DTIC FILE COPY

(1)

SECURITY CLASSIFICATION OF THIS PAGE

REPORT ...	Form Approved OMB No. 0704-0188
1a. REPORT SECURITY CLASSIFICATION: N/A	IVE MARKINGS
2a. SECURITY CLASSIFICATION AU: N/A	ION/AVAILABILITY OF REPORT
2b. DECLASSIFICATION/DOWNGRA: N/A	Unclassified unlimited
4. PERFORMING ORGANIZATION RE... NUMB...S): 22-90	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION: USA MEDDAC, Fort Polk, LA 71459-6000	6b. OFFICE SYMBOL (If applicable)
7a. NAME OF MONITORING ORGANIZATION: U.S. Army-Baylor University Graduate Program in Health Care Administration	
6c. ADDRESS (City, State, and ZIP Code)	7b. ADDRESS (City, State, and ZIP Code): AHS, San Antonio, TX 78234-6100
8a. NAME OF FUNDING/SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (If applicable)
9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS: PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

AD-A226 550

11. TITLE (Include Security Classification)
EFFICIENT RESOURCE UTILIZATION IN THE BAYNE-JONES ARMY COMMUNITY HOSPITAL EMERGENCY ROOM

12. PERSONAL AUTHOR(S)
SWIDERSKI, Frederick Allen

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
FINAL	FROM 7-89 TO 7-90	1990, August 7	91 + APPENDICES

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Efficient; Resource Utilization; Emergency Room

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Prolonged waiting time in medical settings causes dissatisfaction with care and low compliance with provider recommendations and acts as a barrier to access. Delays in receiving emergency care may lead to the deterioration of severely ill patients. To minimize the amount of time patients wait to receive care in the Emergency Room (ER) and the length of their overall stay, hospital administrators must ensure the adequate supply and efficient use of ER resources. This management project looks at the amount of time patients spend for an ER visit at the Bayne-Jones Army Community Hospital (BJACH) given the current level of physician, nurse, paraprofessional, and bed resources. Information about patient care activities was obtained from randomly selected medical records and by conducting a time-in-motion (TIM) study of the BJACH ER. A "turnaround time" study was also performed on the Departments of Pathology and Radiology to examine the effects of these ancillary services
(continued)

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION	
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	N/A	
22a. NAME OF RESPONSIBLE INDIVIDUAL: Frederick A. Swiderski	22b. TELEPHONE (Include Area Code): (318) 535-3102	22c. OFFICE SYMBOL: HSXV-DCA

DD Form 1473, JUN 86 — Previous editions are obsolete. — SECURITY CLASSIFICATION OF THIS PAGE

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

90 09 05 106

BLOCK #19 (continued)

on ER patients' visits. Information about the resource level and from the TIM and turnaround studies were used to construct a computer simulation model of the BJACH ER. The number of physicians, nurses, paraprofessionals and beds were varied to analyze their effects on ER patients' visit times. The study revealed that while changing the number of nurses, paraprofessionals and monitor/trauma beds had very little impact on the total amount of time a patient spent in the ER, increasing the number of physicians or regular beds did have a significant effect.

EFFICIENT USE OF EMERGENCY ROOM RESOURCES AT BAYNE-JONES HOSPITAL

A Graduate Management Project

Submitted to the Faculty of

Baylor University

In Partial Fulfillment of the

Requirements for the Degree

of

Master of Health Administration

by

Captain Frederick A. Swiderski, MS

June, 1990

Acknowledgments

There were a number of individuals who contributed to the design, development and completion of this project who I would like to acknowledge. Foremost is my wife Ann, whose moral support of my efforts and tolerance of my many absences from home made it possible for me to devote an enormous amount of time to this endeavor. Next, I would like to express my thanks to two U.S. Army-Baylor instructors, Majors Darryl Stafford and Jose Galarza, who provided me with assistance throughout the entire residency year. Major Galarza's expertise was crucial in the design of the computer simulation model and the interpretation of its results. His patience in answering a constant barrage of questions from me has not gone unnoticed. I am grateful to the MEDDAC Commander, Colonel Fred Cecere, who afforded me the opportunity to explore a critical management issue and has agreed to allow me to implement my recommendations. I would like to express my gratitude to the entire Emergency Room (ER) staff who permitted my intrusion into their work area and allowed me to observe and question them about the many inner-workings of the ER. Special thanks go to Captain Barry Sheridan (Chief of Emergency Services), Majors Christine Inoyue and Leland Jurgensmeir (ER Head Nurses) and SFC Randall Chambers (ER NCOIC). Also I would like to thank Mr. Walter Thompson from the MEDDAC Information Management Office who generated many AQCESS ad-hoc reports used to build and verify my simulation model. Finally, I would like to thank the individual who had the most impact on the success of this project, the Deputy Commander for Administration, Colonel Douglas A. Barton. Having graduated from the U.S. Army Baylor Program, Colonel Barton was aware of the importance of the Graduate Management Project (GMP). He provided me with a challenging organizational problem and the latitude to use my creativity to develop a solution. He eliminated organizational obstacles which might otherwise have hampered my progress and was a constant source of guidance and direction. Without a doubt, much of the success of this project can be directly attributed to the relentless support provided to me by my preceptor and friend, Colonel Douglas A. Barton.

Abstract

Prolonged waiting time in medical settings causes dissatisfaction with care and low compliance with provider recommendations and acts as a barrier to access. Delays in receiving emergency care may lead to the deterioration of severely ill patients. To minimize the amount of time patients wait to receive care in the Emergency Room (ER) and the length of their overall stay, hospital administrators must ensure the adequate supply and efficient use of ER resources. This management project looks at the amount of time patients spend for an ER visit at the Bayne-Jones Army Community Hospital (BJACH) given the current level of physician, nurse, paraprofessional, and bed resources. Information about patient care activities was obtained from randomly selected medical records and by conducting a time-in-motion (TIM) study of the BJACH ER. A "turnaround time" study was also performed on the Departments of Pathology and Radiology to examine the effects of these ancillary services on ER patients' visits. Information about the resource level and from the TIM and turnaround studies were used to construct a computer simulation model of the BJACH ER. The number of physicians, nurses, paraprofessionals and beds were

varied to analyze their effects on ER patients' visit times. The study revealed that while changing the number of nurses, paraprofessionals and monitor/trauma beds had very little impact on the total amount of time a patient spent in the ER, increasing the number of physicians or regular beds did have a significant effect.

TABLE OF CONTENTS

LIST OF TABLES PAGE

APPENDIX

Introduction

Despite an increase in budget dollars and personnel allocations over the past decade, future constraints on Department of Defense monies could have an adverse impact on the availability of resources for Military Medical Treatment Facilities (MTFs). Efforts to recruit and retain physicians, nurses, and paraprofessionals (licensed practical nurses (LPNs), licensed vocational nurses (LVNs), Emergency Medical Technicians (EMTs), and nursing assistant/aides (NAs)) have not been able to produce anticipated levels of staffing. Personnel shortages, particularly in nursing and ER technicians, have decreased the number of qualified individuals available to work in the ER environment. Demands for high-tech equipment and labor intensive services continue to lead ER operational requirements. Moreover, the ER often serves as a "back door" into the military health care system for many beneficiaries, many of whom might be cared for more appropriately by routine appointment to various clinics. Inappropriate utilization of the ER, coupled with ER personnel shortages, result in longer patient waiting times.

Table 1 shows the number of patients who presented seeking medical care and those who were treated in the BJACH ER between May and September, 1989 (Appendix A). The difference represents patients who came to the ER and were subsequently referred to another clinic for treatment. Additionally, the percentage of treated patients whose visit time (VT) exceeds 180 minutes is also displayed.

Table 1 - Patients Who Presented, Those Treated and % VTs Exceeding 180 Minutes (May - Sep 89)

	Total Presented	Total Treated	% VT > 180 min
May 89	1245	1062	9.3
Jun 89	1229	1064	17.7
Jul 89	1183	1029	8.6
Aug 89	1187	1045	14.4
Sep 89	1189	1035	11.9
Mean	1207	1047	12.4
StdDev	28	16	3.8

NOTE: The focus of this study is limited to the weekday (Monday through Friday) evening shift (1500 to

2300). Reasons for the selection of this time period are discussed in the Data Collection portion of this paper.

Over this 5 month period, an average of 12.4% of the patients who were treated spent over 3 hours before being dispositioned (admitted, transferred or discharged). According to the patient representative, the ER staff, and MEDDAC headquarters, some patients complained that the wait was too long before receiving care and being dispositioned. The MEDDAC Commander (Colonel Fred A. Cecere) believed that although some of this time was spent providing hands-on treatment, much of the patient's ER visit was spent waiting for his first encounter with a health care provider. In an effort to reduce this time, the Commander took the following actions. First, he directed that Resource Management Division (RMD) initiate a contract to hire physicians to augment the ER staff. Second, the Commander placed a limit of three hours on the time a patient should spend in the ER before being dispositioned. His intent was to transfer out of the ER those patients who could be more appropriately medically managed on the ward or discharged, and "free up" their occupied beds for patients waiting to be

seen. Finally, Colonel Cecere directed the formation of the Non-Urgent Care Clinic which opened on October 2, 1989. The Non-Urgent Care Clinic evolved through a "Partnership Agreement" between the MEDDAC, Fort Polk and Sterling Emergency Medicine Inc. (a health care provider agency). According to the Memorandum of Understanding (Appendix B) Sterling supplied the individual providers, and the nursing and clerical personnel necessary to provide General Medical service for Civilian Health and Medical Programs of the Uniformed Services (CHAMPUS) eligible beneficiaries. The hospital commander provided the facility, anciilary and administrative support, diagnostic and therapeutic services, and equipment and supplies necessary for the proper care and management of patients. The clinic operated from 1500 to 2300 on Mondays through Fridays.

The effects of the above initiatives were reflected in a lower average mean percentage (7.9%) (Table 2) of patients whose visit time exceeded 180 minutes during October 1989 through March 1990 (Appendix C). By increasing the number of providers and operating the Non-Urgent Care clinic during the evening hours, Colonel Cecere improved the access to health care for many Fort Polk beneficiaries and fewer

patients on average had ER visit times in excess of 3 hours.

Table 2 - Patients Who Presented, Those Treated And % VTs Exceeding 180 Minutes (Oct'89 - Mar 90)

	Total Presented	Total Treated	% VT > 180 Min
Oct 89	1390	948	4.2
Nov 89	1305	793	6.6
Dec 89	1171	647	7.7
Jan 90	1705	995	12.4
Feb 90	1268	793	5.5
Mar 90	1438	872	10.8
Mean	1389	841	7.9
StdDev	184	125	3.2

However, during this period both an increasingly larger number of patients presented to the ER and a trend towards a higher percentage of patients whose visit times exceeded 180 minutes was apparent.

