho/Social Care
- Poison Control
- Blood Bank
- Constant Care Unit
- Trauma Center
- Hospital Emergency
- Mobile Intensive Care Unit (MICU) Paramedic.

The two levels of care appear to have discrete and separate medical purposes; however, some of the features of each are closely related to the other and comprise a full set of services necessary for the delivery of comprehensive emergency medical care.

The services described under each level of care were selected by the Ad Hoc EMS Advisory Committee on the bases of their significance to the delivery of Emergency Medical Services.

In selecting the specific services to be placed in each category they must be evaluated against the criteria described above. For those services which do meet the criteria of a specific level of care, they are assigned to that category. Because the health care industry is experiencing a number of changes as well as expanding the number of services, we expect to add or change services as the plan is developed over the years.

## 2. COMPONENTS AFFECTING EMERGENCY MEDICAL SERVICES

The fifteen components stated in the EMSS Guidelines and the two additional components also identified as impacting upon emergency medical services are defined below. The seventeen components affect the delivery, quantity and accessibility of emergency medical services. From a planning perspective these components are being defined as such to assist in the analysis of the EMS system.

Manpower

For our purposes this factor means manpower utilized in the EMS system. This would include emergency physicians, specialty nurses, emergency and critical care nurses, EMS ambulance personnel and EMT-paramedics, central dispatchers, telephonic screeners, first aid respirators and EMS system coordinators. In this component the plan will explore the type, location, and utilization of manpower associated with each of the services.

Training

This factor relates to training and continuing education programs including all personnel within the EMS system. Programs will be identified as to whether they are continuing education, residency education, training for critical care nurses, training for all levels of EMT's, training for first responders or other associated personnel. Aspects to be considered are necessary resources, adequacy of evaluation and the reassessment process, cost and, if possible, frequency and location of courses offered.

Communications

The communication system includes access, dispatch, medical consultation, linkages between ambulances, emergency medical technicians, hospitals and other public safety personnel. The communication system must be able to support the medical requirements of the EMS system as well as link the appropriate services for a disaster situation. The engineering of the total communication system is another aspect of this factor which is considered. The manpower required to meet the service needs of the system will also be considered.

Transportation

This factor consists of the different types of ground, air and water transportation available for primary and secondary response problems. Further, the various categories of emergency vehicles are to be coordinated within the total system. Other aspects to be considered are centralized command control, service to recreational and inaccessible areas and the replacement of vehicles.

Facilities

For our purposes this factor consists of an identification of health facilities in the area. This will include hospitals, clinics and mental health centers. A description of each facility including their services,

patient volume, number of emergency cases and the staffing patterns of the emergency department.

. Access to Critical Care Units

This factor consists of an identification of the kinds, location, numbers and service categories of the critical care units in the region. The critical care units to be considered will include trauma, burns, plastic surgery and blood. Although not all critical care facilities are available in the EMS planning area, this element does review those for which services are being provided.

. Public Safety Agencies

Public safety agencies are involved at the Basic Life Support level in the EMS system. They are concerned with communication and transportation capability which affect the emergent patient. A description of how interfacing occurs with these agencies is provided.

. Consumer Participation

For our purposes this factor consists of describing those individuals who use or may have need of the EMS system. This section will describe how provision for consumer participation in determining system policy has been utilized in plan development and continued operation of the EMS system.

. Accessibility to Care Without Ability to Pay

This factor means does the system provide for the EMS patient who is unable to pay. A review of how the Government of Guam assures coverage of its citizens is provided.

. Provision for Transfer of Patients or Continuum of Care

This factor means the flow or referral of the patient through the various phases of the treatment process. This will include transportation and facilities. The location, capacity, type of patients, accessibility and criteria of care are elements of this factor.

. Standardized Medical Record Keeping

This factor means the specific information required and collected on emergency patients. What information is needed, such as, the time the emergency medical system was accessed, medical care dispatched and the treatment provided are examples of the information medical records can provide. Aside from the monitoring of the records

and assuring their accuracy, the planner must maintain the confidentiality of the patient's medical information.

. Consumer Information and Education

This factor includes information on how consumers can access the emergency medical system. It is anticipated that further information will be provided on the availability of emergency services; their location and how to determine what to do for specific injuries or medical emergencies. The planner will be concerned with the content, relevancy and coordination of the informative programs provided.

. Independent Evaluation

By this factor we mean to determine whether the specific goals were achieved. This will include an assessment of the management of the implementation of the EMS plan. The evaluation will measure process as well as impact of the patient care system utilized. Baseline data (or data elements) will be determined for each of the measurement criteria which will assess change. Data collection instruments will be developed based on the measurement criteria. Analysis of the data will be based on the measurement criteria and the purpose to which the information is to be used. Our evaluation will be designed to assess the systems impact upon the delivery of emergency medical services.

. Disaster Planning

This factor addresses the emergency medical services available during a disaster. This aspect of the plan must consider a systematic method to deliver emergency medical services during a disaster as well as the necessary modifications of the EMS system's routine procedures during a disaster. To be fully effective this means adequate non-telephonic communications are available, disaster information is available and accessible, and that necessary changes can be effected immediately. Finally, the disaster plan must be tested once each planning year.

. Mutual Aid Agreements

This factor means that this areawide EMS plan has been agreed upon; that capability, availability and location of the EMS resources have been determined; and that cooperative agreement has been established between military and off-island resources which assure jurisdiction and adequate financing.

. EMS System Management

This component was identified at our discretion and relates to the coordination, implementation and operation of this EMS plan. It will identify who has management responsibility of the EMS system and its components.

. Legislation

This factor has been included at our discretion because of the increased involvement of the federal, state and local governments in legislating programs, guidelines, standards and procedures which directly affect the design, implementation and operation of this plan. Included are a number of local laws which impact upon the plan's goals and expectations.

## 3. ORGANIZATION OF THE EMERGENCY MEDICAL SERVICE PLAN

The next two chapters consist of a description of Emergency Medical Services (Chapter IV) and an assessment of those services based on the seventeen components (Chapter V).

Chapter IV has been structured to follow a uniform format to describe each service. The services are arranged according to their level of care. The description of each service follows this format:

. Definition
. Current capacity
. Trends
. Criteria
. Summary

Thus, Chapter IV begins with:

1. Advanced Life Support - This is a level of care

(1) Burn Care - This is a service

. Definition - This is one of the descriptive sections for this service

The following is a brief discussion of each of the descriptive sections utilized in the format.

- Definition

  This contains a formal definition of each service. The definitions were developed from federal regulations, state laws and generally accepted professional concepts or terms descriptive of the service.

- Current Capacity

  This section will provide an inventory of services, and/or other significant information. Utilization levels are provided and where applicable these are related to the population of Guam. A description of the scope, and type of service is also provided.

- Trends

  The trends section describes the direction of future developments and functions that could affect the direction of services. This section will deal with national, state and local trends.

- Criteria

  This element will generally be based upon state or federal requirements. Further this element will establish parameters within which planning in the region should take place. It is anticipated that this element will change frequently as better criteria are developed.

- Summary

  This element will be a review of the main items considered above. The discussion in the summary will be based on the analysis of current capacity, trends and guidelines.

The following chapter will review the Emergency Medical Services provided in Advanced Life Support and Basic Life Support.

# IV. DESCRIPTION OF EMERGENCY MEDICAL SERVICES

## IV. DESCRIPTION OF EMERGENCY MEDICAL SERVICES

This chapter will describe each of the service elements of the emergency medical system. The service elements are divided into two broad categories. They are Advanced Life Support (A.L.S.) which consists of:

- Burn Care
- New Born Intensive Care
- Major Psycho/Social Emergency
- Poison Control
- Blood Bank
- Constant Care Unit
- Trauma Center
- Hospital Emergency Room
- MICU Paramedic

and Basic Life Support (B.L.S.) which consists of:

- EMT-A
- Advanced First Aid/CPR
- First Aid

The service elements are arranged to reflect levels of sophistication and the patient's point of entry. As indicated in Chapter III, it is believed that the majority of patients will enter through the basic life support services or the hospital emergency room. Thus, services are arrayed according to frequency of utilization and level of sophistication in equipment and manpower. Level of sophistication is the primary factor separating advanced from basic life support; however, entry into the system and utilization are key factors in distributing the service components.

The services described in this chapter are for the design of an Emergency Medical Services system. The Emergency Medical

Services discussed are to satisfy the EMS Plan development needs. The descriptions which follow will provide the reader with information concerning treatment and care of the emergent patient. The EMS Plan is not intended to describe nor to assess the other aspects of these medical services which deal with the non-emergent patient. That is the responsibility of a comprehensive health plan.

## 1. ADVANCED LIFE SUPPORT

Advanced Life Support consists of a full range of emergency medical services which require highly trained technical manpower and sophisticated medical equipment typically found in a hospital or medical center. The components of the Advanced Life Support services are reviewed below.

### (1) Burn Care

. Definition - Burn care is the treatment of severe burn patients typically in a specific area or room(s) of a hospital. Burn care can be classified as follows:

Burn Program--At this level, the hospital has no specialized facilities or areas for burn care. However, a consistent plan for management of burn patients is implemented by an interested and experienced physician (or jointly by several physicians). It is assumed that at least 25 burns per year are treated. Fewer than 25 burns per year would not permit the staff to develop and maintain sufficient expertise in burn care.

Burn Unit--This denotes a burn program being conducted in a specialized facility used only for burn care that has at least four beds and that treats at least 35 burn patients per year. A limited amount of research and teaching may be present on an intermittent basis.

Burn Center--This denotes a larger burn unit, with special emphasis on research and teaching as well as patient care. The facility provides very intensive burn patient care which requires the support of the research and teaching staffs. It is assumed that the facility has at least six beds, and that at least 50 patients with burns are treated there per year.

Generally, burn care facilities develop as a progression, starting with a burn program.

. Current Capacity - Burn cases are typically treated in the emergency room of Guam Memorial Hospital (GMH). Currently there are no burn beds at GMH. If the burns are diagnosed as serious and require hospitalization, the patient is admitted according to age and/or service, i.e., pediatric or surgery. Generally, the burn patient is isolated in the specific service area.

Since there is only one plastic surgeon on Guam, the Navy and Air Force, when necessary, transfer their burn patients to GMH for treatment and care.

. Trends - The National trend is toward more definitive analysis of burn cases so that categorization of facilities and services can allow for proper flow of burn patients to appropriate treatment. Through in-house training at GMH and NRMC burn patient treatment and triage is being reviewed with the staff. As this program continues, it is felt that burn victims can be treated more effectively. Further as more effective procedures for the treatment of burn victims are acquired by public safety ambulance attendants, victims can be treated more effectively at the scene of the accident.

. Criteria - The development of burn care services should be considered and evaluated in light of the providers' responsiveness to the following:

- Patients should be able to obtain the necessary care they need.

- Physicians should be able to obtain consultative services whenever necessary

- A burn center should have established communication patterns for consultation, referral and transport of patients

- Routine burn care should be available at the local level in emergency rooms, physicians' offices, hospitals and by ambulance attendants.

- Burn services should meet the established criteria of professional accreditation in burn care.

- Services should be coordinated between the hospital, physicians, consultants, and emergency rooms.

- There should be an established procedure for consultation, referral and transfer of patients.

- Ability to pay should not determine one's eligibility for service.

. Summary - The burn care provided on Guam is limited to a few cases each year and does not appear to be expanding to a level which would require a local burn program. The trend toward improving burn patient treatment skills of the paraprofessionals is appropriate given the situation on Guam.

(2) Newborn Intensive Care

. Definition - An intensive care newborn nursery service means the provision of comprehensive and intensive care for all contingencies of the newborn infant. A combination of specialized equipment and trained personnel provides maximum support of the newborn infant with major illness. Infant transport services are an indispensable part of an intensive care newborn nursery service.

. Current Capacity - Guam Memorial Hospital's nursery consists of three service sections: a large nursery, a premature nursery, and an isolation nursery. However, there is no intensive care nursery.

Utilization levels of infant emergency services are available from GMH. They are for the periods:

Jan. 1974 thru Dec. 1974 . . . . . 84 patients
Jan. 1975 thru June 1975 . . . . . 47 patients

This is the number of newborns using emergency services. The number of newborns requiring intensive care was not available from Guam Memorial Hospital Records.

The Naval Regional Medical Center has two (2) isolation units. There are three pediatricians in the unit. The nursing staff have combined responsibilities for both the OB and the nursery. NRMC has the only pediatric ICU transport capacity on the Island. This unit is shared with the civilian population.

. Trends - The maternal and child health program of GMH implemented its Intensive Infant Care Project in December, 1975. The project is designed to follow high risk babies from birth to one year. It is estimated that 120 babies will be seen every year.

. Criteria - The development of future newborn intensive care services should be considered and evaluated in light of the providers' responsiveness to the following:

- There should be a communication pattern for consultation, referral and transport of patients.

- Mothers and babies identified to be at risk should have the services of a regional perinatal center either through consultation or direct service.

- Mothers and babies identified to be at risk and needing hospitalization should have this available to them with adequate arrangements for transportation.

- The services should meet established criteria of professional accreditation.

- All levels of care should take into consideration the Psycho/Social needs of the patient/family as well as their physical needs.

- There should be an established procedure for consultation, referral and transfer of patients.

- The written procedures should be further supplemented by regular "Dry runs" to keep personnel abreast of what to do.

- A standard classification of perinatal high risk should be established for Guam.

. Summary - Although emergency service data is available, the number of newborn patients requiring intensive care is not available. It is difficult based on available data to plot any trend information concerning utilization or type of emergent situations. A more comprehensive data system is necessary to describe the existing services and plot trends.

(3) Major Psycho/Social Emergency

. Definition - Major psycho/social emergency is a situation which involves an emotionally ill and/or mentally disturbed child, adult or family. This will include potential suicides and emergencies resulting from drug abuse and alcohol misuse.

. Current Capacity - Psycho/social services are available through the Emergency Department of Guam Memorial Hospital. Emergency treatment, however, is provided by the Community Mental Health Center, which is located next to GMH. The following is a tabulation of the total number of emergency patients diagnosed with a psycho/social emergency condition:

- Training referral and coordination with Project Help, a community coordination referral and drop-in program

- Consultation and training for GMH, outpatient Department and Emergency staffs

- Submission of application to FDA for Methadone Treatment Program.*

- Submission of contract for IDARP reporting system

- Support and referral for Alcoholics Anonymous

- Provide back-up and caseload consultation to Mental Health staff in treating clients with drug or alcohol related problems

- Long-range plans include developing a community education program, utilizing printed materials and TV media, in conjunction with other agencies and Mental Health Center, Consultation and Education Section

- Conduct in conjunction with the Territorial Crime Commission Drug Problems Task Force a data and perspective program on substance abuse for Government of Guam officials, community leaders and village commissioners.

-. Take education initiatives to policy maker whenever possible

- Broadening the scope of substance abuse prevention to include prescription drugs, especially in combination with alcohol

- Continue substantial investment of coordinators resources to development of a sound Division staff structure

. Criteria - The development of future psycho/social emergency services should be considered and evaluated in light of the providers' responsiveness to the following:

- Patients should be able to obtain the necessary care they need.

- A mental health center should have established communication patterns for consultation, referral and transport of patients.

- Psycho/social emergency services should meet the established criteria for professional accreditation.

*Guam Memorial Hospital Sponsorship of program has been secured and Mental Health Center will provide the bulk of staff resources from existing positions.

- Services should be available 24-hours a day and coordinated between the hospital, physicians, consultants and emergency rooms.

- There should be an established procedure for consultation, referral and transfer of patients.

- Ability to pay should not determine one's eligibility for services.

. Summary - Psycho/social emergencies are diagnosed and treated by the Community Mental Health Center after a physician has given medical clearance. This process is also followed in the case of residential treatment. The psycho/social emergent situations are so varied that a variety of special skills are required thus the broad range of professional services provided at the Community Mental Health Center.

The trend toward establishing more preventive services in close association with emergencies allows for continuity as well as access to mental health services. Although the emergent number of cases appears small, it is difficult to know if those cases reported are repeater or individual cases. Because of limited data on drug overdose and data on other drug induced problems, it is impossible to plan for more sophisticated types of manpower, such as, MICU paramedics who are trained to give medications which can reduce mortality in specific situations.

(4) Poison Control

. Definition - Poison control typically refers to a center that includes those facilities which provide for the medical profession, on a twenty-four (24) hour basis, information concerning the treatment and prevention of accidents involving ingestion of poisons and potentially poisonous substances. There are two types of centers:

- Poison Information Centers (PIC) which provide information on the ingredients and recommended treatment

- Poison Control Centers (PCC) which provides information as well as the facilities and staff to treat poison victims.

. Current Capacity - A Poison Control center does not currently exist on Guam. Both Guam Memorial Hospital and Naval Regional Medical Center maintain poison

information. GMH's poison information center is located in the pharmacy. NRMC's poison information center is located in their library. In either case if an emergency poison victim is seen in the ER, consultation with Honolulu Poison Control Center is the typical process to avoid delay or misunderstanding in the more sophisticated or unusual poisoning situations.

The number of patients seen in GMH's Emergency Department is:

- 1973 24
- 1974 52
- 1/1-6/30/75 19

The attending physician has responsibility for the care and treatment of the poisoned patient. However, if the physician is unable to identify the poison or its antidote he consults additional sources of information.

Trends

To Be Developed.

Criteria - Poison control services should include the following:

- Lay people and professionals should be able to get information on poison care immediately when the need arises.
- Hospital emergency rooms and physicians should be aware of the poison control information service on Guam and Hawaii to be able to provide the proper care.
- Poison information should be current to be effective.
- Information and education programs should be readily available to lay and professional groups.
- When language is a problem facilities should have multi-lingual services available.
- Patient care centers (emergency rooms, physician's offices) should meet established professional guidelines for patient care.
- Efforts should be directed toward coordinating the above services between the poison information center, emergency room, and physicians as well as other ancillary services.

. Summary - Currently Guam must utilize poison information available in reference books or contact the Poison Control Center in Hawaii. The potential for expanding the existing services on Guam appear remote considering the volume of poisonings reported. However, additional information is needed before any trends on Guam can be adequately determined.

(5) Blood Bank

. Definition - The blood bank is a specific facility or location which draws, samples, processes and stores whole blood or blood derivatives for use in surgery, emergencies or other life-threatening situations.

. Current Capacity - Whole blood has an expiration time of 21 days. The average number of pints of whole blood available at GMH's blood bank each month is:

| | | |
|---|---|---|
| O+ | = | 18 pts |
| A+ | = | 18 pts |
| B+ | = | 6 pts |
| AB+ | = | 2 or 3 pts |

The supply of blood is dependent upon donations only. If the bank's supply is completely consumed, the patients family is asked to secure a donor or donors. The Kiwanis Club of Gaum, also, will provide donors during times of emergency or a special need.

A verbal agreement between the American Red Cross and GMH exist to secure additional blood from the Hawaii Red Cross Blood Bank in cases of massive need.

The blood bank is manned twenty four hours a day. Personnel available per shift are:

| | |
|---|---|
| 7 a.m. - 3 p.m. | 4 medical lab technologists<br>4 medical lab technicians<br>1 lab aide |
| 3 p.m. - 11 p.m. | 4 medical lab technicians |
| 11 p.m. - 7 a.m. | 2 medical lab technicians |

No data was available concerning the total volume of blood used during a fiscal year or by peak periods during the year.

. Trends

To Be Developed.

. Criteria - Future blood bank services should include and be evaluated in light of the providers' responsiveness to the following:

- Blood supplies should be kept at the two major hospitals on the island.
- An on-going donor program should be conducted.
- The services should meet the professional standards of DHEW; Food and Drug Administration, AABB, and CCBC.
- Future criteria should relate to total medical care rather than segmented care.
- Blood banks should maintain a continuous supply of blood and its components for use in all phases of medical care.
- Providers should demonstrate their managerial and financial capabilities by a complete and proper audit on a regular basis of all service programs. Formal reports of the audit results should be made to their management, entitled third parties, sponsoring government groups, governing bodies and the public.
- Services should not be based on one's ability to pay. Blood replacement is strongly encouraged.
- The system should demonstrate acceptable methods of collection, distribution and use.
- The Blood Bank should demonstrate proficiency in hepatitis testing.

. Summary - The availability and utilization of the existing blood bank's stock is difficult to determine without data on the amount of total volume used. Information concerning future trends will have to be developed by Comprehensive Health Planning to determine needs, use and sources. More formal agreements should be established to assure the process and methods by which additional blood supplies are available during massive needs.

(6) Constant Care Unit

. Definition - A constant care unit is typically located in an acute care facility and provides intensive as well as cardiac services. The two components of the constant care unit are:

- Intensive care provides treatment of acutely ill patients who have a disease process for which intensive, highly skilled medical and nursing services are known to decrease morbidity and mortality.

- Cardiac care provides advanced definitive care for the most critically ill cardiac patients.

Current Capacity - Guam Memorial Hospital has an eight (8) bed constant care unit. Based on GMH's Annual Report for the period July 1, 1973 thru June 30, 1974 the following occupancy rates are available:

| July | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46% | 35.5 | 62.1 | 42.3 | 53.3 | 40.3 | 54.7 | 42.1 | 24.8 | 29.6 | 47.6 | 45.4 |

There were 151 cardiac patients admitted to the constant care unit. Of this, 102 patients had coronary problems and 15 expired. Another 49 patients had myocardiac insufficiencies, 7 expired.

There are no CCU certified RN's at GMH. The manpower distribution by shift is:

| | |
|---|---|
| 7 a.m. - 3 p.m. | 3-6 RN's, including head nurse |
| 3 p.m. - 11 p.m. | 2-3 RN's |
| 11 p.m. - 7 a.m. | 2-3 RN's |

The Naval Regional Medical Center has a 14 bed Intensive Care Unit (ICU), four of these beds are designated cardiac care. Utilization information concerning the ICU was not available.

Trends

To Be Developed.

Criteria - The development of future constant care services should be considered and evaluated in light of the providers' responsiveness to the following:

- Patients should be able to obtain medical services whenever necessary.

- Patients identified as requiring service should have adequate transportation to the hospital.

- To assure adequate treatment, communication and trenaportation a system should be established which accounts for these activities.

- The services should meet established criteria of professional accreditation.

- There should be an established procedure for consultation, referral and transfer of patients.

- Providers should demonstrate their managerial and financial capabilities by a complete and proper audit of all services.

- Services should be reviewed by internal utilization and quality care assurance groups. External review should be accomplished by a professioanl standards review organization.

. Summary - The Constant Care Unit at GMH appears to be under utilized and minimally staffed. The need for an adequate number of critical care patients is important for maintaining a well trained, efficient staff. This is especially true in cardiac care.

Information concerning trends in utilization levels, patient mix and additional services and equipment need to be developed. Service and transfer agreements need to be developed without adequate information.

(7) Trauma Center

. Definition - A trauma center is a physically distinct part of a general acute care hospital, equipped and staffed at all times to provide prompt, complete and advanced medical care, both immediate and continuing services, to patients of all ages, including newborns, suffering from severe, life threatening or permanently disabling physical trauma. It is usually located within a hospital which has a Comprehensive Emergency Medical Service.

It receives patients by referral from the hospital's emergency service or transport service, or by transfer agreement, from other hospitals within the region. As a highly specialized critical care service, it receives most of its patients by referral, and should have the capacity to accommodate the patients referred from the entire region. The yearly case volume should be adequate to permit maintenance of the skills of the specially trained professional personnel and to make efficient use of that staff.

. Current Capacity - At the present time neither GMH or NRMC have a 24-hour trauma center. The current

utilization levels of both hospitals does not meet the minimum requirements to maintain a full time staff.

. Trends - The trend is toward organization of trauma treatment within a regionalized network based on the degree of severity. Further, this trend includes ambulance services for the rapid transport of critically injured patients to more definitive treatment centers. This means that emergency manpower must be capable of stabilizing the victim prior to transport, thus there is a need for more extensive training and experience for those involved in this expanded role.

This regionalized net will require planning for the specific location of each type of trauma facility and the extent of services required.

. Criteria -

- Staffing - A full time physician, fully qualified and experienced through residency training in the diagnosis and treatment of the severely traumatized patient, should direct the center, which is staffed on a twenty-four hour basis with physicians, registered nurses, licensed vocational nurses, and other nursing personnel specially trained in trauma care, including emergency, life saving procedures. The center should have on call at all times the full range of intensive and critical care specialists who staff those units within the hospital. Staff should be in sufficient number to provide adequate patient care within the unit and consultation to other health care facilities within the region.

  A full time registered nurse trained and experienced in the care of the severely traumatized patient and in emergency life saving procedures should direct the nursing care of the center, with trained nursing staff, registered nurses, licensed vocational nurses, and other nursing personnel. A registered nurse with special training shall be present and in charge of the unit at all times.

  In addition to its own staff, physicians, registered nurses and other allied health personnel shall be promptly available at all times to respond to the trauma center.

  Fully qualified specialists in all specialty categories should be on call for consultation, and physically available to the trauma center within a short time.

- Equipment - The trauma center should have the same service capability, the same equipment, and shall meet the same standards for physical plant as a Comprehensive Emergency Medical Service. The Same support services of the same quality should be immediately available to it on a twenty-four hour basis. For referral the same range of intensive and critical care units should be immediately available to it as to the Comprehensive Emergency Medical Service. The trauma center should be tied into the hospital's communication equipment for coordination of emergency medical services for that locale and designated area.

. Summary - Trauma centers provide advanced medical services. The manpower and equipment required must be sustained by a volume of patients which may not be economically feasible for GMH at this time. Further study and more specific information on potential utilization is necessary before any further activity should be taken. This should include the transport system, the available manpower capable of being trained at the Paramedic level and communication system.

(8) Hospital Emergency Room

. Definition - Emergency medical care is provided in a physically distinct part of a general acute care hospital. The emergency room is staffed and equipped to provide prompt definitive medical care to all patients with urgent medical conditions.

A true emergency is any condition clinically determined to require immediate medical care. Such conditions range from those requiring extensive immediate care and admission to the hospital to those that are diagnostic problems and may or may not require admission after work-up and observation.

. Current Capacity - There are four (4) general practitioners who are assigned to the E.R. at GMH. Specialists are on call. GMH has one emergency room, it is also used as an outpatient department. The E.R. is used for suturing. One surgical treatment room is used for minor cuts as well as follow-up for outpatient department surgical cases and revisits of sutured patients. There are seven examining rooms and seven treatment rooms.