The increased rate of utilization may have resulted from a higher rate of use by those

beneficiaries currently receiving care in the ER or by recapturing additional beneficiaries, or both.

These additional beneficiaries are often referred to as a "ghost population." This population is composed of two elements. The first is a group of eligible health care beneficiaries, within a hospital's service or catchment area, who forego health care at that facility for a number of reasons. These include a long traveling distance to the facility, the lack of available transportation, long visit times and an inability to find or afford required baby sitting services. The second element is composed of beneficiaries that have some form of insurance and choose to go to other sources than MTFs, such as to private providers, for some or all of their health care needs. The ghost population surrounding a military medical treatment facility includes some active duty soldiers who are unable or unwilling to seek health care for minor illnesses during duty hours, but are mostly family members (of active duty and retired soldiers) and retired beneficiaries.

I believe the increase in utilization (a larger number of patients presented to the ER from October to March than did from May to October) might partially

represent more frequent use by beneficiaries currently being treated in the BJACH ER. But, a larger portion of increase is due to the recapturing of beneficiaries either foregoing health care or receiving care from private providers. As the news of shorter ER visit times and initiatives to increase access to care continue to spread throughout our beneficiary population, the demand for health care will expand to meet the supply. "The greater the availability of care within the military health care system, the more likely families will use the system" (Congressional Budget Office, 1988, p. xv). Some patients with non-urgent conditions (those which do not require the immediate resources of an emergency medical system) (Appendix D) may choose to seek health care in the Non-Urgent Care Clinic. However, most patients with urgent (those requiring medical care within 12 hours), all emergent (those requiring immediate evaluation) and those not eligible for medical care in the Non-Urgent Care Clinic will have to be treated in the ER. The increased ER census and the higher acuity of some of these patients will place a higher demand on ER resources.

The BJACH executive management must determine the most efficient staffing and number of beds for the

existing ER workload requirements to prepare for the additional health care demands resulting from a larger number of ER patient visits.

Problem Statement

The excessive waiting time to receive treatment at BJACH's ER contributes to long ER visit times and increased patient dissatisfaction with the care. This paper discusses the reasons for these excessive waits and looks at ways to reduce the amount of time patients spend in the ER.

Literature Review

It is difficult for the military to estimate the extent to which its eligible health care beneficiary population makes use of health care services. With few exceptions, active duty soldiers receive their medical care through military medical treatment facilities (MTFs) around the world. However, many families of service members, both active duty and retired, go outside the military system to obtain their health care needs. This is particularly troublesome when "... it costs $1.54 to purchase care from civilian sources and $1.00 for the AMEDD to produce that same level ..." (Modderman, 1989). And much of the dependent and retiree health care costs are paid from sources such as CHAMPUS, Medicare and private insurance. Because these insurance programs greatly reduce the out of pocket costs, non-active duty beneficiaries often consume health care at a much higher rate than their civilian counterparts. "On average they visit physicians about seven times a year; almost one and one half times more than their civilian peers" (Congressional Budget Office, p. xii). The non-active beneficiary's comparatively heavy use of health care and the growing use of

CHAMPUS are two major contributors to the rising costs of military health care.

In an attempt to slow down the growth of military health care costs, the administration has developed a group of initiatives collectively called the CHAMPUS Reform Initiatives (CRIs). The initiatives attempt to develop fixed price contracts with preferred provider organizations (PPOs). "PPOs are groups of providers, both hospitals and physicians, that agree by contract to offer discounted services to purchasers of health care services" (Congressional Budget Office, 1988, p. 37). However, CRI, which provides easier access to health care, has the potential for increasing costs largely because of the ghost population. "Statistical analysis shows that family outpatient patterns ... will change in response to changes in the supply of military health care services" (Congressional Budget Office, 1988, p. xv).

As health care environments become more congested, administrators will streamline the delivery of health care at the institutional level. To meet the increased demands of a larger outpatient population, the delivery of ambulatory care will need to become more efficient. One area of ambulatory care that has come under severe

scrutiny is that of emergency medicine. Because of the uncertainty surrounding the type, number and severity of patients that may present to an ER at any time, it needs to be staffed at levels that enable it to take care of simultaneous crises. However, there are also periods of time when the patient census is low and it may appear to be overstaffed. As a result, ERs are often targeted for resource cuts and efficiency studies.

Efficiency in the ER has a major effect on both the quality of patient care and hospital public relations. Patient flow and waiting times are two methods of defining efficiency, and both have been studied extensively. Excessive ER waiting times may delay the initiation of emergency care, and have been the target of criticism not only from patients, but also from practitioners and administrators. "As patient satisfaction questionnaires often attest, long waits also damage the public image, not just of the ED [emergency department], but of the entire hospital in a time of growing competition among health care providers" (DiMeglio et al, 1989, p. 7).

A review of the current literature reveals structural, patient, and process variables which affect

the patient flow, waiting time and length of an ER patient's visit (Table 3).

Table 3 - Variables Which Impact on an ER Patient's Visit

Structural	Patient	Process
Size/type of ED	Acuity/	Times for:
Layout of ED	Classification	Triage
Staffing Levels	Age	Registration
	Gender	Diagnostic Tests
		Consultation
		Treatment
		Admission
		Discharge

Note. From DiMeglio et al, 1989, p. 8.

Also identified was a powerful management tool, "simulation modeling," which can be used to predict the outcome of alterations made in the ED variables without actually disrupting the ED. Note: Most Army community hospitals are not large enough to support an emergency department and usually have an emergency medicine service or emergency room as part of the Department of Primary Care and Community Medicine. However, the

literature often refers to an emergency department which can be found in both large and small civilian hospitals. Therefore, the terms emergency room (ER) and emergency department (ED) will be used synonymously in this paper.

Structural Variables

Size and type of emergency department. A study by Cue & Inglis (1978) found that a patient's use of emergency services and the urgency of his medical condition vary greatly among hospitals. For example, the number of patients visiting urban emergency departments was three times greater than the number visiting suburban emergency departments. One explanation for the disparity in patient usage is the difference in availability of physicians between urban and suburban areas. "Urban and small community families depend more on the hospital emergency department for routine medical care while suburban families rely more on private physicians for routine care and use emergency departments only for true emergencies" (DiMeglio et al, 1989, p. 8).

The same study classified patients according to treatment urgency. Symptoms which required a timely use of staff and facilities were classified as acute.

Symptoms not indicating immediate treatment were classified as less acute. Emergency departments in urban hospitals were found to have a larger proportion of less acute patients than suburban hospitals. This difference may be attributed to a larger population using the emergency department for episodic care. Only a small portion of acute visits in this study were for life threatening symptoms. The remainder were for less serious conditions, such as uncomplicated fractures and limited burns.

Layout of the ED. The study by Cue and Inglis (1978) examines the layout of an emergency department (ED). "A well designed ED facilitates prompt patient treatment and high staff productivity" (DiMeglio et al, 1989, p. 9). The authors suggest several design features to aid in prompt patient treatment and increase staff productivity. One feature suggested is open bay treatment cubicles to maximize space utilization and staff accessibility to patients. Cases which require privacy, such as OB-GYN, psychiatric or intoxicated patients, will necessitate different arrangements. Another suggestion is a centrally located nurses' station in conjunction with open bay cubicles, facilitating patient observation and

decreasing distances traveled by the nurse. Cue and Inglis (1978) recommend locating the ED near the radiology department to reduce demands on the staff for transporting patients and maintain close coordination between the two departments.

Two other recommendations include the addition of holding areas: one for ambulatory patients and one for stretcher patients. These areas will allow patients waiting for tests to make available cubicles and treatment areas. Other desirable design features include a close proximity to the laboratory and the registration desk and a direct view of the ED entrance by the triage nurse.

Staffing levels. Inadequate staffing prolongs patient waiting times and may delay needed treatment. Careful planning and scheduling are required to meet various patient visit demands in an ED. Cue and Inglis (1978) examined the effect of staff workload on treatment times. Staff workloads were measured in terms of visits per staff hour, and calculated by dividing the average number of visits for an eight hour shift by the number of staff hours provided during that shift. "Results indicated that a ratio of three to four patients per physician hour for the day and

evening shift represented a reasonable workload for non-teaching hospitals with overall visit volumes of 20,000 or more" (DiMeglio et al, 1989, p. 10). A workload of 1.5 visits per nurse hour was recommended for all shifts. However, the appropriate number of nurses in an ED is not just dependent on patient volume. It is also dependent on the availability of other patient care staff and additional responsibilities of the nursing staff, such as administrative tasks.

Patient Variables

Acuity and classification of patients. Emergency room patients may be classified in a number of ways. The most common classification is based on the urgency of care required. The patient is identified as non-urgent, urgent or emergent. Patients may also be further classified based on their diagnosis or resource utilization requirements. The resource utilization or diagnosis based systems assign numerical values. The higher the acuity level, the higher the numerical code and the amount of care required increases. One example of a resource utilization classification system, described by Buschiazzo (1984), is based on nursing time requirements as seen in Table 4.

Table 4 - Patient Categorization System

Category	Description
1	Minor illnesses & injuries; requires 15 minutes of nursing time; treated & released.
2	Lacerations, fractures; 30 minutes of nursing care/hour; moderate care.
3	Acute asthma, chest pain, head injury, gastrointestinal bleeding or seizure; 42 minutes of care/hour; may require two nurses to stabilize, then extended care.
4	Major trauma, cardiac arrest, shock; 72 minutes nursing care/hour; two nurses for stabilization followed by careful and frequent monitoring.
5	Similar diagnoses to 4; 84 minutes of nursing care/hour; minimal care by two or more nurses. (Buschiazzo, 1984)

Patient acuity is often thought to impact on a patient's visit time in an emergency room. That is, the higher the patient's acuity, the longer the time spent in the ER. However, a study conducted by Wilbert (1984) found that the increased severity of the patient's condition alone did not extend the total

visit time. Patients with a visit time of greater than four hours appeared to be affected by multiple factors, to include: a higher acuity level, the number of laboratory or x-ray tests requested, the requirement for consultation, and arrival on weekends during the day or night shift. This study concluded that the availability of diagnostic and consultant services, which varies by shift and on weekends, was the most significant factor affecting patient lengths of stay greater than four hours.

A study by Saunders (1987) looked at sources of delay in the ED relating to patient acuity. It was found that the more critical patients moved more quickly through the ED than those who were less acute. This finding suggests an emergency care system oriented toward the efficient care of high acuity patients. Unfortunately, the vast majority of the ED census is made up of lower acuity patients for whom delay was a frequent source of patient dissatisfaction. Saunders' study took place in a busy teaching hospital which aims its efforts at critical patients. However, that same ED is heavily used by an urban population seeking episodic primary care. Saunders' study proposed some methods to improve efficiency of patient flow. The

suggestions included: improving laboratory turnaround times; limiting non-essential tests; creating triage nurse protocols to order x-ray and lab tests; creating an independent "fast track" responsible for low acuity patients; and increasing physician or nurse staffing during peak hours (Saunders, 1987, p. 1247).

Process Variables

DiGiacomo (1982) found that a patient spends an average of 59% of his or her time in the ED system being treated; 41% waiting. The waiting time is spent in various steps in the ED process and represents a collection of time periods.

The ED process must be partitioned into its various component parts to identify the reason(s) for prolonged stays in the ED. Researchers often speculate that a patient waits longer for treatment when the average daily census in the ED is high. However, DiGiacomo (1982) found that only 15% of the variance in visit time can be explained by hourly patient arrival rates. Because the daily census and arrival rates are not independent variables, and the variance attributed to each is not usually additive, DiGiacomo concluded that no more than 37% of the total variation in visit time can be attributed to a combination of hourly

patient arrival number and total daily census. Other factors contributing to the variation in waiting time include an inadequate number of admission registrars, reduced staff during meal times, and too few physicians during periods of high patient census. The unpredicted arrival of critical patients preempting care from less severe patients and delays in admission also contributed to the variance.

A study by Smeltzer and Curtis (1986) divided the ED patient total lengths of stay into processing components. They found that the average time spent in triage was 15.38 minutes. Triage included registration, the initial assessment, and arrival in the examination/treatment room. The average time spent in the examination/treatment room until disposition was 127 minutes. Treatment included contact with the physician, consultation, diagnostic testing, and arrangement for inpatient admission. The average time from completion of disposition to discharge was 10 minutes.

Total ED visit time varies by the type of hospital (urban, teaching, or suburban). But, in general, the average patient spends about 2.5 hours (150.16 minutes) in the ED (Smeltzer, 1986). A "time study" conducted

by Thorpe (1972) found mean visit times of 135.9 minutes for patients who required both lab and x-ray studies and physician consultation; 87.1 minutes if only physician consultation was required; 74.4 minutes if only lab/x-ray were required; and an average visit time of 51.8 minutes if the patient had neither studies nor consultation.

Diagnostic Testing. Three variables were identified by all studies as extending the length of visit time: diagnostic testing, consultations and level of patient acuity. Of these three variables, laboratory turnaround times are perceived by ED staff as prolonging ED visits the most. Average laboratory turnaround times varied from 77 minutes to 1.5 hours in the literature reviewed. According to Cue and Inglis (1978), delays were found to be the result of collecting and transporting specimens, obtaining priority for ED tests over routine tests, and relaying the laboratory results to the physician.

Radiology tests are also used for diagnosis in the ED. Smeltzer and Curtis (1987) found that 40% of ED patients have x-rays and the average length of time for these tests was 69 minutes. Heckerling (1984) found that only 57% of patients requiring x-rays were

released in less than two hours. Wilbert (1984) identified 24% of his study population as receiving x-rays. On average, it took 23 minutes from the time ED patients were transported to radiology until they returned to the exam room. Seventy-four percent of those results were available within 28 minutes of the patient's return to the ED, for a total procedure time of 51 minutes.

Consultation Time. Often an ED physician requires consultation by a specialist. Wilbert (1984) found that while consultations affected only a small percentage of patients, they are costly in terms of patient time. The average wait for arrival of a consultant ranged from 31 minutes to 190 minutes. The findings indicated that 35% of consult time was actually spent waiting. Of those patients whose visit time was greater than four hours, 49% had consultations. This is in contrast to those patients whose visits lasted less than four hours where only 12% received consultations.

Admission time. Admission time is another variable believed to impact on a patient's ED visit time. Admission time begins with the decision to admit and ends with his transfer to a hospital bed.

Heckerling (1984) found that approximately 50% of patients who were admitted waited 1.5 hours to be transported from the emergency room to a hospital bed. Because 20% of this hospital's patients were admitted from the ED, a significant portion of patients are delayed by long admission times. No reasons or solutions were provided in Heckerling's study to reduce the prolonged admission times.

Time Studies. Time studies of patient flow through emergency services are helpful in revealing important sources of delay in receiving medical care, particularly for patients with problems deemed most urgent. Such studies have resulted in findings which led to shorter patient visit time in EDs. DiGiacomo & Kramer's study (1982) cited an inadequate number of admitting registrars as having an adverse effect on patient flow, particularly during late afternoon and early evening hours. A recommendation was made for an additional admitting registrar to be placed on the 3PM to 11PM shift. Another problem prolonging patient visit times was the demands made on the ED staff and bed space by patients waiting to be admitted to an inpatient unit. This problem was resolved by assigning

"floating" staff members to a holding unit during periods of high volume each day.

Smeltzer and Curtis (1987) found that patients with lower acuity codes had shorter visit times. This was attributed to a newly implemented "fast track" system which assigned those who did not need extensive treatment to a designated nurse and physician for diagnosis and treatment. An earlier study (Smeltzer and Curtis, 1986) implemented a program in which the charge nurse made rounds of examination and treatment rooms every half hour to give each patient an update on his or her disposition, including time left to wait for laboratory or radiology results or for a consulting physician. Positive attitudes and attentiveness from staff were identified as methods to reduce patient anxiety and anger resulting from long waiting times. Using time studies to examine the ED patient flow-through process can provide valuable information which can be used to streamline the process, thereby increasing patient satisfaction and decreasing an ED patient's visit time.

Simulation Modeling

Operations research examines the consequences of restructuring an operating system without actually

altering it. This management technique identifies a more efficient use of resources within the health care delivery system resulting in a reduction of costs and an improved quality of service. Other methods used to analyze the health care delivery process are motion, time, and method (MTM) studies, queuing models, and relatively simple computer simulation models. "Although MTM and queuing models can define the health care delivery process and suggest inefficiencies, they can shed little insight into the system-wide effects of manipulating the system because they tend to ignore interactions among subsystems" (Saunders et al, 1989, p. 37).

Emergency departments have been studied using MTM and queuing techniques. However, these methods are of limited usefulness for large departments because of certain ED characteristics, such as queue reneging (a patient chooses to leave rather than continue to wait), preemptive priorities (a patient waiting for treatment is "bumped" by another with a higher medical priority), or a need for multiple servers (a physician, and/or nurse, and/or paraprofessional) by a single patient. Additionally, patients randomly arrive at an ED

requiring different degrees of care based on their varying levels of acuity.

Computer simulation more accurately models systems with transient (nonequilibrium) conditions by using historical data to generate random patient arrival and service times with realistic statistical distributions. "Random arrival and service times are used to account for variations in the actual individual service times (splinting a leg, dressing a wound) and patient arrivals. Simulation is an ideal tool for predicting the results of system alterations" (Saunders et al, 1989, p. 37-38).

In essence, a simulation model is a detailed description of the system under investigation that traces the flow or activities through or within that system according to a set of rules. The complexity of the model generally requires the use of a mainframe computer, but software packages are now available for personal computers (Klafehn et al, 1989). A simulation is begun with the construction of a flow chart that depicts the resource and service activity provided by the system under investigation. This flow chart guides the development of the simulation model. After verifying that the model accurately depicts the present

operation, experimentation with the model in the form of "what if" questions can be undertaken.

A computer simulation model of ED operations by Saunders et al (1989) tracks individual staff members and patients. Numerous levels of patient acuities, common laboratory and consultant procedures, and patient care processes may proceed simultaneously, sequentially, or repetitively. Input data probability distributions include patient arrival times, triage acuity category assignments, tests and procedures performed, and diagnoses. Output data include patient waiting times and queue lengths at key stations or groups of stations, utilization rates for various personnel and resources, and patient throughput times. This model allows systematic variation of selected ED resources to demonstrate the effect on patient waiting times and rates of resource utilization. Findings include a direct correlation between patient acuity and visit time. Visit time increases with the patient acuity level as a direct result of an increased number of tests, procedures, and consultations. Increasing the number of staff decreases patient throughput time, up to a point, then no further decrease is found. This results from a rapid decline in staff utilization rate.

The utilization rate relates to the availability of a resource (physician, nurse, clerk, bed) and the amount of time that it is kept busy. This study also finds that increasing the number of examination beds has no effect on patient throughput times. Hematology turnaround time was found to have a direct effect on patient throughput times and on the size of the patient queue waiting for laboratory tests.

Computer simulation has been demonstrated in the literature to have the flexibility to model the complex features of an ED. Its flexibility and ease of use make simulation modeling a valuable management decision making tool.

Purpose Statement and Objectives

This study is concerned with the efficient use of physician, nurse, paraprofessional and bed resources to minimize the visit time of ER patients at Bayne-Jones Army Community Hospital.

The following approach was used to conduct this study:

1. A literature review was performed to identify different variables which affect the length of ER patients' visit time and to explore the phenomenon of a ghost population.

2. A time-in-motion (TIM) study was conducted to examine the patient flow through the ER.

3. A computer simulation model of the BJACH ER was constructed using the SIMAN language (Appendix E).

4. Information obtained from the TIM study was incorporated into a computer simulation model to assess the effects of changing resource levels or increasing the number of patients treated in the ER on patient visit time.

5. The distribution of existing personnel and bed resources was identified which minimized the visit time of current ER patients.

6. A 20% increase and a 30% increase in treated ER patients were simulated to determine their effects on the patients' average ER visit time.

Background

Fort Polk is the home of the 5th Infantry Division (Mechanized) and requires unique medical services affiliated with its Forces Command (FORSCOM) and "divisional post" status. Due to a large and relatively young combat arms active duty and dependent population, certain medical services, such as orthopedic, social work, psychiatry and gynecology/obstetrics, are in greater demand.

Installation support systems include family member employment assistance, outdoor and indoor recreation centers, and a large number of religious services. Fort Polk is augmented by a very sound community support system that includes special education programs for mentally, physically and emotionally handicapped individuals, and a food stamp program for low income households.