Utilization of E.R. services by year for the period October 1970 through August 1973 follows:

| | Oct-Dec 1970 | 1971 | 1972 | Jan-Aug 1973 |
|---|---|---|---|---|
| Emergency Room Visits | 815 | 4264 | 4625 | 2228 |
| Ratio/Population | 1/26* | 1/22.5 | 1/21.5 | 1.32.9* |

*Ratio based on projection of yearly totals from data given.

GMH, Emergency Room is responsible for the treatment of all urgent medical conditions brought to the hospital. Specialty care and long term treatment are referred to specific units within the hospital or as in the case of psycho/social emergencies to other service agencies on the Island.

Ambulance service is provided by the Department of Public Safety and on unique occasions by the military. Direct communication between the hospital emergency room and the ambulance attendants is not possible except by telephone.

Trends - The trend is toward a categorization of services based on the degree of severity of the injury and the staff's capability to diagnose and treat the patient. Further the population base has been made a major function in the determination of location and extent of services provided for the treatment of emergency victims and how to use it as well as fundamental knowledge of poisons and their dangers.

Criteria

- Organization - The emergency department shall be under the medical direction of a full-time emergency physician who should be the chairman or member of the hospital medical emergency care committee. The department should have organizational status equivalent to that of other clinical departments in the hospital. Staff physicians should be approved by an appropriate medical staff committee.

- Staffing

  .. Physicians - The emergency department should be supervised at all times by a full-time physician, experienced in emergency medicine and who has completed an appropriate residency.

  Physicians staffing should include licensed physicians assigned to and located in the

emergency department twenty-four hours a day. Such physicians should be experienced in emergency medical care.

In addition to an anesthesiologist, specialist physicians in medicine and surgery, should be available on call twenty-four hours a day.

Board certified or Board eligible physicians in all recognized specialties, who are members of the active medical staff should be promptly available to the emergency department twenty-four hours a day.

.. Nursing Staff - Registered nurses identified as emergency nursing specialists should be regularly assigned to the emergency department twenty-four hours a day and in sufficient numbers to screen, evaluate, and administer emergency care and procedures to support the case load and to supervise other allied health personnel. Emergency nurses should have available standardized emergency procedures approved by an appropriate committee of the medical staff. Each should have training and experience in emergency life saving and life support procedures.

.. Equipment - The equipment should include but need not be limited to airway control and ventilation equipment, suction devices, cardiac monitor, defibrillators, pacemaker capability, apparatus to establish central venous monitoring and administrative devices.

.. Blood Bank - The hospital should have a licensed blood bank as defined by the American Hospital Association, containing conventional types of blood and have ready access to a supplemental supply. In addition, blood storage facilities should be in or adjacent to the emergency department.

.. Laboratory Services - The clinical laboratory should be capable of performing rapid analyses of blood gases, pH, serum electrolytes, and other procedures appropriate for emergency medical care including analysis of body fluids for drugs and alcohol. This service should be staffed at all hours by qualified personnel with the hospital and promptly available.

.. Radiological Services - Radiological service should be in or adjacent to the emergency department and should be capable of providing routine studies with fixed or mobile equipment as needed. This service should be staffed at all hours by experienced physicians and qualified technicians within the hospital and promptly available. Contrast studies including angiography should be available on short notice in a radiological facility of the hospital.

.. Operating Room(s) - Operating rooms should be ready and promptly available to patients from the emergency department at all hours for emergency medical procedures, and staffed by in house operating room personnel. For all surgical cases, a Board eligible, or Board certified, physician should be in attendance.

.. Postoperative Recovery Units - A postoperative recovery unit should be in or adjacent to the operating room suite and staffed by trained personnel. All essential personnel should be in-house and promptly available at all hours for post-operative emergency patients.

.. Intensive Care Units - Intensive care units and cardiac care units with provisions for routine monitoring of the electrocardiograms and other physiological parameters is essential. The unit should be staffed at all hours by specially trained personnel experienced in the management of critical care cardiac and respiratory crisis, multiple injuries, renal failures, extensive body burns, and other medical and surgical emergencies. Patients admitted to these units should be seen by an appropriate board eligible or board certified specialist, usually within six hours of admission.

.. Communications - Communications equipment should be required for in-hospital coordination and for direct two-way communications between the emergency department and ambulances, dispatchers, law enforcement personnel, and other hospitals.

.. Helicopter Landing Facilities - Helicopter landing facilities are desirable and should be within close proximity of the entrance to the emergency department.

.. Public Information Service

(1) The hospital should post a sign on an exterior wall clearly visible from public thoroughfares to indicate the availability of a:

Major Emergency Medical Service - Physician on Duty

(2) The hospital should provide an information sheet and/or post signs for the public which clearly explains:

The triage process--the provision of prompt, brief medical evaluation of all incoming patients to determine the nature of the medical problem, the urgency of the condition, and kind of service needed.

The concept of charges for emergency medical care, including laboratory, x-rays, physicians fee, and hospital charges.

(3) It is recommended that the above public information also be provided in the language of any significant non-English speaking population that may reside in the immediate area served by the hospital.

. Summary - The GMH's emergency room is the focal point of the EMS system on Guam. The fact that it is physically a part of the outpatient department should be studied to determine the impact this has had on patient care and utilization of professional manpower. With the trend toward categorization of services based on the degree of severity, the emergency room could become a triage and treatment center. However, until a communication network is established between the GMH emergency room and fire division and military ambulances adequate medical care in the field and preparation at the hospital will be limited.

(9) Mobil Intensive Care Unit (MICU) Paramedic

. Definition - The MICU Paramedic functions as the patient's first link with the acute care system in an emergency situation. Therefore, MICU Paramedics are expected to be proficient in a specific range of emergency procedures. This means knowledge of rescue techniques including extrication and movement of the critically ill; first aid and resuscitation, including:

control of bleeding, maintenance of airway, splinting and care of soft tissue injuries; cardiopulmonary resuscitation in accordance with the American Heart Association standards; biomedical telepulmonary ventilation using the esophageal airway; how to obtain blood for laboratory analysis of medical purposes only; application of rotating tourniquets; complications and contraindications of specific drugs and childbirth assistance and newborn care.

. Current Capacity - There are no MICU Paramedics currently functioning on the Island.

. Trends - Until a basic life support system has a sufficient number of EMT-A's, an MICU Paramedic program is not practical. Because of Guam's geographic location and distribution of primary care physicians, the potential for utilization of mobile intensive care paramedics seems obvious. Within four to five years it is possible that a number of ambulance attendants and emergency room RN's will have reached a level of training sufficient to qualify as MICU paramedics.

. Criteria - The development of future MICU Paramedic services should be considered and evaluated in light of the providers' responsiveness to the following:

- Legislative act should be established to authorize paramedics to provide intensive care services.

- MICU Paramedics should have a response time of less than 10 minutes.

- MICU Paramedics' facilities and equipment should be clearly identified by signs and markers.

- Notification and communication of services should be expeditious and of high quality to insure access to the EMS System.

- Services should be available 24 hours a day, seven days a week.

- Communication and telemetry should be provided between the hospital and the mobile unit.

- Medical standards should meet the professional quality expected for the specific services rendered.

. Summary - Although some thought has been given to the establishment of an MICU Paramedic Program, it is not practical to consider such a move until: a communication network is in place between the GMH and the

ambulances on the Island, the existing manpower available for such a program can attain an EMT-A or equivalent and the medical staff at GMH can provide sufficient training and supervision of MICU Paramedics.

## 2. BASIC LIFE SUPPORT (B.L.S.)

Basic Life Support consists of a limited range of emergency medical services which require a minimal level of technical knowledge. Generally, manpower required for this skill level is at the scene of an accident.

### (1) Emergency Medical Technician-Ambulance (EMT-A)

. Definition - EMT-A's are persons trained in emergency medical care in accordance with standards prescribed by the Department of Transportation (DHEW Publ. No. 1071-C4, April 1970), or an equivalent training program. This allied health person provides emergency medical services according to his level of training and experience. The EMT may perform from the basic care level through the advanced care level.

. Current Capacity - A training program under the US Naval Regional Medical Center conducts the 81-hour EMT Course for its staff. It also offers this course to non-military emergency and health-related personnel. Three EMT-A courses have been given by the medical staff at the NRMC. The first course was completed January 11, 1975 and graduated twenty-five (25) students. The class breakdown of the twenty-five students was eleven (11) naval personnel and fourteen (14) Department of Public Safety Ambulance personnel. Nine individuals certified EMT-A's were Naval personnel; one individual from the Department of Public Safety was certified. The second class graduated twenty-one students; sixteen were military personnel. There were no Department of Public Safety personnel in this class. The third class will complete training June 10, 1976.

The EMT's are responsible for emergency medical care from the time they arrive at the scene through transportation and delivery to the care of a physician. They must operate the emergency vehicle safely and efficiently; ideally they are to maintain communication between the scene of the emergency and emergency departments; render necessary care en route; and transmit records and reports to medical and other authorities.

. Trends - A fourth EMT-A class is being planned by UOG staff and the EMS Coordinator. The Department of Public Safety has requested ten openings for their personnel. To avoid results similar to the first class, there are plans to extend the eighty-one hour course to ninety-six hours thus providing an additional fifteen hours. The expanded training period will be used to give the students additional exposure to the fundamental health sciences which is preparatory to the EMT-A training. If this proves successful, i.e. more public safety staff are certified, the additional hours will be incorporated into the standard course on Guam. Exhibit XIV, following this page, is the proposed course outline.

. Criteria - The development of future EMT-A level services should be considered and evaluated in light of the providers' responsiveness to the following:

- At a minimum the training of EMT-A's must meet the Department of Transportation and DHEW standards.

- One ambulance attendant per shift should be EMT-A certified.

- EMT-A's should have an understanding of the basic health sciences.

- EMT-A's should have a response time of less than 30 minutes.

- Communication capability should be provided between the EMT-A and the hospital.

- EMT-A services should be available 24-hours a day, seven days a week.

. Summary - The EMT-A training program will have to be expanded to allow for up-grading the basic health science knowledge of the fire departments ambulance attendants. Once an EMT-A level has been established within the fire division's ambulance section, a continuing education program should begin. This should be in cooperation with the hospital staff and other health programs on the Island. Further a communication network should be established with GMH emergency department staff to facilitate transfer of information concerning the emergent patient's condition, arrival time, and treatment given before entry into the E.R.

(2) Advanced First Aid/CPR

. Definition - Advanced first aid is the process that consists of recognizing respiratory, cardiac, trauma, and other life threatening situations which require

intravention and transportation to more sophisticated medical care. CPR is the process for starting the proper application of cardiopulmonary resuscitation to maintain life until a victim recovers sufficiently to be transported or until advanced life support is available.

. Current Capacity - Specific information concerning the number of private citizens, public safety and military personnel who have received training in advanced first aid/CPR is very limited. The fire department does not make it a requirement of their ambulance attendants and the American Red Cross of Guam does not maintain records concerning individuals completing training or certification. Advanced first aid training is offered by the American Red Cross as well as a six (6) hour CPR course. A twenty-two (22) hour CPR course is offered by the American Heart Association.

. Trends - Nationally the thrust is toward expanding the number of individuals certified in advanced first aid/CPR. The initial effort on Guam is directed toward upgrading the knowledge base of those individuals in public safety. The American Heart Association on Guam is developing public education programs on use of the EMS system and CPR. With publicity and acceptance by the local medical profession, the public education program should begin to reach more people and provide them with knowledge about the system and how to use CPR.

. Criteria - Appropriate length of training and content must be adopted on Guam for both first aid and CPR training programs.

. Summary - Advanced First Aid/CPR is an area which should receive initial attention in establishing a knowledge base for the ambulance attendants. National standards are available and several training programs have been established on Guam; however, what is acceptable has not been determined. Standard course content and length of training in CPR, Advanced First, etc. must be established for use on Guam.

(3) First Aid

. Definition - First aid is the general knowledge needed to provide initial procedures in recognizing warning signs of closed airways, heart attack or bleeding, and have the fundamental skills necessary to attempt stabilization and prevent complications. The American Red Cross provides the standard twenty-hour first aid course.

# COURSE OUTLINE

COURSE NUMBER: CA193

COURSE TITLE: BASIC TRAINING WORK SHOP FOR EMERGENCY MEDICAL TECHNICIAN - AMBULANCE

CREDIT HOURS: 4

I. CATALOG DESCRIPTION: To teach students the overall role and responsibilities of the emergency medical technician in performing both the emergency care and operational aspects of his job.

To develop student skill in diagnosis and all emergency treatment procedures short of those rendered by physicians or by paramedical personnel under the direct supervision of a physician.

To develop student skill in the use of and care for all equipment required to accomplish his job.

II. TEXT BOOK: Emergency Care and Transportation of the Sick and Injured
Committee on Injuries of the American Academy of Orthopaedic Surgeons
430 Michigan Avenue
Chicago, Illinois 60611

III. COURSE CONTENT: Course consists of 96 classroom hours and 10 hours of in-hospital observation.

a. The EMT -- his role, responsibilities, and equipment
b. Airway obstruction and pulmonary arrest
c. Mechanical aids to breathing
d. Cardiac arrest
e. Bleeding
f. Shock
g. Wounds
h. Fractures of the upper extremity
i. Fractures of the lower extremity
j. Injuries to the a. head, b. face, c. neck, d. spine, e. eye, f. chest, g. abdomen, h. pelvis, i. genitalia
k. Medical emergencies
l. Childbirth
m. Child patients
n. Lifting and moving patients
o. Environmental emergencies

p. Extrication from automobiles
q. Operations
r. Responding to an ambulance call
s. Situational review

IV. EVALUATION: Periodic Written and skill tests

V. RATIONALE FOR OFFERING THE COURSE:

Requested by local Emergency Facilities Committee and should be funded by EMS grant from Department of Transportation and/or Grants for Training in EMS - Public Health Service Act, Sect. 776.