BJACH, with an operating capacity of 169 beds, is the largest portion of the Medical Department Activity (MEDDAC). The present hospital was opened in August, 1983 and is fully accredited by the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO). The extent of services and capabilities fluctuates according to the availability of physicians, specialists, and other staff members. Specialties currently available include Family Practice, Aviation Medicine, General Surgery, Orthopedics, Psychiatry, Social Work Service, Otorhinolaryngology, Obstetrics and Gynecology, Podiatry, Ophthalmology, Optometry, Physical Therapy, Occupational Therapy, Audiology, Preventive Medicine, and Clinical Dietetics.

The BJACH ER is classified by the JCAHO as a Level III emergency department. This classification requires

that the "emergency department/service offers emergency care 24 hours a day, with at least one physician available to the emergency care area within approximately 30 minutes through a medical staff call roster" (Accreditation Manual for Hospitals, 1989, p. 41). Specialty consultation is available at the request of the attending medical staff member or by transfer to a designated hospital where more definitive or tertiary care can be provided.

The Emergency Room is composed of a nine bed area which includes two monitor beds, two trauma beds (with monitoring capability), one gynecological/obstetric bed, one splint/cast bed and three routine exam beds. Approximately 35,000 to 40,000 patients with trauma, resuscitative, and general non-surgical problems are treated annually. Examinations, diagnostic and therapeutic test result assessments, and procedures related to the management of trauma injuries are performed on the patients by the physician in the examining rooms.

Staffing

During the periods 4-8, 11-15, and 18-22 December 1989, there were an average of 2.5 physicians that provided 24 hour coverage. With few exceptions,

military coverage was provided 24 hours a day (Appendix F). Civilian contract physicians augmented the schedule during portions of the 0800 to 2400 time period (Appendix G). All of the civilian contract physicians are board certified or board eligible in emergency, internal or family practice medicine. One of the three military physicians is board certified by the American College of Osteopathic Board of General Practitioners and the other two are general practitioners.

The nursing and paraprofessional staff include registered nurses (RN), emergency medical technicians (EMTs), licensed practical nurses (91C), medical specialists (91B), medical attendants (91A), and nursing assistants (Appendix H). Their average 24 hour staffing levels (11 - 15 December 1989) are shown in Table 5.

Table 5 - Nurse and Paraprofessional Work Schedule

	RN	LPN*	91B	91A	NA*	EMT*
Day	1	2	2	0	0	2
Eve	1	1	1	3	2	1
Night	1	0	1	2	0	3

Note. The asterisk denotes civilian paraprofessionals.

Additionally, there are five clerks/receptionists employed to provide staggered coverage. They greet the patients and operate the ER module of the Automated Quality of Care Evaluation Support System (AQCESS) to generate the automated ER patient information log sheets (SF558) and reports (monitor and evaluation, ad-hoc) for Quality Assurance review.

Treatment Process

Most patients who come to the ER on the evening shift (1500-2300) are initially registered (logged in and demographic information recorded) by a clerk. The clerk ascertains the patient's chief complaint and, if it is not identified as one of the fifteen emergency complaints (acute chest pain, respiratory distress, etc.) (Appendix I) posted at the reception desk which requires evaluation by a provider, nor as an urgent condition determined by the ER Algorithm-Directed Triage System, the patient is sent to an adjacent waiting area. Patients are called to have their vital signs taken and return to the waiting area until their records are triaged to determine if they medically qualify (i.e., triaged as non-urgent patients) to be treated in the Non-Urgent Care Clinic. If also administratively eligible for referral (that is,

eligible to receive care through the CHAMPUS program and registered in the Defense Enrollment Eligibility Reporting System (DEERS), the patients are offered the option of being treated in the ER or the Non-Urgent Care Clinic.

The very seriously ill patients and those who arrive at the ER by ambulance are brought to examining beds immediately. A paraprofessional obtains the demographic information and vital signs, while the nurse and physician perform the necessary triage and stabilization procedures.

When indicated, ancillary tests are ordered, consultations performed and various treatments executed. From the initial physician assessment through the interpretation of diagnostic results until they are admitted, transferred or discharged, patients spend a varying amount of time in the BJACH ER.

Methods and Procedures

Patient Study Sample

The sample consisted of 41 randomly selected Emergency Care and Treatment Records (Automated SF558) on patients treated in the ER during the hours of 1500-2300 on 11-14, 19-20 and 22 December, 1989.

Data Collection

The Hospital Commander (CO), Deputy Commander for Administration (DCA), Deputy Commander for Clinical Services (DCCS), Chief of Emergency Medical Services (CEMS), the ER Head Nurse (HN) and members of the ER Staff were consulted to determine the specific time period for this study. Data from the ER log sheets indicated that too many patient visits during the evening shift (1500-2300), particularly on weekdays, were longer than desired. Between May and September 1989, 12.4% of the patients who were treated in the ER had visit times in excess of 180 minutes (Table 1). The weekday evening shift was selected by the researcher as the time period for the study.

Events Impacting on the Data Collection Phase

Beginning in September and continuing through the end of the calendar year, elements of the 5th Infantry Division (Mechanized) on Fort Polk deployed four times

to Panama and once to the Virgin Islands. The size and frequency of deployments were to increase at the beginning of the 1990 calendar year.

On 30 September 1989, the 12 month contract hiring civilian physicians to work in the BJACH ER expired without a prepositioned follow-on contract. Staff physicians, primarily from the Department of Family Practice, were detailed into the ER until a civilian contract was negotiated.

On 2 October 1989, the Non-Urgent Care Clinic opened and non-urgent, CHAMPUS eligible and DEERS enrolled, health care beneficiaries were given the option of receiving care in either the ER or the Non-Urgent Care Clinic (Appendix J). A 30 to 60 day period was granted to the newly assigned Family Practice physicians working in the ER, and to the Non-Urgent Care Clinic staff to work out any transitional difficulties.

The Hospital Command element, ER representatives and the researcher agreed that given the above circumstances, the month of December, although not ideal due to the holiday season, would nonetheless be the best time to collect data for the study.

Pre-data Collection Phase

The pre-data collection phase began in October when the researcher spent two weeks in the ER on the evening shift getting a "feel" for the way the ER operated. Patterns of patient flow were examined, specific patient care services performed by each staff member were identified, and the interdepartmental relationships between the ER and its support services were observed. Additionally, all members of the ER staff were briefed on the mission and objectives of the research project.

During the month of November, the researcher spent another two weeks on the evening shift determining which portions of the ER to model, designing and refining a patient contact data collection checklist (Appendix K) and objectives of the study. This period was intended to accustom the staff to seeing the researcher in the ER. Hopefully, this would reduce any bias as a result of the "Hawthorne effect" -- the change in work or behavior pattern as a result of the presence of an observer.

Data Collection Phase.

In December, the following data was collected:

1. Demographic (age, gender and triage category)

2. Date and weekday treated

3. Specific room/bed in which treated

4. Chief complaint/diagnosis

5. The following times:

    a. Arrival/Log-in/Triage

    b. Vital signs taken

    c. Ancillary (lab, x-ray) tests ordered

    d. Ancillary test results returned

    e. Disposition (admit, transfer, discharge)

    f. Patient service times - the start and completion time of various patient care activities performed by physicians, nurses and paraprofessionals to include: direct patient care (triage, procedures and administering medication) and other hands-on procedures; and the indirect patient care (preparing medication, interpreting and evaluating patient data, and charting or documentation of treatment).

Data on administrative tasks such as developing work schedules, stocking supplies, and telephone consults were not included in this study.

Data Source

Emory defines primary data as coming from the original source and collected especially for the task at hand (Emory, 1985). The researcher collected the

information through direct observation specifically for analysis and use in this project. Emory identifies several advantages and disadvantages for using primary source data. One advantage applicable in this study is that it allows the researcher to observe a process in its entirety. This allows treatment patterns to be detected and data collection methods to become systematized to decrease the potential of missing a significant event. Another advantage is that original data can be collected at the time that it occurs. This limits the need and the error involved in attempting to reconstruct unobtained or unobtainable data. A third advantage is that the ER staff would probably accept an observational type of intrusion better than questioning or other methods.

There are two disadvantages associated with collecting and using observational primary data. The first is the observer must normally be physically at the scene when the event takes place, which can be expensive and time consuming. Another identified disadvantage is that the most reliable results of observational data are restricted to data that can be determined from overt action. Inferences drawn by

different observers may include an element of variability.

Procedures

Two main research tools were used in the BJACH ER: a Time-in-Motion (TIM) study and a computer simulation model. The purpose for developing a TIM study was to gather information about patterns and aberrations associated with the station to station patient flow throughout the ER and the types of tasks performed at each station; physician, nurse, and paraprofessional patient service times for direct and indirect patient care; and turnaround times for lab and x-ray results.

The design of the TIM study was tailored to the physical layout of the BJACH ER. The BJACH ER consists of two main areas (Appendix L). In the triage area, where patients are registered and prioritized, patients have the option of waiting for an available ER bed or choosing (if eligible) to receive care in the Non-Urgent Care Clinic. Patients who elect to be treated in the ER are escorted through a set of double doors to the treatment area and to one of the nine routine exam or monitor and trauma beds.

The researcher was positioned within the treatment area to track patients as they enter from the triage

area. Only one patient was tracked at a time starting with the first patient to enter the treatment area on or after 1500. Once that patient was dispositioned, the next patient to enter the bed area was tracked, and so forth, until the final patient who came to the treatment area prior to 2300 was dispositioned. Tracking patients as they enter the treatment bed area eliminated the need to remove from the study those patients who were referred to the Non-Urgent Care Clinic. It should be noted that since the start and stop time of each patient care activity was being recorded only one watch was needed. This is in contrast to the traditional time studies which record time intervals and need a separate stopwatch for each resource being observed.

Using the SIMAN simulation language, a computer model (Appendix E) of the BJACH ER was constructed to make several predictions. The first was to determine the effects of varying resource inputs, such as physicians, nurses, paraprofessionals and beds, on the average visit time of patients currently being treated in the ER. Another was to identify the optimum staffing level and number of beds required to maintain an average visit time less than 180 minutes at least 95%

of the time. The final was to determine the effects of increasing the number of patients treated in the ER on the mean visit time.

Descriptive statistics (mean, standard deviation, minimum and maximum values) of the sample and simulated populations were calculated by the model. Also analyzed in the results section are the average patient visit times, wait times for various resources and resource utilization rates. Inferential statistics were used to derive conclusions about the ER population.

Validity

The primary objective during the first step of validation was to develop a model with high face validity, that is, one which on the surface seems reasonable to knowledgeable people. This goal was accomplished through interviews with experts (Major Galarza, Dr. Finsteun - instructors at U.S. Army-Baylor University Program in Healthcare Administration); interviews with the Chief of Emergency Services, the Head Nurse of the ER and other members of the ER staff; an extensive literature review to examine existing theories; observations of the system by the researcher; and intuition and experience of the researcher.

The goal of the second step of validation was to quantitatively test any assumptions made during the initial stages of model development. Several assumptions were tested. The first assumption was that the proportion of patients by triage category for the data collection period was representative of the patient population as a whole. A second assumption was that the same probability of occurrence exists for each patient triage type during any one hour period on the evening shift. The third was that the same probability of occurrence exists for each patient type during any weekday of the evening shift. Supporting evidence for all these assumptions was obtained through ad hoc reports generated by the AQCESS system. With a few exceptions such as payday weekend and deployment fluctuations, these three assumptions were also supported by both the Chief of Emergency Services and the Head Nurse of the ER.

Additionally, arrival rates per hour were calculated for each hour of the evening shift on all patients (N=232) that were treated in the ER during the entire data collection period and are listed in Table 6 (Appendix M).

Table 6 - Average Patient Arrival Rate Per Hour								
	1500	1600	1700	1800	1900	2000	2100	2200
Avg/ Hour	3.86	4.57	3.71	4.71	4.71	4.71	3.71	3.14

The final, and probably the most definitive, means of testing the validity of a simulation model is to establish that the model output data closely resemble the output data observed from the actual system. A model of the Bayne-Jones ER was developed using baseline resource inputs. Input data consisted of average times for patient care activities and various probability distributions. Model output data included average patient waiting times and utilization rates of the resources. Model output data were compared to actual ER output data. Since the model and observed output data compared favorably, there is more confidence that the model is valid than if the comparison had not been made.

A number of statistical tests have been suggested in the literature for validating the output data from a simulation model with those from the corresponding real-world systems. However, the comparison is not as simple as it might seem, since the output process of

almost all real world systems and simulations are non-stationary (the distributions of successive observations change over time) and auto-correlated (the observations in the process are correlated with each other). The conditions in the ER are non-stationary (e.g., non-equilibrium or not steady state). Classical statistical tests and analytical techniques (queuing) assume that steady state conditions exist, or that the system is constantly changing. In a steady state environment, as long as the mean and standard deviation are known, the underlying distribution is not important. Fluctuations about the mean are not considered. Moreover, there is no difference in the results obtained from calculating a queuing model multiple times. Simulation modeling accounts for fluctuations about the mean and random variability. Therefore, simulation modeling was used to test the simultaneous effects which result from a change in resource inputs.

Reliability

Reliability is the accuracy or precision of the measuring instrument (or the error of measurement): the more error, the less reliable the instrument; the less error, the more reliable. There are two types of

errors: systemic and random. Systemic error is the variation in measures due to some known or unknown influences that cause the scores to lean in one direction or another. Random error is the fluctuation or varying of measures due to chance. Total error is the sum of system and random error.

In this study, the following precautions were taken to reduce error:

1. The researcher spent two periods of time in the ER prior to the data collection phase to observe the patterns of patient flow, the various types of patient service activities and other idiosyncrasies associated with the BJACH ER.

2. Each day prior to the start of the data collection, the researcher called for a local time report to insure that the watch used by the researcher and the clocks in the ER were all set to the same time. The ER staff was instructed to record the time using only the ER clocks.

3. Recorded patient service times were reviewed with the various providers to ensure the researcher "saw" what the providers "saw."

4. To increase confidence in the portion of the simulation model which identifies the diagnostic test

delays, both a laboratory and radiology "turnaround time" study were conducted. For the period 13 November 1989 through 12 January 1990, 200 laboratory request forms were randomly selected by the Chief of the Department of Pathology from the weekday evening shift. The average turnaround time (45 minutes) was determined by the researcher and compared to the turnaround time (49 minutes) for test results from the data collection period. These results are consistent with the Department of Pathology Turnaround Times for "STATS" matrix provided as an enclosure to the Department of Pathology Quality Assurance Committee Minutes dated 6 September 1989 (Appendix N). STAT is the highest level of priority given to a lab test request with results returning to requestor within 60 minutes. The matrix shows that this standard was met by the lab 98.9% of the time (across all shifts). All requests that originate from the ER are considered to be STAT.

During the same time period a random sample of 200 entries were selected from the Department of Radiology log sheets. The results (31 minutes) compared extremely well to the turnaround time calculated during the data collection period (30 minutes). Subsequent to the study, it was discovered that the radiology times

recorded on the log sheets may be slightly understated. The arrival time is recorded when the sole technician on duty is about to begin a procedure, rather than when the patient first arrives for an x-ray. The time spent waiting for a technician, who may be in the diagnostic area completing a procedure, is not reflected. However, with an average of only 15 patients over the 8 hour period, and with another technician on call, the waiting time appears to be minimal.

5. For each resource change, 75 computer iterations were performed. Each iteration was equivalent to one day (about 30 to 40 patients) of patient data input. Therefore, between 2250 and 3000 simulated patients were treated in the ER to obtain output data on each resource change.

Ethical Considerations

No patients were directly involved in this study. Rather, data from patient medical records was collected and identified with the ER log number rather than using patient names. This process will maintain patient confidentiality and, if necessary, allow the researcher to retrieve additional information on specific patients.

Results

Triage Area

A small portion of the study examined the activities in the triage area of the BJACH ER. Data collected from the Automated SF558 (Emergency Care and Treatment Form) and from ad hoc reports generated by the AQCESS computer is consolidated in Tables 7 and 8. However, most of the study focused on the activities occurring in the treatment area. The treatment area was also the target of the computer simulation model and is analyzed in much more detail below.

Table 7 - Average Wait Time Prior to Being Seen by Physician (Min)

	Dec 89	Mar 90
Emergent	31	48
Urgent	46	50
Non-Urgent	35	47
All Categories	43	49

Table 7 shows the average amount of time by triage category that patients treated in the ER had to spend waiting prior to being seen by a physician. These

values were compiled from several ad hoc reports generated by the AQCESS computer system (Appendix O).

Table 8 - Time Waiting for Physician During Data Collection Phase (min)

	Arrival to Vitals	Vitals to Bed	Bed to Doc	Total
MTBed Pnt	10.60	5.10	10.50	26.20
RegBed Pnt	11.71	15.45	8.29	35.45
All Pnts	11.43	12.92	8.83	32.44

Table 8 shows the components and total amount of time patients waited for a physician during the data collection period: from the time of arrival (Log-In) until their vital signs were taken (Arrival to Vitals); from the time their vital signs were taken until they were assigned to a bed (Vitals to Bed); and from the time they were assigned to a bed until the first encounter with the ER physician.

Treatment Area

Patient Study Sample

The sample population (N=41) was composed of 17 males (41.5%) and 24 females (58.5%). The average age of the sample was 23.62 years with a standard deviation

of 18.87 years. The age frequency distribution revealed that the sample consisted of 14 (34.1%) pediatric (up to 17 years old) and 27 (65.9%) adult (18 to 60 years old) patients. Of the patients treated, 7 (17.7%) were active duty (AD) soldiers, 28 (68.3%) were dependents of AD soldiers and 2 (4.9%) were retired beneficiaries. The BJACH ER triaged their patients into three categories (Appendix D): non-urgent (the least severe requiring the minimum time and resource utilization); urgent (more severe requiring additional time and resource utilization); emergent (most severe requiring the most treatment). The percentage of patients per treatment category was non-urgent (63.4%), urgent (31.6%) and emergent (4.9%).

Simulation Model

Baseline. In the BJACH ER study, information about the patient treatment process, personnel staffing levels, available beds and turnaround times for both lab and x-ray results were collected during the data collection phase. This information was used to identify the simulation model "baseline" or actual staffing of physicians, nurses, paraprofessionals and the number and type of beds (Appendix P) available during the study period.

Resource Changes. Once the average "baseline" of physician, nurse, paraprofessional and bed resources was established, the number and type of resources (Appendix Q) were varied to assess the impacts on patient visit times and resource utilization rates. Data on each resource change was collected for a period of 75 "simulated" days. Some of the resource changes executed in the study are listed below:

1. Patient volume: 33 patients/evening shift

a. Baseline: 2.5 physicians, 1 nurse, 7 paraprofessionals, 4 monitor/trauma beds, 5 regular beds

b. Resource Changes:

(1) Increase by 1 physician (Doc+1)

(2) Increase by 2 physicians (Doc+2)

(3) Increase by 1 nurse (Nurse+1, Nur+1)

(4) Increase by 2 nurses (Nurse+2, Nur+2)

(5) Increase by 1 paraprofessional (Para+1, P/P+1)

(6) Decrease by 1 paraprofessional (Para-1, P/P-1)

(7) Decrease by 2 paraprofessionals

(Para-2, P/P-2)

(8) Decrease by 3 paraprofessionals (Para-3, P/P-3)

(9) Increase by 1 monitor/trauma bed (MTBed+1, MT+1)

(10) Increase by 2 monitor/trauma beds (MTBed+2,MT+2)

(11) Increase by 1 regular bed (RegBed+1, R+1)

(12) Increase by 2 regular beds (RegBed+2, R+2)

(13) Increase by 1 physician and 1 regular bed (Doc+1/RegBed+1)

Note: The total average number of minutes that resulted from these resource changes can be seen in Appendix R, Tables 1 through 5. Tables 9, 10, 12 and 14, below, reflect the difference (in minutes) from the baseline that occurred by executing a resource change. An average of the visit time from all three triage categories is presented in the row called "All Cat."

Table 9 shows the change in patient triage category visit times associated with different

physician (Doc), nurse (Nurse), and Paraprofessional (Para) staffing levels.

Table 9 - Effects of Staffing Changes On Average Visit Time (min)

	Base Time	Doc +1	Doc +2	Nurse +1	Nurse +2	Para +1	Para -1	Para -2	Para -3
Non-Urgent	110	-15	-15	-5	-5	0	-1	-4	-5
Urgent	86	0	-1	+3	+2	0	+3	+3	+4
Emergent	98	0	-5	-2	+15	0	+1	+3	+6
All Cat	103	-10	-10	-3	-5	0	0	-2	-2

Table 10 shows the change in patient triage category visit times by increasing the number of monitor/trauma (MTBed) and regular (RegBed) beds.

Table 10 - Effects of Increasing Beds On Average Waiting Time (min)

	Base Time	MTBed +1	MTBed +2	RegBed +1	RegBed +2
NonUrgent	110	-6	-6	-19	0
Urgent	86	0	+1	0	0
Emergent	98	-6	-2	-3	0
All Cat	103	-5	-4	-12	0

The resource for which patients waited the longest

was isolated. Table 11 reflects that the average time spent waiting for this resource, a regular bed (RegBed), was 32 minutes.