Current Capacity - There is no information available on the number of private citizens who have completed a first aid course on Guam. The American Red Cross on Guam does not maintain records concerning the number of individuals who have been certified as first aiders.

There are ninety-nine (99) firemen in the Department of Public Safety; only forty-six (46) have received first aid training. All ambulance attendants have received first aid training.

Trends - With the increased interest in training the ambulance attendants at the EMT-A level and the American Heart Association's involvement in public education, the demand for more first aid courses for the public seems highly probable. Especially since a national priority by both the American Red Cross and the American Heart Association is to train as many citizens as possible in first aid.

The public school system has also begun to teach first aid measures to high school students.

Criteria - The development of future first aid services should be considered and evaluated in light of the providers' responsiveness to the following:

- Certification records should be maintained and reviewed annually to identify individuals who require recertification.

- Training should meet the minimum criteria of the American Red Cross.

- The community should be made aware of the availability of first aid training courses and their significance.

- Refresher courses in first aid should be a standard component to the annual training program.

- First Aid training should be planned on an annual basis, with participation in scheduling training dates and sites a community wide activity.

Summary - The need for the general public to have basic first aid training has been endorsed by the American Red Cross and the American Heart Association. The local community has shown this to be a major priority in that the local Red Cross and high schools are giving more first aid courses.

The total number of individuals on Guam who are certified first aiders is not available. More important the number of individuals who have either been certified or re-certified first aiders within the past year is not available.

# V. ANALYSIS AND RECOMMENDATIONS

# V. ANALYSIS AND RECOMMENDATIONS

Chapter V is a presentation of our analysis of the Emergency Medical Service system components and the recommendations based upon that analysis. To assist the reader, this chapter has been structured to review the advanced life support and basic life support services from the perspective of each of the seventeen components of the EMS system as defined in Chapter III. Exhibit XV, following this page, is a matrix describing the seventeen components and the emergency medical services described. Thus manpower, for example, includes a description of the hospital emergency room (an EMS service) and has a check in the square across from manpower and down from hospital emergency room.

The intent is to graphically display what services are considered in the analysis of the seventeen components of Guam's EMS system. Each section of this chapter has been designed to identify and analyze services as well as to define the component and review its current capacity. When a recommendation is made to either develop or establish a specific service or program, a final section has been included which reviews implementation considerations.

## 1. MANPOWER

### (1) Definition

Emergency medical manpower includes: physicians, emergency and critical care nurses, ambulance attendants, mobile intensive care paramedics, central dispatchers and telephone screeners, first aid responders, public safety and military personnel. These key individuals provide services which directly affect the patient's health status in an emergency situation.

(2) Current Capacity

Specialized medical personnel is available at both the Guam Memorial Hospital and the Navy Regional Medical Center. Nursing services as well as other supportive services are also available at both facilities. Exhibit XVI, following this page, is a compilation of the number of individuals serving as emergency service personnel. This exhibit is intended as a summary of the emergency medical service manpower on Guam. Gaps in the service sections indicates that either the service is not currently being provided (as is the case in newborn intensive care, and MICU Paramedics) or manpower is not utilized for that service (as is the case in Poison Control). The total number of police division personnel certified as first aiders is not known; however, they are considered first responders.

(3) Analysis and Conclusion

The manpower at the Advanced Life Support (A.L.S.) level is focused into five specific services. It is difficult at this time to assess the adequacy of the utilization of the manpower for this level of service because a consistent system of data collection does not exist to trace trends. For the purposes of this initial draft of the EMS plan, total effort is given to studying the Basic Life Support component. At the Basic Life Support (B.L.S.) level, manpower to meet the initial emergency medical care needs of Guam are inadequate. Because the ambulance attendants have not received training in Advanced First Aid, CPR or other advanced training in treating cardiac or trauma victims. Further, the existing manpower does not receive training in the life sciences or have a requirement that they be knowledgeable (high school level) of basic life sciences. Currently, the ambulance attendants are not receiving continuing education either through classroom presentation or through on-the-job training by physicians or emergency department nurses. Before attempting

EXHIBIT XV

# SCHEDULE OF WHERE EMS ELEMENTS IMPACT UPON SERVICE COMPONENTS

| COMPONENTS | EMERGENCY MEDICAL SERVICES: ADVANCED: BURN CARE | NEW BORN INTENSIVE CARE | MAJOR PSYCHO/SOCIAL EMERGENCY | POISON CONTROL | BLOOD BANK | CONSTANT CARE UNIT | TRAUMA CENTER | HOSPITAL EMERGENCY ROOM | MICU PARAMEDIC | EMT-A | BASIC: ADVANCED FIRST AID/CPR | FIRST AID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Manpower | X | | X | | X | X | | X | | X | X | X |
| 2. Training | | | X | | X | X | | X | | X | X | X |
| 3. Communication | | | | | | | | X | X | X | | |
| 4. Transportation | | | | | | | | | X | X | | |
| 5. Facilities | X | | X | | X | X | | X | | | | |
| 6. Critical Care Units | X | | | | X | X | | X | | | | |
| 7. Public Safety Agencies | | | | | | | | | | X | X | X |
| 8. Consumer Participation | | | | | | | | | | X | X | X |
| 9. Accessibility to Care | X | X | X | X | X | X | | X | X | X | X | X |
| 10. Transfer of Patients | X | X | X | X | | X | | X | | | | |
| 11. Standard Medical Recordkeeping | X | X | X | | | X | | X | | X | X | |
| 12. Public Information and Education | | | | | | | | X | | | X | X |
| 13. Evaluation | X | X | X | X | X | X | | X | X | X | X | X |
| 14. Disaster Linkage | X | X | X | X | X | X | | X | X | X | X | X |
| 15. Mutual Aid Agreements | X | X | X | X | X | X | | X | | | | |
| 16. EMS System Management | | | | | | | | | | | | |
| 17. Legislation | | | | | | | | | | | | |

EXHIBIT XVI

# COMPILATION OF THE NUMBER OF INDIVIDUALS SERVING AS EMERGENCY PERSONNEL BY SERVICE

| EMERGENCY SERVICE PERSONNEL | EMERGENCY SERVICES | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | BURN CARE | NEW BORN INTENSIVE CARE | MAJOR PSYCHO/SOCIAL EMERGENCY | POISON CONTROL | BLOOD BANK | CONSTANT CARE UNIT | HOSPITAL EMERGENCY ROOM | MICU PARAMEDIC | EMT-A | ADVANCED FIRST AID/CPR | FIRST AID |
| Physicians | 1 | | 1 | | | | 4 | | | | |
| Registered Nurses | | | | | | 7-12 | | | | | |
| Lab Technologist | | | | | 14 | | | | | | |
| Clinical Psychologist | | | 1.5 | | | | | | | | |
| Social Service Consultant | | | 1 | | | | | | | | |
| Social Service Worker | | | 6 | | | | | | | | |
| Psychiatric Technologist | | | 1 | | | | | | | | |
| Military Ambulance Attendants | | | | | | | | | 9 | | |
| Fire Department Ambulance Attendants | | | | | | | | | 1 | N/A | 46 |

N/A = Not Available

to expand services at the A.L.S. level, manpower to meet basic life support needs must be expanded. From information available after the completion of the EMT-A training course (see Chapter V.2), several observations can be made:

- Fire department personnel lacked adequate preparation in the basic sciences

- The ambulance attendant who was successful in completing the course and was certified as an EMT-A, transferred back into an engine company after a promotion; however, he will respond in the case of a medical emergency if on duty.

The citizens of Guam currently receive emergency medical care at the scene by ambulance attendants who have had twnety hours of first aid training. From the data we were able to study, it would appear that none of the ambulance attendants have received advanced first aid or CPR training. The results of previous training of ambulance attendants indicates that prior to entering advanced training at the EMT-A level the attendants should receive some basic training in the life sciences and the fundamentals of first aid. The present employee and promotion practices within the Fire Division do not allow for upward mobility of ambulance attendants. A review of the existing personnel policies concerning the Fire Division's ambulance attendants is necessary.

(4) Recommended Goals and Objectives

- Goal - To improve the availability of manpower at the EMT-A and Advanced First Aid/CPR level serving as ambulance attendants.

  - Objective - To develop a preparation course in the basic sciences for those enrolled to take the EMT-A course by August 1976. Preparation course development is the responsibility of UOG and the EMS Coordinator.

  - Objective - To develop a procedure and policy for the selection of ambulance attendants by August 1976. This will be the responsibility of the Fire Division and the EMS Coordinator.

## 2. TRAINING

### (1) Definition

This factor relates to training and continuing education programs including all personnel within the EMS system. Programs will be identified as to whether they are continuing education, residency education, training for critical care nurses, training for all levels of EMT's, training for first aid responders or other associated personnel. Aspects to be considered are necessary resources, adequacy of evaluation and the reassessment process, cost and, if possible, frequency and location of courses offered.

### (2) Current Capacity

Training programs vary on Guam from in-service training for nurses assigned to the constant care unit to classroom courses for EMT-A's and first aid.

The Naval staff at NRMC administer the EMT-A training courses. The course is offered to both military and civilian personnel. The EMS Coordinator is responsible for assuring adequate training services on Guam.

The Red Cross, Guam Heart Association, and other organizations also provide training sessions such as first aid training, CPR training and refresher courses in first aid, CPR and other medical procedures upon request.

At present, there is no ongoing training program for physicians, nurses, and ambulance attendants in currently acceptable medical techniques for emergency medical care.

Continuing emergency medical care instruction is sporadic at the Advanced Life Support level and non-existant at the Basic Life Support level.

(3) Analysis and Conclusions

At NRMC the specialists and experience of the physicians that stand duty in the emergency room varies with each watch. Hospital corpsmen that are assigned to the emergency department have graduated from basic hospital corps school. The level of this school is roughly equivalent to EMT-A. Others have completed certain special advanced courses. The experience as corpsmen vary from two to seven years. Some have had field experience in Vietnam.

There is an ongoing in-service training program for emergency room personnel. This training program is conducted by medical officers and senior staff.

There is no structured training program at GMH for either emergency department staff or ambulance attendants. According to the Medical Director and Chief of Clinics, training is needed to upgrade the knowledge and skills of the hospital staff and ambulance attendants on all levels. Diagnostic skills and emergency medical management skills, as well as professional knowledge need to be improved. For ambulance attendants the need is to introduce them to the fundamentals of emergency triage and care. Further to provide the attendants with more continuing education either in the hospital or at the fire station.

An in-service training program that meets the needs of the ambulance attendants and the hospital staff requires a qualified training director to devote full time to this essential function. Since this does not appear feasible given GMH's budget an alternative would be to assign a senior emergency department nurse as EMS training office. Her duties would be to draft education programs and conduct or coordinate training sessions.

(4) Recommended Goals and Objectives

. Goal - To provide appropriate training and continuing education for hospital emergency personnel, ambulance attendants, police officers, firefighters, lifeguards, and other public safety personnel.

- Objective - To establish an EMT-A training and continuing education program for ambulance attendants that will meet the minimum manpower needs of Guam by January 1978. This should be the responsibility of UOG and the EMS Advisory Board.

- Objective - To establish a continuing education program for GMH nursing staff in constant care, emergency room and other specialty departments by July 1977. This should be the responsibility of GMH medical staff and the EMS Coordinator.

- Objective - To establish a training and continuing education program through the University of Guam for all public safety employees in first aid and CPR by July 1977. This should be the responsibility of the Director of Public Safety and the EMS Coordinator.

3. COMMUNICATION

(1) Definition

The communication system includes access, dispatch, medical consultation linkages between ambulances, emergency medical technicians, hospitals and other public safety personnel. The communication system must be able to support the medical requirements of the EMS system as well as link the appropriate services for a disaster situation. The engineering of the total communication system, and the manpower required to meet the service needs of the system will also be considered.

(2) Current Capability

A call for ambulance assistance normally is received from the following three sources. First, and the most

frequently utilized source, is the direct telephone call to the Tamuning and Agat base stations. The second most utilized source of calls come through the Central Control console at police headquarters in Agana by telephone. The police headquarters dispatcher will relay the message to the central fire dispatcher at the Tamuning station by short-wave. The third source is from the Guam Telephone Authority information operators who, as a matter of policy, call the Fire Station nearest the caller.

Late in 1973 a new 40-watt, 3-channel, Motorola transceiver with scan capability was installed at each fire station. These base stations are keyed to the 375-watt repeater on Mt. Lebugon, located just below Mt. Alutom.

All ambulances have a three-channel, 110-watt, Motorola transceiver with scan function. The ambulances normally communicate with their respective base stations and each other. The ambulance attendants are not able to communicate with the hospital from their vehicles.

A manual-ring, military field telephone connects the Tamuning station with the Naval Regional Medical Center. This telephone is checked out for proper operation on a daily basis but is not typically used for emergency communication purposes.

The Department of Public Safety has a 98 foot tower at Mt. Lebugon that contains repeaters and antennas for the three DPS channels.

The following is the Department of Public Safety's Radio Frequencies:

| Base Stations | | Freq (in MHz) | Mobiles & Portables | |
|---|---|---|---|---|
| Channel 1 | Send | 154.71 | Receive | Channel 1 |
| | Receive | 158.73 | Sent | |
| Channel 2 | Send | 154.77 | Receive | Channel 2 |
| | Receive | 158.79 | Send | |
| Channel 3 | Send | 154.83 | Receive | Channel 3 |
| | Receive | 158.85 | Send | |

(3) Analysis and Conclusions

Guam's EMS system currently does not include a 911 access. Moreover, the system does not have a central dispatch organization, a network for communication between the GMH and the military ambulance, or a means of communication between ambulances. Medical consultation by radio is not available. This is the case because there is no communication linkage with physicians at GMH.

GMH has an old radio on another frequency and uses this radio for their own two vehicles that are radio-equipped. There is a direct telephone line, however, between the Tamuning fire dispatcher and the hospital switchboard operator. However, since the Fire Division's dispatcher has no medical training his in-put or ability to transmit information to the physicians at GMH is limited.

The radio at the NRMC is not on the DPS frequencies and any communications between the two occurs at the NRMC emergency room.

Estimated communications reliability of the PDS's communication system is between 70 and 85%. This reliability is quite low and appears to be caused more from operating techniques than from equipment inadequacies. However, this was not verified through field test.

Some ambulances are not properly grounded for radio noise suppression and motor noise sometimes causes interferance.

Channel 1 is the police patrol channel and its associated antenna is located at the highest point on the radio tower. This channel adequately covers the entire island except Merizo. (Merizo is in the radio shadow of Mt. Lam Lam).

The administration, Fire Division and Police detectives use Channel 2. Channel 2 is located below the antenna for Channel 1. Island coverage for Channel 2 is not as reliable as Channel 1.

The ambulance service shares Channel 3 with fire operations and civil defense functions as well as other calls. This channel has the least effective radio coverage because its associated antenna is located below the other two.

There are several areas where communication are poor or impossible. Any ambulance operating in the military antenna field along Route 16, north of Barrigada is completely blanked out when the military is transmitting.

The southern coast of the island is virtually in radio isolation from the northern part of the island. Even mobile units report having problems talking to each other in the area.

Communications between the hospital and its various ambulances are practically non-existent. The hospital transmitter is very old and has been out of order for several years. To transmit from the hospital a pager is used, however, with its very low power, it does not transmit much beyond the base gate.

The Department of Public Safety plans to begin installation of a new communications system in 1976. There will be a 330-watt, General Electric, narrow band repeater located on Nimitz Hill. This repeater will transmit on 150.775 Mhz and 155.775 Mhz. There will be three General Electric, local control transceivers as hospital base stations. The mobile units will also be General Electric transceivers and will operate on 35 watts of power.

As has been pointed out in previous reports: "We are all painfully aware of the reliability of the telephone service on Guam. There is little to gain by expounding on its weaknesses. It must be pointed out, however, the lack of a working telephone near the scene is the delaying factor that is most often encountered in getting emergency medical care to the victim. It is also the most dangerous weakness in the communication system."

The telephone system suffers from age, obsolescence of equipment, greater demand, amd lack of a master plan. Coordination between the Guam Telephone Authority and other agencies has not been as successful as intended.

(4) Recommended Goals and Objectives

. Goal - To improve the existing communication system by assuring interface with the hospital base station, military ambulances, fire, police, civil defense and other public and private agencies.

- Objective - To extend the current range of communication service raise the tower to 200 feet by June 1977. This should be the responsibility of the Department of Public Safety.

- Objective - To install compatible two-way radio communication equipment in military and civilian emergency vehicles with adequate access to both hospital base stations communication equipment by June 1977. Joint responsibility of DPS, GMH and the military.

- Objective - To establish one emergency telephone number for all Islandwide ambulance services by June 1978. This should be the joint responsibility of GMH, GTA, Public Health, Public Safety, the Military Services, and the EMS Coordinator.

## 4. TRANSPORTATION

### (1) Definition

Transportation consists of the different types of ground, air and water transportation available for primary and secondary response situations. Further, the various categories of emergency vehicles are to be coordinated within the total system. Other aspects to be considered are centralized command control, service to recreational and inaccessible areas and the replacement of vehicles.

### (2) Current Capacity

There are seven fire stations operated by the Department of Public Safety, five of these stations maintain an ambulance and attendants. Ambulance service is provided by the Government of Guam to anyone in medical need. The utilization of the ambulances falls into two broad categories: emergent and non-emergent. The great percentage of non-emergent runs which require no first aid are typically for transport services to routine medical appointments.

The average response time in a rural community should be from 15 to 25 minutes. Response time on Guam between GMH and the ambulance routes varies from 5 to 10 minutes in Tamunig to over 60 minutes from Inarajan and Merizo. It is estimated that 36% of the population served by the Department of Public Safety live outside the area of rapid response.

Military ambulances provide service to military personnel and their dependents. In an emergency a military ambulance

will provide transport to civilians. There are nine (9) military ambulances on Guam. Because of their geographic location the response time of their vehicles to GMH is slightly better than the Department of Public Safety. Medical equipment on the public safety vehicles is less than adequate. The military vehicles are better equipped and maintain a broader spectrum of medical supplies.

(3) Analysis and Conclusions

The system operated by both the civilian and military communities provides a total of 15 ambulances* for a combined population of approximately 116,000 people. Charles A. Eisenhardt, Jr., president of the Ambulance Manufacturers Association has estimated that it takes a population of 10,000 persons to generate one ambulance trip/day. At that rate the two systems are generating approximately slightly more than one trip for every other vehicle per day. Because the existing data does not provide information on runs it is difficult to determine valid number of emergent trips. Further, the two systems cannot be combined for analytical purposes thus restricting the opportunity for comparative analysis of service, incidence and response time.

The civilian vehicles need to either be replaced or overhauled. The vehicles lack sufficient equipment and in some cases in need of repair.

No formal agreements currently exist in terms of who has responsibility at the scene when both military and civilian ambulances respond. Further, dispatching does not always identify the proper responder. Thus, the equipment, dispatch and coordination of on-scene responsibility needs to be improved.

* Five DPS stations have six (6) ambulances (2 at Tamuning); There are nine (9) military ambulances.

(4) Recommended Goals and Objectives

. Goal - To improve the coordination of air, land and sea transport services between the military and civilian organizations

- Objective - To establish a central dispatch and communication net for use by public safety and military vehicles before June 1977. This is the responsibility of DPS the military services and the EMS Coordinator.

- Objective - To improve the medical equipment and supplies on Public Safety ambulances to meet Department of Transportation and Health, Education & Welfare standards by June 1978. This is the responsibility of DPS and the EMS Coordinator.

- Objective - To establish a formal agreement between the Department of Public Safety and local military commands concerning the role and responsibility of their ambulances in responding, treating and transporting patients. This agreement should be established by December 1976. This is the responsibility of the EMS Coordinator.

5. FACILITIES

(1) Definition

Health facilities includes hospitals, clinics and mental health centers. A description of each facility including their services, patient volume, number emergency cases and the staff patterns of the emergency department.

(2) Current Capacity

The only civilian hospital, Guam Memorial Hospital (GMH), operated by the Government of Guam is located in Tamuning which is within the center of Guam's major population. GMH and the Naval Regional Medical Center (NRMC) are equipped to provide emergency care. Except for the constant care unit at both hospitals, Guam does not have "specialized critical medical care units."

All military clinics on Guam provide limited emergency care. There are five military clinics, one located at each of the military installations with the exception of the Navy hospital.

Exhibit XVII, following this page, depicts the volume of services provided by both hospital facilities.

(3) Analysis and Recommendations

It was difficult to obtain data relative to the volume and work load of staff in each of the hospitals. In those cases in which data are available and from the population statistics available in Chapter II, it is clear that the number of patients is not adequate to either expand highly sophisticated programs, such as, burn care or develop a sophisticated poison control cneter. The patient volume is not sufficient to justify expenditures for services of this nature.

Because of the limited types of medical services available in both hospitals, the service mix and access to care is critical. At this time there are no formal arrangements between GMH and NRMC. Duplicate services exist and are understandable given the nature of the differences in clientele. However, gaps in either GMH or NRMC's medical services should be identified and where possible mutual aid agreements established with hospitals off Island to meet the emergent patients needs.

Information concerning the volume and staffing of private medical clinics was not available. However, their close proximity to GMH and the solo practitioners lends itself to the maldistribution of medical practice on Guam. The medical clinics are not designed to handle extensive

TABLE OF FACILITIES SERVICES,
PATIENT VOLUME, EMERGENCIES
AND STAFFING PATTERNS

| | GMH | | | NRMC | | |
|---|---|---|---|---|---|---|
| | PATIENT VOLUME | NO. EMERGENT CASES | STAFF | PATIENT VOLUME | NO. EMERGENT CASES | STAFF |
| Burn Care | Not Available | N/A | 1 Surgeon | N/A | N/A | No surgical staff |
| New Born Intensive Care | N/A | 1974 - 84 pts. | N/A | N/A | N/A | 3 pediatricians |
| Major Psycho/Social Emergency | N/A | 1974 - 140 pts. | 1.5 Clinical Psychologist<br>6 Soc. Services Workers<br>1 Psychiatric Tech<br>1 Social Service Consultant | N/A | N/A | N/A |
| Poison Control | N/A | 1974 - 52 pts. | N/A | N/A | N/A | N/A |
| Blood Bank | N/A | N/A | 4 Lab Technologist<br>10 Lab Technicians<br>2 Lab Aides<br>2 Med Lab Technicians | N/A | N/A | N/A |
| Constant Care Unit | 151 cardiac patients | N/A | 7-12 RN's | N/A | N/A | 2 CCU certified RN's |
| Hospital Emergency Room | N/A | 1972 - 4625 pts. | 4 MD's<br>Specialist on call | N/A | Not Available | 24-hour MD on duty |

N/A = Not Applicable

EXHIBIT XVII

emergency situations. Although the medical clinics have been used during times of disaster, a disaster plan which will incorporate clinic facilities into the emergency service plan is required.

Before a detailed analysis of Guam's medical facilities can be conducted to determine use, services, categorization, and physician design, more information is required on the number of patients, volume of emergent cases and staff capacity for specific services. This is a significant effort and will be necessary to establish an advance life support system.

(4) Recommended Goals and Objectives

. Goal - To establish the necessary mechanisms to assure maximum utilization of all public and private facilities on Guam with appropriate measures included to assure the involvement of the military facilities, as well.

- Objective - To develop a categorization plan for services offered at GMH as well as a categorization plan for all facilities providing emergency medical services on Guam by January 1978. This is the responsibility of GMH, the medical society and the EMS Coordinator.

6. CRITICAL CARE UNITS

(1) Definition

The critical care units to be considered will include trauma, burns, plastic surgery and blood. Although not all critical care facilities are available in the EMS planning area, this element does review those for which services are being provided.

(2) Current Capacity

There are four service areas described in this section. They are:

. Burn Care - Which is typically treated in the emergency room of GMH. There are no burn beds at GMH. If the burns are diagnosed as serious and require hospitalization, the patient is admitted according to age and/or service. There is only one plastic surgeon on Guam, the Navy and Air Force, when necessary, transfer their burn patients to GMH for treatment and care.

. Blood Bank - The Guam Memorial Hospital maintains a blood bank which has available whole blood for emergency use. The supply of blood is dependent upon durations only. If the bank's supply is completely consumed, the patients family is asked to secure a donor or donors. The Kiwanis Club of Guam will provide donors during times of emergency or a special need.

  A verbal agreement between the American Red Cross and GMH exist to secure additional blood from the Hawaii Red Cross Blood Bank in cases of massive need.

  The blood bank is manned 24 hours a day.

. Constant Care Unit - GMH has an eight (8) bed constant care unit. Based on GMH's Annual Report for the period July 1, 1973 through June 30, 1974 the average monthly occupancy rate was 43.6%.

  The Naval Regional Medical Center has a 14 bed Intensive Care Unit of which 4 beds are for cardiac care. Occupancy and staffing data were not available. However NRMC has the only cardiac care certified RN's on Guam.

. Hospital Emergency Department - There are four general practitioners who are assigned to the emergency department at GMH. Specialists are on call. GMH has one emergency department; it is also used as an outpatient department. There are seven examining rooms and seven treatment rooms. Utilization of the emergency department has been at approximately 4,500 patients per year for the past several years.

(3) Analysis and Recommendations

An incomplete data base precludes an analysis of the critical care units. Further the perceived levels of uti-

lization as well as the limited resources available indicates that expansion is very unlikely at this time. Therefore it is recommended that a data collection system be established to provide information concerning patient volume, occupancy rates and patient conditions by type and degree of severity.

(4) Recommended Goals and Objectives

. Goal - To assure critical care service will be available to meet the unique medical needs patients

- Objective - To establish a data system which will determine patient volume, occupancy rate and patient condition by type and degree of severity. This system should be operational by June of 1977, and the responsibility of GMH and the EMS Coordinator.

- Objective - To establish formal mutual aid agreements to assure critical patient care during disasters and periods when the existing system is completely utilized or adequate staff is not available by November 1977. This is a joint responsibility of constant care providers and the EMS Coordinator.

## 7. PUBLIC SAFETY AGENCIES

(1) Definition

Public safety agencies are involved at the Basic Life Support level of the EMS system. They are involved with communication and transportation of emergent patients. A description of how interfacing occurs with these agencies is provided.