Table 11 - Average Time Spent Waiting For Physician or Bed (min)

	Average	StdDev	MIN	MAX
RegBed	32.0	30.2	.628	149

The associated standard deviation (SD) at the 95% confidence level as well as the average minimum (MIN) and average maximum (MAX) values are also displayed. The first row of Table 12 shows the average wait time for a regular bed associated with each resource change. The second row displays the change from the base time as a result of varying each resource.

Table 12 - Regular Bed Wait Time And Change (min) Across Resources

	Base Time	Doc +1	Doc +2	Nur +1	Nur +2	P/P +1	P/P -1	P/P -2	P/P -3	MT +1	MT +2	R +1	R +2
Avg Wait	32	20	22	32	26	30	31	29	32	25	26	13	32
Change	NA	-12	-10	0	-6	-2	-1	-3	0	-7	-6	-19	0

In this study, the utilization rate (UR) represents the average number of resources that are busy performing patient care (as opposed to administrative, maintenance, etc.) activities at any given time. Table 13 shows the actual number of resources available, baseline utilization rates, and the resource associated with both the minimum and maximum utilization rates for the physicians, nurses, and paraprofessionals.

Table 13 - Patient Care Utilization Rates

	Act	Base UR	Min	Max
Doctor	2.5	1.57	1.51 (+2MTBed)	1.61 (+2Nurse)
Nurse	1	.372	.365 (+2MTBed)	.392 (+1RegBed)
Para	7	1.73	1.67 (+1MTBed)	1.80 (+1RegBed)
MTBed	4	1.12	1.03 (+1Doc)	1.31 (+2Nurse)
RegBed	5	4.33	4.16 (+2MTBed)	4.48 (+1RegBed)

Table 14 compares the average visit time for each triage category (baseline) with the change in minutes associated with an increase of one physician (Doc+1), one regular bed (RegBed+1) and one physician plus one regular bed (Doc+1/RegBed+1).

Table 14 - Effects of Physician and Bed Increases on Average Visit Time

	Base Line	Doc +1	RegBed +1	Doc+1/ RegBed+1
NonUrgent	110	-15	-1y	-18
Urgent	86	0	0	0
Emergent	98	0	-3	-4
All Ctgs	103	-10	-12	-12

Table 15 shows the effects on the baseline average and maximum visit time of adding one regular bed to existing resources.

Table 15 - Effects of Adding a Regular Bed on Average and Maximum Visit Time (VT)

	Average VT	95% CI	Max
Baseline	103	96.7 - 109	204
+1RegBed	91	87.1 - 94.9	163

Increase in ER Workload. The simulation model was reprogrammed to reflect a 20% and 30% increase in the number of patients treated in the BJACH ER during the weekday evening shift. Table 16 shows the effects of these increases on the average visit time by category

and the amount of time spent waiting for a regular bed.

Table 16 - Increased Workload Average Visit Time (min)

	Base Time	AVT +20%	Change (min)	AVT +30%	Change (min)
NonUrgent	110	153	+43	185	+75
Urgent	86	95	+9	97	+11
Emergent	98	114	+16	110	+12
All Ctgs	103	130	+27	147	+44
Wait for RegBed	32	70	+42	92	+60

Discussion

The introduction noted that some patients complained their visit times were too long and also that the Commander believed that patients spent too much time waiting for their first encounter with a physician. AQCESS ad-hoc reports were generated to address these issues and the results are presented in Table 7. Table 7 shows that of all the patients treated in the ER during the months of December 1989 and March 1990 the average time that a patient waited prior to being seen by a physician was 43 and 49 minutes respectively. As Colonel Cecere suspected, this was a significant portion (42%) of the ER visit for the month of December. However, once a patient got to a bed in the BJACH ER, little additional time was spent waiting. This compares favorably to DiGiacamo's study of an urban, community-sized ER which found that a patient spent 41% of the time in the system waiting and 59% being treated.

As shown in Table 8, the time that patients requiring a monitor/trauma bed (MTBed Patient) spent waiting for a physician was an average of 26.2 minutes. This included a 10.6 minute wait for arrival time until vital signs were taken; 5.1 minutes until they arrived

at a monitor/trauma bed; and 10.5 minutes until their first encounter with a physician. However, these figures may be misleading. For example, patients transported to the hospital by ambulance, have their vital signs taken enroute. A period of time would elapse before a second set of vital signs was medically warranted, but, for purposes of the simulation model, data collection began at the moment the patient presented to the ER. Therefore it would appear to the model that the initial vital signs were taken after the patient arrived at the ER. Table 8 reflects that it took an average of 10.5 minutes until MTBed patients had their first encounter with a physician. However, protocols exist which allow the triage nurse to request diagnostic tests and conduct certain procedures (e.g., hooking up an EKG monitor, starting an IV) prior to examination by the physician. While the numbers may suggest that patients simply waited for a physician to begin an examination, in actuality a flurry of patient activity may be taking place. In contrast, a patient requiring a regular bed (RegBed Patient) spent an average of 36.45 minutes waiting for a physician. This included 11.71 minutes until vital signs were completed, 15.45 minutes until arriving at a regular

bed in the treatment room, and 8.29 minutes until a physician arrived to treat them. The shorter time that it took for a physician to arrive at a regular bed (8-29 minutes) when compared to a MTBed (10.5 minutes) may also need a further comment. The majority of patients seen in the ER are non-urgent. On average, they spend more time waiting for their vital signs to be taken and to arrive at a regular bed, but once in the treatment area they are quickly dispositioned by the ER physician. The average wait time for all patients during the data collection period was 32.44 minutes and compared favorably to the wait time during December 1989 (43 minutes) and March 1990 (49 minutes).

As seen in Table 9, the addition of one or elimination of as many as three paraprofessionals has little effect on the overall average visit time of all categories (All Cat) of patients. Although the visit times increased slightly for urgent and nonurgent patients with one, two or three fewer paraprofessionals, the nonurgent patients' times decreased enough to result in a slight net decrease in the average visit time. The utilization rate for the seven paraprofessionals was only 1.73 and only increased marginally to 1.75 with three fewer

paraprofessionals. This means that even at the lower staffing level, on average only 1.75 of these resources are kept busy. Recall, however, that this utilization rate refers only to patient care activities which take place in the treatment area. Paraprofessionals perform a number of activities not included in this study (supply restocking, maintenance, ambulance runs, patient transfers, etc). Additionally, one paraprofessional is assigned to the triage area for the entire shift to take vital signs.

Table 9 also indicates a relatively small effect on the average visit time by adding one or two nurses, a decrease of three and five minutes, respectively. Although the nurse utilization rate (a baseline of .372) was comparatively much higher than that of the paraprofessionals, the rate did not change appreciably with the addition of one nurse and only minimally with the addition of two nurses (to .380). Nurses, like paraprofessionals, perform a number of non-patient related tasks not included in this study (telephone consultations, staff work schedules, drug inventories, etc).

The largest decrease (10 minutes) in average visit time attributable to changes in staffing levels was

seen with the addition of one physician; adding a second physician demonstrated no further decrease. However, the physician utilization rate decreased only marginally with the addition of one physician and adding two physicians prompted no further decrease. This indicated that adding one physician only slightly increased the number of these resources that are busy, but it does shorten the patients' average visit times by 10 minutes.

Table 10 depicts that the largest decrease (12 minutes) across all resources and all patient categories occurred with the addition of one regular bed. Adding a second regular bed had no impact on visit times whatsoever and adding either one or two monitor/trauma beds reduced the visit time to 5 or 4 minutes, respectively.

On average, the amount of time that patients spent waiting for a regular bed was 32 minutes (Table 11). However, by adding one standard deviation (30.2 minutes) to the mean, it could take up to 62.2 minutes for 95% of the patients requiring a regular bed to get one. Moreover, it could take as much as 149 minutes for up to 2.5% of these patients to get to a regular bed.

Table 12 shows that the largest reduction (12 minutes) in the time spent waiting for a regular bed as a result of staffing changes occurred when one physician was added to the staff. Adding two physicians, one or two nurses, or decreasing the staff by as many as three paraprofessionals had less of an impact. Similarly, adding either one or two monitor/trauma beds had only a moderate impact. The largest reduction in waiting for a regular bed occurred when adding one regular bed was added.

Table 13 examines the patient care utilization rates for all resources. The column labeled "Act" reflects the number of resources available during the data collection period. These values were also used as the computer model baseline level. The next column, "Base UR", identifies the utilization rate of the baseline resources. It is important to note that, of the five regular beds available in the ER, 4.33 of them were consistently being used. The next two columns ("Min" and "Max") identify the specific resource change that gives that resource its lowest or highest utilization rates. By increasing the number of regular beds (+1RegBed in Max column), the nurse, paraprofessional and regular bed utilization rates also

increase. However, not only would more of the nurse and paraprofessional resources be committed at any given time, but increasing the number of regular beds also increases the average utilization of all the regular beds.

So far, the two largest reductions in the average patient visit time were seen by increasing the staff by one physician (-10 minutes) and adding a regular bed (-12 minutes). The effects of executing both resource changes simultaneously are seen in Table 14. Adding a physician and a regular bed did not decrease the average patient visit time more than the addition of one regular bed alone. However, the utilization rates of all 5 resources did decrease very slightly (Table R-4).

Table 15 demonstrates that for the baseline level of resources, the average visit time across all categories was 103 minutes with a 95% confidence interval (CI) of 96.7 to 109 minutes and a maximum value of 204 minutes. This means that after running between 2500 and 3000 patients through the simulation model the average visit time was 103 minutes with 95% of the visit times between 96.7 and 109 minutes, up to 2.5% (due to a 2 tailed t-test) might have been as high

as 204 minutes. After adding one regular bed, the average time across all categories dropped to 91 minutes with 95% of the visit times between 87.1 and 94.9, and 2.5% of the visit times reaching up to a maximum of 163 minutes.

The average visit times associated with a 20% and 30% increase in the number of patients treated in the BJACH ER is reflected in Table 16. The respective increase for emergent (9 and 11 minutes) and urgent (16 and 12 minutes) patients were moderate. However, non-urgent patient visit times rose considerably: 43 minutes with a 20% increase and 75 minutes for a 30% increase. The effects of this population increase for all triage categories is also apparent: 27 minutes for a 20% rise and 44 minutes for a 30% rise in the number of patients being treated. Moreover, the wait for a regular bed nearly triples from 32 to 92 minutes with a 30% increase in patient census.