(2) Current Capacity

The Department of Public Safety is directly tied to the EMS system through the communication dispatching center and as ambulance attendants in the Fire Division. Beyond this

the Police officers are instructed in how to work with the ambulance attendants and, also, have basic first aid training.

The Police and Fire Divisions are within the Department of Public Safety and coordinate their efforts through the Department. However, interfacing with the medical system is not as well defined. The communication link does not allow for information exchange between the ambulance attendant and the hospital. No formal method exists for ambulance attendants and emergency department personnel to meet and exchange information concerning their patients treatment and outcome. More significantly the attendants are tested by GMH medical staff to assure medical knowledge or skill level in specific emergent situations.

(3) Analysis and Recommendations

The interfacing of Public Safety and Medical services must be improved. The communication and transportation system was reviewed above. The other areas where improvement is recommended are:

. Hold formal meetings between ambulance attendants and hospital staff to secure a better understanding of their roles, duties and responsibilities; and,

. A patient review committee should be established to study unique patient care situations utilizing recent cases in which the hospital and Fire Division staff were involved. The information obtained from these reviews would be utilized by other ambulance attendants as learning instruments.

(4) Recommended Goals and Objectives

. Goal - To establish a more effective interface between the Department of Public Safety and GMH

  - Objective - To establish a formal agreement between GMH, and the Department of Public Safety's Ambulance attendants by July 1976 to meet regularly

to coordinate medical transportation issues. This is the responsibility of GMH, DPS, and the EMS Coordinator.

- Objective - To begin a system for reviewing patients transported by ambulance to GMH with hospital staff, ambulance attendants and other relevant agencies by December 1976. This is the responsibility of the EMS Coordinator, GMH and DPS, Fire Division.

## 8. CONSUMER PARTICIPATION

### (1) Definition

This section will describe how provisions for consumer participation in determining system policy has been utilized in plan development and continued operation of the EMS system.

### (2) Current Capacity

To assist in the design and implementation of this EMS plan an EMS Advisory Board composed of:

. Department of Public Safety (both police and fire);
. Department of Public Health and Social Services;
. Department of Public Works;
. Guam Memorial Hospital;
. Guam Telephone Authority;
. Civil Defense;
. Medical Center of the Marianos;
. Naval Regional Medical Center;
. A representative of the News Media; and,
. Nine health consumers from the Community,

will be established through Executive Order.

The reason for the broad representation of providers and consumers is because of their integral role and responsibility in providing emergency medical services. Consumer participation may be a relative new experience for some of the participants, therefore, Board members may require additional support and guidance during their early meetings.

(3) Analysis and Recommendations

The EMS Advisory Board will make a necessary contribution in the further design and development of this plan. Their involvement will be utilized in review, approval and implementation of the EMS Plan. Because of the Board member's knowledge of EMS and the plans intent, their involvement during implementation will provide continuity to the plan as well as assure knowledgeable input.

Additional consumer input, however, is needed. This can only come from greater opportunities to provide involvement. To meet this need consumers will need to be involved at every decision level. Thus each subcommittee of the EMS Advisory Board should have consumer representation.

(4) Recommended Goals and Objectives

. Goal - To assure adequate consumer representation on all EMS subcommittees

- Objective - To appoint consumers to all subcommittees formed by July 1976 and any subcommittees thereafter. This is the responsibility of the EMS Advisory Board.

- Objective - To assure that an adequate number of consumers are knowledgeable about EMS on Guam, hold consumer information and participation workshops twice a year beginning in November 1977. This is the responsibility of the EMS Advisory Board.

## 9. ACCESSIBILITY TO CARE

### (1) Definition

This means does the EMS system provide for the emergent patient who is unable to pay. A review of how the Government of Guam assures coverage of its citizens is provided.

### (2) Current Capacity

At the present time the Government of Guam underwrites health care delivery for the indigent patient who is unable to pay for ambulance transport to the hospital as well as medical care. The billing structure of GMH is below the existing medicare rates.

Procedures for funding patients seeking private medical care have not been developed by the Government of Guam. Thus the patient must pay for private medical care from his resources or through a third party.

### (3) Analysis and Recommendations

It is difficult to analyze the existing financial system without a detailed review of operational cost and revenues. However, the need to assure that services are available and that the price of medical care is not a factor must be a constant objective. Thus it is recommended that a review of the existing system for financing emergency medical services be made to assure that patients are adequately accessing emergency medical services.

### (4) Recommended Goals and Objectives

. Goal - To assure all patients have access to emergency medical services

- Objective - To establish an ongoing committee composed of consumers and providers to determine if all patients can access the EMS system effectively. The committee should present its findings and recommendations to the EMS Advisory Board by January 1978. The selection of committee members should be the responsibility of the EMS Advisory Board.

## 10. TRANSFER OF PATIENTS

### (1) Definition

This means the flow or referral of the patient through the various phases of the treatment process. This will include transportation and facilities. The location, capacity, type of patients, accessibility and criteria of care are elements of this factor.

(2) Current Capacity - Because Guam consists of only one Public Hospital and a military facility which is typically for extreme emergencies only, the transfer of patients is between these two hospitals and in some cases Queens Hospital in Hawaii. GMH's policy and procedure manual deals with transfer of patients through the treatment process.

### (3) Analysis and Recommendation

As noted earlier, without an adequate communication system or properly trained attendants, the patient transfer process at the initial phase of emergency department admission is in danger of failure. Thus for the next year this phase of the system must be improved before we can address other aspects of the patient transfer process.

### (4) Recommended Goals and Objectives

- Goal - To assure proper transfer of all patients through the treatment process

- Objective - To establish a formal method which assures patients are adequately transferred from ambulance to hospital to specialty clinic or hospital by July 1977. This is a joint responsibility coordinated by the EMS Advisory Board.

## 11. STANDARD MEDICAL RECORD KEEPING

### (1) Definition

This means the specific information required and collected on emergency patients. What information is needed, such as, the time the emergency medical system was accessed, medical care dispatched and the treatment provided are examples of the information medical records can provide. Aside from the monitoring of the records and assuring their accuracy, the planner must maintain the confidentiality of the patient's medical information.

### (2) Current Capacity

The Emergency Department at GMH does not maintain an emergency treatment report on each patient; however, summary data on each emergency patient is tabulated and identifies the patient's primary and secondary diagnosis as well as date of discharge.

The Fire Division maintains ambulance run reports which provide the name of the patient and the time the vehicle was dispatched and returned. However, no information is provided concerning patient status, treatment or disposition. The military ambulance attendants keep no records of patient volume, diagnosis, or dispatch and return time.

### (3) Analysis and Recommendation

The existing medical record system is less than adequate. A more detailed record of ambulance runs is necessary.

Emergency patient information at GMH and Fire Stations should be aggregated. Agreement will have to be reached regarding the specific information required on ambulance runs, patient volume, patient condition, care given and the specific time of arrival at scene, treatment and dispatch occurred.

The system agreed to will have to assure confidentiality of the patients medical information, and finally, a method will have to be designed to assure accuracy of the data collected. This is critical, especially in light of the limited accurate data available in this initial planning effort.

(4) Recommended Goals and Objectives

. Goal - To establish a medical record keeping system which will meet the needs of its users

- Objective - To design a medical record keeping system which will provide information concerning emergency patients at the scene of an accident, in transit, on admission to the emergency department and transfer into the hospital by January 1978. This will be the responsibility of the EMS Coordinator.

12. CONSUMER INFORMATION AND EDUCATION

(1) Definition

This includes information on how consumers can access the emergency medical system. It is anticipated that further information will be provided on available emergency services; their location and how to determine what to do for specific injuries or medical emergencies. The planner will be concerned with the content, relevancy and coordination of the informative programs presented.

(2) Current Capacity

Aside from radio spots describing heart conditions and how to take action in cases of emergency, there is little else being provided concerning health information to consumers. Current health information programs are supplied by the American Heart Association. The Red Cross provides a number of educational courses to the general public.

The NRMC conducts EMT-A courses which are available to the public. The course is also open to employees of the Department of Public Safety.

(3) Analysis and Recommendations

Because of the limited amount of information being developed for the public concerning the EMS system, a major focus for the next couple of years should be toward establishing information on what is the EMS system, how it can be used, and who to contact. This program should be designed to reach visitors, military and the local residents.

(4) Recommended Goals and Objectives

. Goal - To establish a public education and information program for all people of Guam so they know about the EMS system, how to access it, and how to use it.

- Objective - To develop information for visitors and residents which describes the EMS system and how to use it by January 1978. This should be the responsibility of the EMS Coordinator.

- Objective - To assist in the design and development of a public education program which will identify and describe various emergency situations specific to Guam. This program will be a continuous part of the EMS program with the first program presented in June 1978. This is the responsibility of the EMS Coordinator.

## 13. EVALUATION

### (1) Definition

This is to determine whether the specific goals were achieved. This will include an assessment of the management of the implementation of the EMS plan. The evaluation will measure process as well as impact of the patient care system utilized. Baseline data (or data elements) will be determined for each of the measurement criteria which will assess change. From this data sources will be identified and collection instruments will be developed. Analysis of the data will be based on the measurement criteria and the purpose to which the information is to be used. Our evaluation will be designed to assess the systems impact upon the delivery of emergency medical services.

### (2) Current Capacity

To be developed.

### (3) Analysis and Recommendations

The existing data system does not provide information which will measure the effectiveness of the emergency medical services. Further, measurement criteria and evaluation objectives have not been identified thus the first priority of the EMS Advisory Board will be to define the evaluation objectives. The areas which need immediate assessment are the transportation system and GMH's emergency department. Within transportation some of the issues which need to be defined as evaluation objectives include time factors, manpower utilized, patient condition, equipment used and procedures followed. Within the emergency department the issues are the treatment process, manpower utilized, patient volume and transfer.

(4) Recommended Goals and Objectives

. Goal - To establish evaluation objectives which measure the effectiveness of the EMS system.

- Objective - To form an evaluation committee composed of consumers, providers, planners and an outside consultant to design objectives and measurement criteria by September 1976. This will be the responsibility of the EMS Advisory Board.

- Objective - To develop measurement instruments based upon the objectives to assess the ambulance services, and hospital emergency department. This should be completed by December of 1976. This is the responsibility of the EMS Coordinator.

## 14. DISASTER LINKAGE

(1) Definition

This addresses the emergency medical services available during a disaster. This aspect of the plan must consider a systematic method to deliver emergency medical services during a disaster as well as the necessary modifications of the EMS system's routine procedures during a disaster. To be fully effective this means adequate non-telephonic communications are available, disaster information is available and accessible, and that necessary changes can be effected immediately. Finally, the disaster plan must be tested once each planning year.

(2) Current Capacity

The Office of Civil Defense has prepared a disaster plan for Guam. Incorporated into the disaster plan is the responsibilities and duties of the different governmental agencies and departments. The military is included in the plan for back-up services which the public agencies cannot provide.

The emergency medical services component to the Civil Defense disaster plan is not complete. The EMS Plan of Guam provides a definition for each medical service implementation during a disaster. However, additional data will be required concerning coordination of volunteer medical services with the existing medical system.

(3) Analysis and Recommendations

A major difficulty with the existing Disaster Plan is an adequate statement of how the medical services will be coordinated in time of a disaster. To a very large degree each disaster must be dealt with individually. However, basic criteria can be established which designates which agencies have responsibility and how they will carry out their task during a disaster. Further, system wide practice is critical and should include a proper assessment of the efforts and activities of the participants.

(4) Recommended Goals and Objectives

. Goal - To establish an emergency medical service system which has linkage with other agencies in case of disaster

- Objective - To determine roles and responsibilities for each medical service with linkage to the appropriate public agency in case of disaster. To be completed by December 1977. This is a joint effort facilitated by the EMS Coordinator.

15. MUTUAL AID AGREEMENTS

(1) Definition

This means that the areawide EMS plan has been agreed upon; that the capability, availability, and location of the EMS resources have been determined; and that cooperative

agreement has been established between the military and public jurisdictions to assure adequate financing.

(2) Current Capacity

Guam Memorial Hospital refers patients to mainly two hospitals in the United States. GMH, however, is not restricted from referring its patients to other hospitals abroad. Nonetheless, GMH patients are being referred mainly to the University of California, Los Angeles Medical Center and to Queen's Medical Center in Honolulu, Hawaii. There is no written agreement for this arrangement. However, the Department of Public Health and Social Services has a written agreement with Queen's Medical Center in Honolulu, Hawaii to refer patients for emergency as well as non-emergency medical care.

There is written agreement that the Naval Regional Medical Center, Guam, provide medical services to the Trust Territory government, whether emergency or non-emergency, for services that otherwise cannot be provided by the Trust Territory government itself.

(3) Analysis and Recommendations

The lack of formal agreements as well as a complete survey of resources indicates that the need for initial identification and allocation is required before mutual aid agreements are possible. Several areas have advanced to the point where mutual aid agreements can be established within the next several months; however, the vast majority of services and programs will have to be surveyed and problems identified before mutual aid agreements can be established.

(4) Recommended Goals and Objectives

. Goal - To establish mutual aid agreements where necessary for every medical program which impacts upon the emergency medical services system.

- Objective - To survey the existing resources to determine program gaps which can be met by other agencies or programs. This is to be completed by December 1977. This will be the responsibility of the EMS Coordinator.

- Objective - To assist GMH and other medical service providers to establish mutual aid agreements which meet the goals set forth in this EMS Plan. This will be a continuous process. The coordination of this effort is the responsibility of the EMS Advisory Board.

- Objective - To develop a written mutual aid agreement between Guam, the Trust Territories of the Pacific Islands, and the NRMC for a coordinated emergency care delivery service dealing with the exchange of service, communication linkages, licensure, certification, and reimbursement, where necessary. This agreement should be established by June 1977. The EMS Coordinator should facilitate this agreement.

16. EMS SYSTEMS MANAGEMENT

(1) Definition

This relates to the coordination, implementation and operation of the EMS plan. It will identify who has management responsibility of the EMS system and its component.

(2) Current Capacity

To be developed.

(3) Analysis and Recommendations

To be developed.

(4) Recommended Goals and Objectives

To be developed.

17. LEGISLATION

(1) Definition

This section has been included at our discretion because of increased involvement by federal, state and local governments in legislating programs, guidelines, standards and procedures which directly affect the design, implementation and operation of this plan. Included are a number of local laws which impact upon the EMS plan's goals and expectations.

(2) Current Capacity

| | |
|---|---|
| Declaration of policy<br>Declares that it is the territory's policy to promote safety for persons and properties with the use, operation, and equipment of vessels | Title IX, Dept. of Public Safety, Chapter XVI, Territorial Boating Act Section 8995.1 |
| Collisions, accidents and casualties<br>Requires the operator of a vessel involved in an accident, collision, or other casualty to assist those injured in the accident, collision or other casualty, and to provide in writing to the person injured and to the owner of any property damaged, his name, address and identification of his vessel. | Title IX, Dept. of Public Safety, Chapter XVI, Territorial Boating Act, Section 8995.10 |
| Comprehensive safety and educational program<br>Authorizes the Department of Public Safety to commence a comprehensive boating safety and educational program, to establish appropriate advisory groups, and to seek the cooperation of boatmen, the Federal government, etc. | Title IX, Dept. of Public Safety, Chapter XVI, Territorial Boating Act, Section 8995.15 |

| | |
|---|---|
| In-service training for resident nurses<br>Provides in-service training to permanent resident professional or practical nurses for two years to obtain a degree in nursing | Title XII, Dept. of Education, Chapter XI-A, Nurse Training Section 11889 |
| Conduct of operators and pedestrians on approach of authorized emergency vehicles<br>Requires the operators of all vehicles to yield the right of way and to remain as close as possible to the right-hand edge or curb of the highway upon approach of an authorized emergency vehicle sounding a siren or exhibiting a red or blue light. | Title XXIV, Vehicle Code, Chapter II, General Provisions Section 23128 |
| Acknowledgement and declaration of intent<br>States that the Government of Guam acknowledges that the provisions of the Williams-Steiger Occupational Safety Act of 1970 (P.L. 91-596) are applicable to the island and will comply and observe such requirements. | Title XLVI, Dept. of Labor, Chapter II, Occupational Safety and Health Act of Guam Section 48201 |
| Agency responsible for occupational safety and health<br>Designates the Department of Labor as the agency responsible for developing and administering a plan in accordance with the provision of Section 18(c) of the Williams-Steiger Occupational Safety Act of 1970. | Title XLVI, Dept. of Labor, Chapter II, Occupational Safety and Health Act of Guam Section 48202 |
| Authority of agency with respect to occupational safety and health<br>Authorizes the Department of Labor to make and publish occupational and health standards for Guam which meet the indices of equal effectiveness as published by the U.S. Dept. of Labor. | Title XLVI, Dept. of Labor, Chapter II, Occupational Safety and Health Act of Guam Section 48203 |

| | |
|---|---|
| Division of Occupational Safety and Health<br>Establishes within the Department of Labor a Division of Occupational Safety and Health responsible for investigating and inquiring into the causes of injuries or sickness arising out of and in the course of employment and to assist in the preparation of such occupational safety and health as needed to aid in the prevention of such injuries or sickness. | Section 48204 |
| Civil Defense, Purpose<br>Provides for the creation of an Office of Civil Defense for the territory to insure that the territory will be adequately prepared to deal with disasters or emergencies of unprecedented size and destructiveness resulting from enemy attack, sabotage, etc. as well as from the vicissitudes of nature, to protect the peace, health and safety of the public and to preserve their lives and their property | Title IX, Dept. of Public Safety Chapter VI, Civil Defense Sections 8500-8519 |
| Accidents<br>Requires the operator of any vehicle involved in any accident causing injury or death to any person or causing damage to any real or personal property to stop such vehicle immediately at the scene of such accident. | Title XXIV, Vehicle Code, Chapter II, General Provisions, Section 23136 |
| Commission<br>Provides for the creation of a "Commission on Licensure to Practice the Healing Art in Guam" consisting of five members appointed by the Government of Guam.<br><br>The Commission shall appoint boards of examiners in basic services, in medicine and osteopathy, in chiropractic, in dentistry, in midwifery, and such others in drugless healing as are necessary. | Title XXVIII, Medical Practices, Chapter II, General Provision Section 27101 |

| | |
|---|---|
| Nurse Practice Act<br>Requires that any person practicing professional or practical nursing shall be licensed under the provisions of this Act. | Title XXVIII, Chapter III |
| Midwives<br>Requires that any person practicing midwifery should be licensed under this law. | Title XXVIII, Chapter IV |
| Policy Statement<br>No person shall be denied complete medical care and services by reason of his inability to pay therefore. People shall be required to pay in accordance with their means. Abatements and discounts will be allowed from the established schedule under rules and policies established by the GMH Administrator and approved by the Board of Trustees. | Title XLVII, Guam Memorial Hospital, Chapter I, Section 49008 |
| Chief Medical Examiner<br>He shall examine circumstances of death resulting from criminal violence, casualty, suicide, suddenly when in apparent good health, in prison, or in any unusual or suspicious manner. He is authorized when considered necessary to exhume interred bodies and to perform autopsies. | Title XLVII, Chapter II, Section 49102 |
| Mentally Ill<br>Provides for hospitalization on medical certification in an emergency situation and provides for hospitalization without endorsement or medical certification in an emergency situation. | Title XLVII, Chapter III, Section 49206<br><br>Section 49207 |
| Liability for Rendering Emergency Care<br>An Act to amend Section 3284 of the Civil Code of Guam to provide that any person who renders emergency care shall be only liable for damages resulting from his gross negligence or wanton acts or wanton omissions. | P.L. 12-92 |

(3) Analysis and Recommendations

Although existing Government Codes and legislation address a broad segment of the functions and issues currently affecting the EMS system. Many of these codes and legislative acts need to be reviewed and updated especially the Practice Acts. Further the organization and responsibility of managing emergency medical services may require legislative action.

(4) Recommended Goals and Objectives

To be developed.

# VI. IMPLEMENTATION PLAN

# VI. IMPLEMENTATION PLAN

This chapter is the initial implementation plan. The purpose of this chapter is to present an action plan based upon the recommendations and objectives developed in Chapter V. There are two sections to this chapter. They are the work plan and staffing.

## 1. WORK PLAN

Exhibit XVIII following this page, is a schematic of the implementation plan based upon five elements which were identified as having the highest priority. These elements were selected based on the objectives listed in Exhibit XIX, which follows Exhibit XVIII. The objectives with the early due dates (before June 1977) will establish a foundation for the development of a Basic Life Support (B.L.S.) system.

The task described in Exhibit XVIII are for the period April 1976 through March 1977. A work plan to achieve the objectives targeted between March 1977 through June 1977 will be developed by the EMS Coordinator based upon the experience of implementing this work plan. The foundation is necessary if the Government of Guam expects to obtain a 1203 grant for development of a Basic Life Support System. The reason for the system to have an adequate foundation prior to seeking additional federal funds is to (1) demonstrate an interest in establishing and maintaining the system; (2) establish the necessary capacity to demonstrate the ability to develop additional services, equipment and manpower; and (3) provide an opportunity to establish a planning method to combine various sources of revenue and planning activities, such as the EMSS Act of 1973 and the Highway Safety Act of 1966. Thus this initial implementation plan has documented areas of the EMS system which require a fundamental change in either scope or content. These areas are:

(1) Manpower
(2) Training

(3) Communication/Transportation

(4) Evaluation

(5) EMS System Management

Although elements (1) through (4) are discussed in Chapter V, the EMS system management (5) element has not been developed. The Department of Public Health and Social Services is currently involved in reorganizing the Office of Comprehensive Health Planning due to Public Law 93-641. Since the EMS function was in the Office of Comprehensive Health Planning, the changing role and responsibility of the Office will impact upon the management of the EMS system. Thus the results of new staff, added responsibility under Public Law 93-641 and the recent combining of Highway Safety and Public Health EMS planning efforts will provide a definition of the scope and nature of the EMS management system.

The following is a detailed discussion of the task plan for each element.

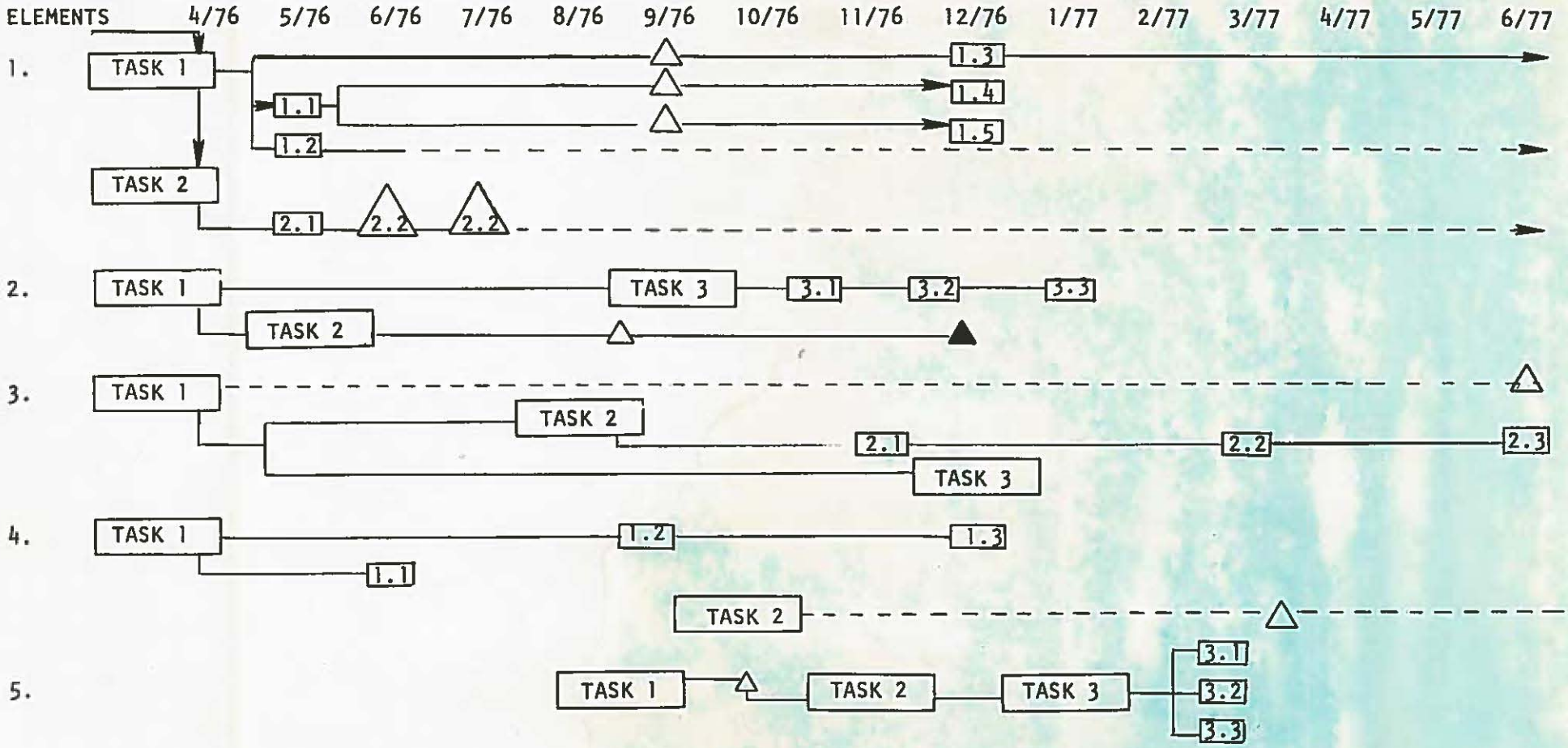
(1) Manpower

Goal: To improve the availability of manpower at the EMT-A and Advanced First Aid/CPR level serving as ambulance attendants.

TASK 1. Introduce the issues to the Fire Chief by outlining the existing problems in the Fire Division and their impact upon the health care system of Guam. The problems to be reviewed with the Fire Chief will be:

- Lack of an adequate selection and promotion process for ambulance attendants.
- Lack of a basic understanding of elementary emergency medical conditions and their treatment.
- Lack of medical involvement by GMH and its medical staff.