Conclusion

According to the MEDDAC Commander and his staff, the current ER patient visit times were unacceptable. A computer simulation model was developed to predict the results of changing the resources within the ER without altering the system. The resource change or combination of resource changes tested that proved to be the most efficient in terms of lowering the average visit time of all categories of patients was the addition of one regular bed. This lowered the visit time from 103 to 91 minutes; a drop of 12 minutes (11.4%).

Adding a regular bed also reduced the amount of time that patients who needed a regular bed had to wait, from 32 to 13 minutes; a drop of 19 minutes (59.4%).

Additionally, adding a regular bed reduced the maximum visit time value from 204 to 163 minutes with a 95% confidence interval. This was acceptable to the Commander whose goal remains to have 95% of the arrival to disposition (visit) times of patients treated in the ER to be less than 180 minutes.

Finally, adding one regular bed significantly reduced both the current average visit time and the amount of time patients wait for a regular bed and may

similarly reduce the amount of time patients spend in the ER when the demand and subsequent utilization increases.

Recommendations

Currently, there are six areas in the treatment area not being used as a patient bed area (Appendix S). These include: the office of the Chief of EMS, Ambulance Dispatch Room, a soiled linen room, a supply room, the office of the Head Nurse and NCOIC, and an area where medications are kept.

I recommend a reorganization of these six areas so that an additional bed area can be included in the treatment area of the ER.

I also recommend that this model be expanded to assess the impacts of the Ambulance Section and Outpatient Clinics on the amount of time patients spend in the ER.

Additionally, the information derived from this study could be applied by other military treatment facilities similar to Bayne-Jones and civilian health care institutions. The information received from the "what if" capability (altering inputs to produce simulated outputs) of simulation modeling can be used in strategic planning and policy decision making.

References

_____ Accreditation Manual for Hospitals (1989). Chicago: Joint Commission on the Accreditation of Hospitals.

Ahituv, N. & Berman, D. (1987). Devising a cooperation policy for emergency networks. The Journal of the Operations Research Society, 38(1), 1015-29.

Albin, S., Wassertheil-Smoller, S., Jacobson, S., & Bell, B. (1975). Evaluation of emergency room triage performed by nurses. American Journal of Public Health, 1989 Edition. (1989). Chicago: American Hospital Association.

American College of Emergency Physicians. (1987). Access to emergency medical care: emergency physicians and uncompensated care. Annals of Emergency Medicine, 16(11), 1302-4.

Baligh, H.H. & Laughhunn, D.J. (1960). An economic and linear model of the hospital. Health Services Research, 4(4), 293-303.

Barton, D.A. (1990). In defense of uniformed health care in the 1990s: A walk through the labyrinth. (Unpublished)

Becker, J.M., Dombkowski, J.C., Laramie, C.S., & Doyle, T.C. (1986). Economic Analysis of Fort Bragg USA

Hospital, Volume II: Requirements Analysis. Vector Research, Inc. and Adams, Inc.

Berman, D.A. (1989). Computerized algorithm directed triage in the emergency department. Annals of Emergency Medicine, 18(2), 141-4.

Bertram, D.A. (1983). Managing an emergency department: the effect of patient flow on physician performance. QRB

Bianchi, G. & Church, R.L. (1988). A hybrid FLEET model for emergency medical service system design. Social Science and Medicine, 26(1), 163-71.

Blanchet, K.D. & Switlik, M.M. (1985). The Handbook of Hospital Admitting Management. Rockville, MD: Aspen Systems Corporation.

Bloom, B.S. & Fendrick, A.M. (1987). Waiting for care. Queuing and resource allocation. Medical Care, 25(2), 131-9.

Brandeau, M.L. & Hopkins, D.S. (1984). A patient mix model for hospital financed planning. Inquiry, 21, 32-44.

Brown, T.L. & Dyer, D.R. (1975). A simulation of the emergency clinic and department of primary care at the Wright-Patterson AFB Medical Center. NTIS, (January), 191 pp.

Buschiazzo, L. (1985). Marketing the emergency department. Nursing Management, 16(9), 30B-30D.

Butler, W.R. (1986). ED patient classification matrix: development and testing of one tool. Journal of Emergency Nursing, 12(5), 279-85.

_____ Buyer's guide 1988. (1988) Emergency, 20(4), 83-112.

Cannon, G.A. (1988). Spreading the wealth. A theoretical rotation to relieve burnout. Journal of Emergency Medical Services, 13(3), 37-9.

Cantrill, S.V. (1987) Use of computers in emergency department practice. Emergency Medical Clinics of North America, 5(1), 155-65.

Carroll, C. (1988). Reimbursement realities and the triage nurse's role. JEN, 14(4), 217-24

Champion, S.R. & Sacco, W.J. (1982). Measurement of patient illness severity. Critical Care Medicine, 10(8), 552-3.

Coburn, M.S. (1988). One hospital's experience with guidelines for improved collaboration between emergency medical technicians, nurses, and physicians. JEN, 14(1), 19-22.

Congressional Budget Office. (1988). Reforming the Military Health Care System. Washington, D.C.: U.S. Government Printing Office.

Costello, K.J. (1987). Evaluating consumer perceptions of emergency medical services: an exploratory study. Journal of Ambulatory Care Marketing, 1(2), 9-21.

Craft, J.L. (1987). Remote TV sensing: technology of the future? Emergency Medical Services, 16(5), 11, 102, 104.

Craren, E.J. (1986). Public knowledge of EMS. Evaluating the information/public education component. Journal of Emergency Medical Services, 11(11), 36-8.

Crippen, D. (1985). Cost effectiveness and emergency medicine: what price triage? Journal of Family Practice, 21(5), 403-5.

Crippen, D.W. (1986). Emergency care or convenience care. Providers may have to choose one hat. Postgraduate Medicine, 80(5), 107-9.

Csepnyi, A. (1980). The Hungarian model of an emergency admission and care department. Annals of Emergency Medicine, 9(7), 364-7.

Cue, F. & Inglis, R. (1978). Improving the operations of the emergency department. Hospitals, 42(13), 110-119.

Culmer, B.B. (1975). A simulation model for multi-channel, time-dependent queuing systems and an application to test and evaluate an analytical model of the U.S. Army Acute Minor Illness Clinics. NTIS, September, 94 pp.

Dickhudt, J.S. (1987). Emergency room use and abuse. How it varies with payment mechanism. Minnesota Medicine, 70(10), 571-4.

Dickenson, G. (1988). Emergency department design and patient flow. Annals of Emergency Medicine, 17(6), 664.

DiGiacamo, E.V. & Kramer, L.D. (1982). A study of emergency unit waiting times. QRB, 10-13.

DiMeglio, P., Knapp, M., & Swiderksi, F. (1989). Efficient use of emergency room resources: at Humana of San Antonio Hospital. (unpublished paper).

Don, B., Lee, A., Goldacre, M.J. (1987). Waiting list statistics. Comparison of two measures of waiting times. British Medical Journal, 295(6608), 1247-8.

Durston, W. (1987). Impact of HMOs on emergency medical services: another perspective. Annals of Emergency Medicine, 16(6), 683-5.

_____ EMS computer software cavalcade. (1988). Emergency Medical Services, 17(6), 25-30, 41.

_____ ER results that soar. Profiles in Healthcare Marketing, 2(30), 66-7.

Fletcher, J.R., Bond, J.C., Delfosse, C., and Richards, P.B. (1979). Computer model for simulation of emergency medical systems. Military Medicine, 144(4), 231-5.

Frew, S.A. (1988). COBRA: implications for emergency medicine. Annals of Emergency Medicine, 17(8), 835-7.

Fries, B.E., Gutkin, C.E., & Ginsberg, A.S. (1977). Emergency room utilization: Data reconstruction using a deterministic simulation model. Computers and Biomedical Research, 10, 153-63.

Genell-Andren,K. (1987). Heavy users of an emergency department - a two year follow-up study. Social Science Medicine, 25(7), 825-31.

Greist, J., Van Cura, L., & Kneppreth, N. (1973). A computer interview for the emergency room patient. Computers and Biomedical Research, 6, 257-65.

Griffith, H. (1988). Capital commentary: Health care statistics released by HHS. Nursing Economics, 63, 136.

Guterman, J.J., Franaszek, J.B., & Gifford, M. (1985). The 1980 patient urgency study: further analysis of the data. Annals of Emergency Medicine, 14(12), 1191-98.

Haddy, R.I., Schmaler, M.E., & Epting, R.J. (1987). Nonemergency emergency room use in patients with and without primary care physicians. Journal of Family Practice, 24(4), 389-92.

Hallett, A.M. (1988). High-tech help. Emergency, 28-30.

Hansagi, H. (1987). Trial of a method of reducing inappropriate demands on a hospital emergency department. Public Health, 101(2), 99-105.

Headrick, R.W. & Morgan, G.W. (1988). Resource allocation in multifacility emergency medical service systems. Journal of Emergency Medical Systems, 12(3), 121-8.

Heath, W. (1986). Computer systems. Saving money -- saving lives. Health Services Journal, 96(5024), 1458.

Heckerling, P.S. (1984). Time study of an emergency room: identification of sources of patient delay. Illinois Medicine. 166, 437-40.

Henneman, P.L., Hockberger, R.S., & Chiu, C.Y. (1989). Attending coverage in academic emergency medicine: a national survey. Annals of Emergency Medicine, 18(1), 34-41.

Hoffman, F. & Wakefield, D.S. (1986) Ambulatory care patient classification. Journal of Nursing Administration, 16(4), 23-30.

_____ Hospital Fact Book. (1987). Sacramento: CAHHS.

Hunt, H.D. (1980). Simulation modeling of emergency medical services (EMS) telecommunications systems. NTIS, January, 162 pp.

Jacobs, M. P. (1987). The Economics of Health and Medical Care. Rockville, MD: Aspen Publishers, Inc.

Jensen, P.A. (1986). Student's Guide to Operations Research. McGraw-Hill Book Company.

Johnson, D.V. (1987). An administrative perspective on emergency medicine. Emergency Medical Clinics of North America, 5(1), 149-53.

Jones, A.W., Sahney, V.K., and Kurtoglu, A. A discrete event simulation for the management of

surgical suite scheduling. From Annual Simulation Symposium.

Jones, S.L., Jones, P.K., & Katz, J. (1988) Health belief model intervention to increase compliance with emergency department patients. Medical Care, 26(12), 1172-84.

Jones, S.L., Jones, P.K., & Katz, J. (1988). Improving compliance with referrals from the emergency department. Journal of Emergency Nursing, 14(1), 27-9.

Kampke, T. (1989). Optimal scheduling of jobs with exponential service times on identical parallel processors. Journal of the Operations Research Society, 31(1), 126-33.