# A SCHEMATIC OF THE IMPLEMENTATION PLAN FOR THE PERIOD APRIL 1976 TO MARCH 1977

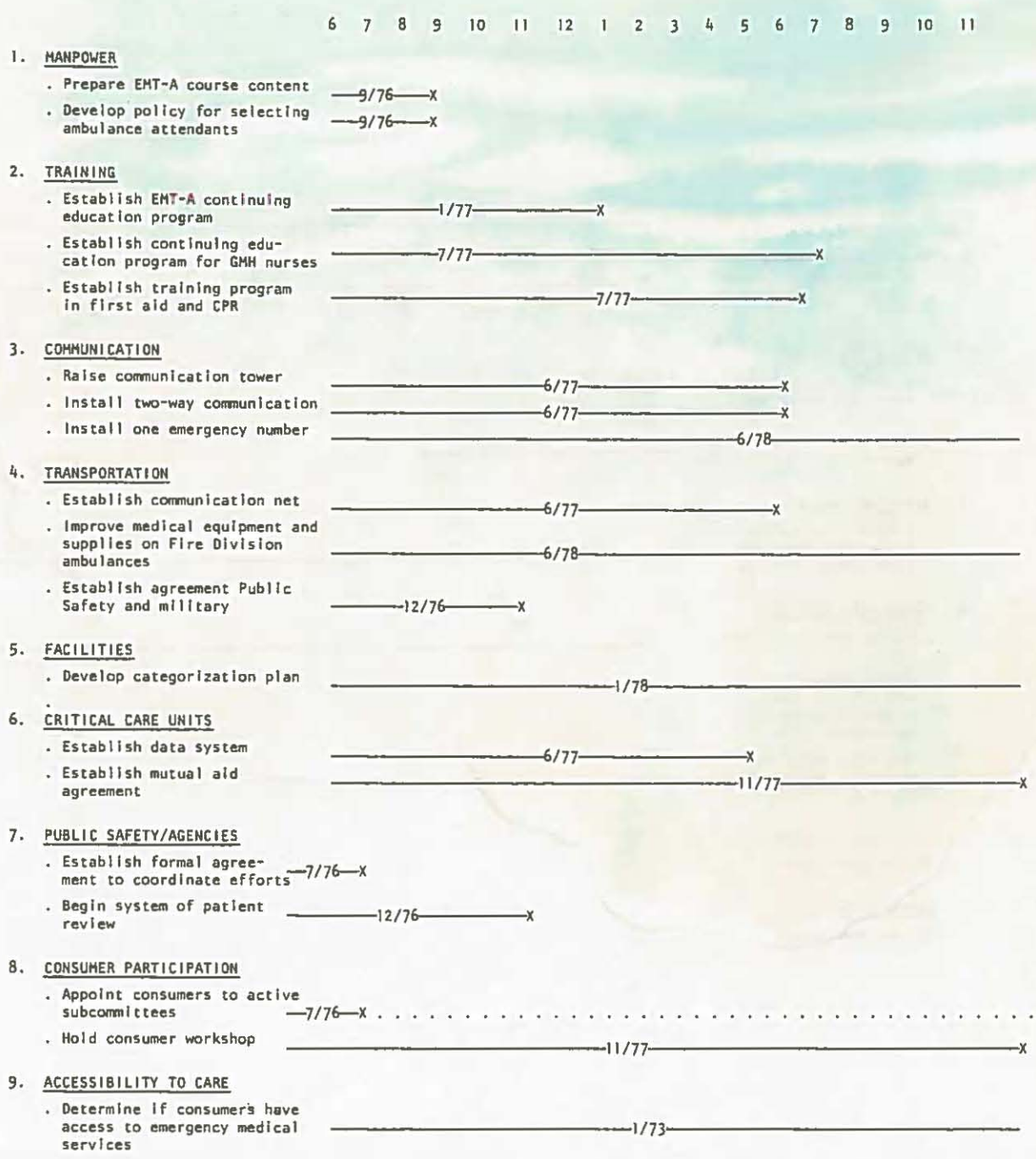


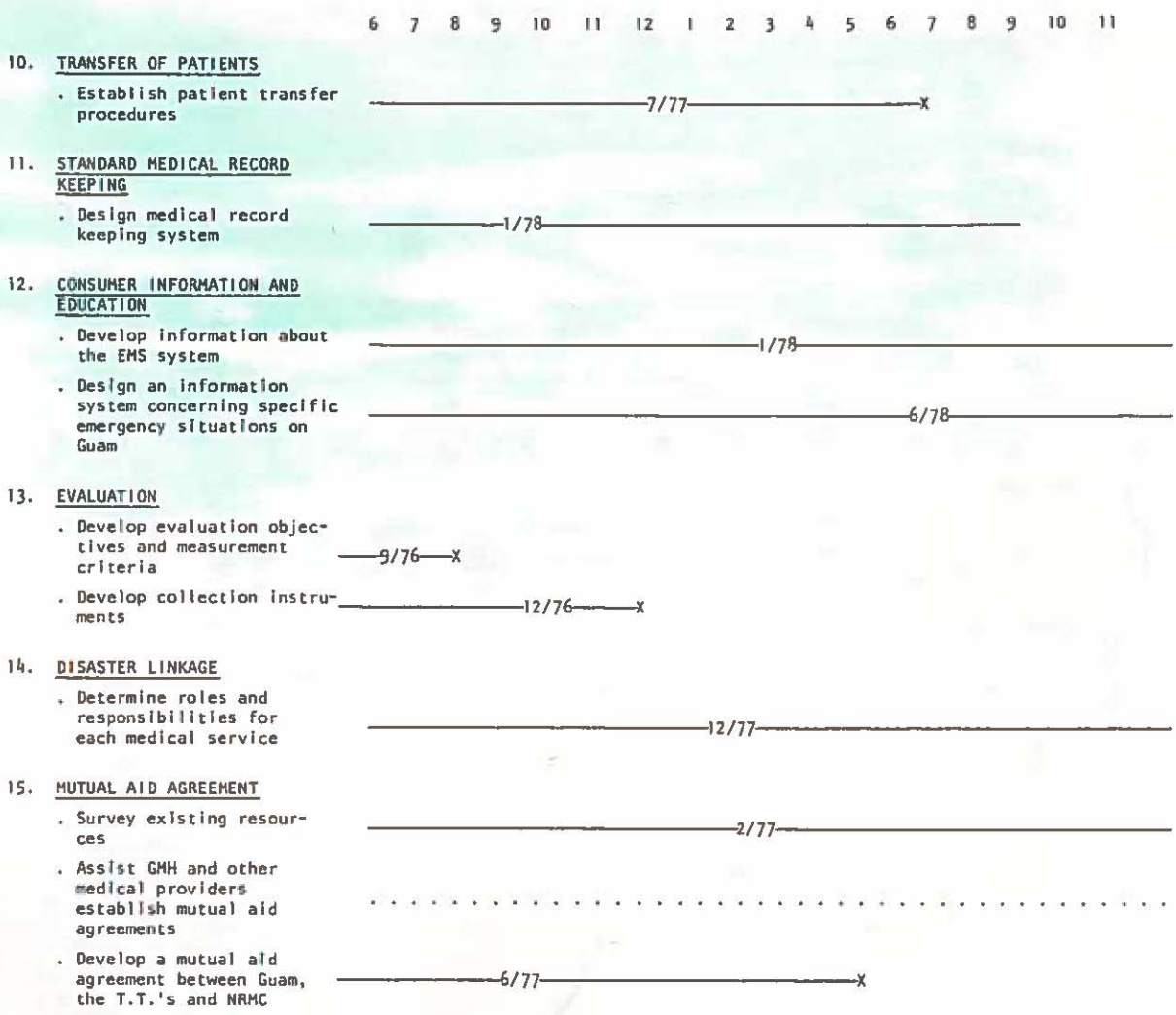

△ = Mile Stone

▲ = Assess Product

EXHIBIT XVIII

# TIME FRAME FOR COMPLETING OBJECTIVES




6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11
10. TRANSFER OF PATIENTS
. Establish patient transfer procedures
7/77
X
11. STANDARD MEDICAL RECORD KEEPING
. Design medical record keeping system
1/78
12. CONSUMER INFORMATION AND EDUCATION
. Develop information about the EMS system
1/78
. Design an information system concerning specific emergency situations on Guam
6/78
13. EVALUATION
. Develop evaluation objectives and measurement criteria
9/76
X
. Develop collection instruments
12/76
X
14. DISASTER LINKAGE
. Determine roles and responsibilities for each medical service
12/77
15. MUTUAL AID AGREEMENT
. Survey existing resources
2/77
. Assist GMH and other medical providers establish mutual aid agreements
. Develop a mutual aid agreement between Guam, the T.T.'s and NRMC
6/77
X
16. EMS SYSTEM MANAGEMENT
(To be developed)
17. LEGISLATION
(To be developed)

Sub-tasks will include:

1.1 The EMS Coordinator will work with the Fire Chief in assigning a senior member of the Fire Division's staff to direct the ambulance services and coordinate the future development of ambulance attendants to become certified EMT-A's.

1.2 The EMS Coordinator will work with GMH, UOC, and the physicians on Guam to assure adequate training in the diagnosis and treatment of emergent medical conditions.

1.3 The EMS Coordinator will work with UOG on a continuing basis to assure that an adequate knowledge of basic health sciences are included in course content.

1.4 The EMS Coordinator will assist the Fire Division in establishing a working environment which involves working as a fireman as well as an ambulance attendant.

1.5 The EMS Coordinator will assist the Fire Division in establishing selection criteria based on aptitude and attitude.

TASK 2. Maintain contact with the Fire Chief through regularly scheduled meetings.

2.1 The EMS Coordinator will determine the nature and scope of these meetings with the Fire Chief and his senior staff representative. These meetings should include the following subject areas:

- Manpower
- Training
- Communication
- Equipment
- Medical Call

2.2 The EMS Coordinator will maintain contact through formal meetings and reports to the Fire Chief.

(2) Training

Goal: To provide appropriate training and continuing education for Hospital Emergency personnel, ambulance attendants, police officers, fire fighters, lifeguards, and other public safety personnel.

TASK 1. The EMS Coordinator, through the EMS Advisory Board, will establish a training committee composed of health consumers, providers and educators. Their objective will be to develop the learning objectives, course content and field experience necessary to assure successful completion of the certification examination.

TASK 2. Working with the committee the EMS Coordinator will develop a program outline which provides:

. Pre-testing of students

. An introduction to basic life sciences

. Core material in diagnosis, treatment and extraction procedures of the emergent patient

. Hospital emergency room practicum

. Field experience as an EMT-A trainer in the ambulance

. Testing of the student's understanding and knowledge of curriculum material and field experience

. Continuing education in basic/essential EMT-A functions, after graduation and certification.

TASK 3. The EMS Coordinator working through the EMS Advisory Committee will establish EMT-A certification standards to be met by graduates of the EMT-A course.

3.1 Working through the training committee the EMS Coordinator will develop standards and criteria for certification.

3.2 The EMS Coordinator will design a written and field experience examination for certification of EMT-A's.

3.3 The EMS Coordinator will, through the training committee with the endorsement of the EMS Advisory Committee, establish a time frame including number of students to be certified. All Fire staff will be functioning as EMT-A certified by 1980.

(3) Communication/Transportation

Goal: To improve the existing communication system by assuring interface with the hospital base station, military

ambulances, fire, police, civil defense and other public and private agencies.

Goal: To improve the coordination of air, land, and sea transportation services between the military and civilian organizations.

TASK 1. The EMS Coordinator will monitor the installation of the 200 foot communication tower.

TASK 2. The EMS Coordinator will assist in the establishment of a compatible two-way radio communication system.

2.1 The EMS Coordinator will identify principals involved in the utilization of communication equipment. An initial summary includes:

- NRMC
- GMH
- Air Force
- Fire Division
- Police Division
- Civil Defense

2.2 The EMS Coordinator will establish a method by which all parties will participate in the installation and utilization of the communication equipment.

2.3 Install two-way communication equipment.

TASK 3. The EMS Coordinator will establish an agreement between the Department of Public Safety and the Commander of NRMC concerning the role and responsibility of their ambulances.

(4) Evaluation

Goal: To establish evaluation objectives which measure the effectiveness of the EMS system.

TASK 1. Determine EMS objectives and measurement criteria.

1.1 The EMS Coordinator will establish an evaluation committee to develop evaluation objectives and measurement criteria for the following areas:

. Hospital emergencies
. Ambulance runs
. Automobile accidents

1.2 The EMS Coordinator will assist the committee in selecting data elements based upon the measurement criteria.

1.3 The EMS Coordinator will develop the collection instruments.

TASK 2. The EMS Coordinator will implement the evaluation and the committee will monitor and assess the outcome of the evaluation.

(5) EMS System Management

Goal: To establish an organization system for planning, implementing and operating the EMS program through the various public and private agencies on Guam.

TASK 1. Identify the various public and private agencies involved in emergency medical services.

TASK 2. Determine their role and responsibility.

TASK 3. Establish an organization scheme for the purpose of assuring an effective EMS Plan as well as the successful implementation and operation of the program.

3.1 Identify the functions of each agency involved in the organization scheme.

3.2 Identify individuals who will represent each agency in completing this plan.

3.3 Develop a management scheme to assure proper communication and coordination of the organizations involved.

2. STAFFING

Due to recent changes in staffing of the Office of Comprehensive Health Planning and the combining of EMS Planning duties of the EMS Coordinator between the Department of Public Health and Social Services and the Department of Highway Safety, it is

important that the management of the system be agreed to prior to submitting an application for P.L. 93-154, Section 1203 funds.

The initial work plan was designed to be achieved by the EMS Coordinator. Technical assistance will be required to provide the EMS Coordinator adequate information and direction in implementing the initial work plan as well as subsequent efforts. This is especially important since the expanded role of the EMS Coordinator includes the drafting of a transportation element to the EMS Plan for the Office of Highway Safety.