Keilson, J. & Servi, L.D. (1987). Dynamics of the M/G/1 vacation model. Journal of the Operations Research Society, 35(4), 575-82.

Keller-Unger, J.L. (1987). Problem solving in the ED. Nursing Management, 18(3), 72I-72P.

Kiely, T. (1988). Fastest care in the West. Technological Review, 91(3), 8, 10.

Klafehn, K.A., Rakich, J.S., & Kuzdrall, P.J. (1989). The use of simulation as an aid in hospital

management decision making. Hospital Topics, 67(2), 6-12.

Kvalseth, T.O. & Deems, J.M. (1979). Statistical models of the demand for emergency medical services in an urban area. American Journal of Public Health, 69(3), 250-5.

Levin, R.I., Rubin, D.S., & Stinson, J.P. (1986). Quantitative Approaches to Management, 6th Ed. New York: McGraw-Hill Book Company.

Liptak, G.S., Super, D.M., Baker, N., & Roghmann, K.J. (1985). An analysis of waiting times in a pediatric emergency department. Clinical Pediatrics, 24(4), 202-9.

Lohr, W. (1983). Advances in mathematical models: benefits for EMS. Emergency Health Services Review, 2(2), 111-4.

Lyman, J.L. & McCabe, J.B. (1987). Emergency department care: cost awareness by health care providers. Journal of Emergency Medicine, 5(6), 567-71.

Marks, F.E. (1987). Refining a classification system for fiscal and staffing management. Journal of Nursing Administration, 17(1), 39-43.

McKay, J.I. (1985). Historical review of emergency medical services, EMT roles and EMT utilization in emergency departments. Journal of Emergency Nursing, 11(1), 27-32.

Modderman, M.E. (1989). Untitled lecture. Annual Meeting of Deputy Commanders for Administration and U.S. Army-Baylor University Program in Healthcare Administration Symposium San Antonio, Texas, November 1989.

Nelson, R.J. (1978). Emergency health service planning: a methodology for priority setting. Case Studies in Health Administration, 1, 216-8.

Nelson, S. (1987). Emergency care: the changes are just beginning. Hospitals, 61(13), 58.

Nightingale, S.D. (1988). Risk preferences and admitting rates of emergency room physicians. Medical Care, 26(1), 84-7.

Overton, D.T. (1987). A computer-assisted emergency department audit. Annals of Emergency Medicine, 16(1), 68-72.

Parboosingh, E.J. & Larsen, D.E. (1987). Factors influencing frequency and appropriateness of utilization of the emergency room by the elderly. Medical Care, 25(12), 1139-47.

Post, C. (1986). EMS software reviews. Part 1: Data management. Emergency Medical Services, 15(7), 20-1.

Powills, S. (1986). Emergency department wait too long: consumers. Hospitals, 60(19), 122.

Quick, J. & Quick, J. (1984). Organizational Stress and Preventative Management. New York: McGraw Hill.

Ratzan, R.M. (1987). Defining a rational back-up policy for emergency departments. Journal of Emergency Medicine, 5(1), 49-52.

Regenstrief Institute. (1977). A simulation model of the primary health care system of Indiana. From: Winter Simulation Conference, 5-7 December, 1977.

Revelle, C., Bigman, D., Schilling, D., Cohen, J., & Church, R. (1977). Facility location: a review of context-free and EMs models. Health Services Research, 12(2), 129-46.

Riffer, J. (1986). ED visits rise as hospitals learn how to compete. Hospitals, 60(21), 82.

Riner, R.M., Collins, K.M., Foulke, G.E., Moorhead, G.V., & Terry, P. (1987). Categorization of hospital emergency services - developing valid criteria. Western Journal of Medicine, 147(5), 602-8.

Robinson, D.L. (1987). Divided emergency department improves patient satisfaction. Journal of Emergency Nursing, 13(4), 202-3.

Rylko-Bauer, B. (1988). The development and use of freestanding emergency centers: a review of the literature. Medical Care Review, 45(1), 129-63.

Sackmary, B. (1987). Consumer decision processes in emergency medical situations. Journal of Ambulatory Care Marketing, 1(1), 17-30.

Salander, J., Averbush, M., & Wilson, M. (1983). Reorganization of emergency room triage at Womack Army Hospital. Military Medicine, 148, 216-9.

Saunders, C.E. (1989). Modeling emergency department operations using advanced computer simulation systems. Annals of Emergency Medicine, 18(2), 134-40.

Saunders, C.E. (1987). Time study of patient movement through the emergency department: sources of delay in relation to patient acuity. Annals of Emergency Medicine, 16(11), 1244-8.

Schulmerich, S.C. (1986). Converting patient classification data into staffing requirements for the emergency department. Journal of Emergency Nursing, 12(5), 286-90.

Schwartz, L.R. & Overton, D.T. (1987). Emergency department complaints: a one year analysis. Annals of Emergency Medicine, 16(8), 857-61.

Selvig, M. (1985). Triage in the emergency department. Nursing Management, 16, 30B-30H.

Shesser, R., Smith, M., Adams, S., Walls, R., & Paxton, M. (1986) The effectiveness of an organized emergency department follow-up system. Annals of Emergency Medicine, 15(8), 911-5.

Sklar, D.P. (1989). Emergency department technicians in a university county hospital: a 15 year experience. Annals of Emergency Medicine, 18(4).

Slack, W.V., Reed, C.E. & Hicks, G.P. (1986). A computer-based medical history system. New England Journal of Medicine, 274(4), 194-8.

Smeltzer, C.H. & Curtis, L. (1987). An analysis of emergency department time: laying the groundwork for efficiency standards. QRB, 13(7), 240-2.

Smeltzer, C.H. (1986). Analyzing patient time in the emergency department. QRB, 12(11), 380-2.

Smeltzer, C.H. & Curtis, L. (1987). Emergency department care: many perceptions. Nursing Management, 18(11), 96A-96H.

Snell, F.I., Jones, S.L., Yoder, L. (1987). Factors in choosing an urgent care center versus an emergency department. Journal of Emergency Nursing, 13(6), 355-8.

Spaite, D.W., Criss, E.A., Valenzuela, T.D., Meislin, H.W., Smith, R., & Nelson, A. (1988). A new model for providing prehospital medical care in large stadiums. Annals of Emergency Medicine, 17(8), 825-8.

Strauch, G.O. (1979). Categorization of hospital emergency service capabilities: the Connecticut model. Connecticut Medicine, 43(1), 1-7.

Sytkowski, P.A., D'Agnostino, R.N., Belanger, A.J., Bettencourt, K.S., and Stokes, J. (1984). Testing a model that evaluates options for rural emergency medical service development. Medical Care, 22(3), 202-15.

Thorpe, D.P. (1972). A "time study" approach to the evaluation of emergency room activities. Journal of the Maine Medical Association, 63, 197-9.

Updaw, D.P. (1972). Free-standing emergency centers and ambulatory surgery centers: evaluating feasibility and assessing impact on hospital operations. Topics in Health Care Financing, 13(3), 60-7.

Vassilacopoulos, G. (1985). Allocating doctors to shifts in an accident and emergency department. Journal of the Operations Research Socity, 36(6), 517-23.

Vayer, J.S., Ten Eyck, R.P. & Cowan, M.L. (1986). New concepts in triage. Annals of Emergency Medicine, 15(8), 927-30.

_____ Verification of Eligibility for Medical Care and DEERS Checks.

Waitzkin, H. (1983). The Second Sickness: Contradictions of Capitalist Health Care. New York: The Free Press.

Waters, M.C. (1987). Emergency care teamwork. Texas Hospitals, 43(7), 12-4.

Weissberg, M.P., Heitner, M., Lowenstein, S.R., & Keefer, G. (1986). Patients who leave without being seen. Annals of Emergency Medicine, 15(7), 813-7.

Weissberg, R.W. (1977). Using interactive graphics simulating the hospital emergency department, in Willemain, T.R. & Larsen, R.C. (eds). Emergency Medical Systems Analysis. Lexington, MA: Lexington Books.

Wigton, R.W. (1988) Use of linear models to analyze physician's decisions. Medical Decision Making, 8(4), 241-52.

Wilbert, C.C. (1984). Timeliness of care in the emergency department. Quality Review Bulletin, 10(4), 99-108.

Wilson, G.A., McDonald, C.J., & McGabe, G.P. (1982). The effect of immediate access to a computerized medical record on physician test ordering: a controlled clinical trial in the emergency room. American Journal of Public Health, 72(7), 698-702.

Yale University Health Systems Management Group. (1983). Development of an Ambulatory Patient Classification System: Grant Application to Health Care Financing Administration. New Haven: Yale Press.

TABLE 1

BAYNE-JONES ACH

PERSONAL DATA - PRIVACY ACT OF 1974

RUN DATE: 03 MAY 1990 TIME: 1451
PAGE: 1

EMERGENCY ROOM - PERIOD 01 MAY 1989 - 31 MAY 1989
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E	: 1
PATIENT CATEGORY	: 117
PATIENTS W/TIME ARR>DISP OF >180	: 118
PATIENT CATEGORY N	: 10
PATIENT CATEGORY U ---	: 6
PATIENT CATEGORY	: 1111
PATIENTS W/TIME ARR>DISP OF <180	: 1127

(Above) All Dispositions = Total Patients Presented (Table)

TABLE 1

BAYNE-JONES ACH

RUN DATE: 03 MAY 1990 TIME: 1313
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 JUN 1989 - 30 JUN 1989
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP (- MINUTES)

PATIENT CATEGORY : 222

PATIENTS W/TIME ARR>DISP OF >180 : 222

PATIENT CATEGORY E : 1

PATIENT CATEGORY : 1006

PATIENTS W/TIME ARR>DISP OF <180 : 1007

TABLE 1

BAYNE-JONES ACH

RUN DATE: 03 MAY 1990 TIME: 1104
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 JUL 1989 - 31 JUL 1989
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP (- MINUTES)

PATIENT CATEGORY : 101

PATIENTS W/TIME ARR>DISP OF >180 : 101

PATIENT CATEGORY : 1082

PATIENTS W/TIME ARR>DISP OF <180 : 1082

TABLE 1

BAYNE-JONES ACH

PERSONAL DATA - PRIVACY ACT OF 1974

RUN DATE: 02 MAY 1990 TIME: 1556
PAGE: 1

EMERGENCY ROOM - PERIOD 01 AUG 1989 - 31 AUG 1989
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E	: 3
PATIENT CATEGORY N	: 90
PATIENT CATEGORY U	: 25
PATIENT CATEGORY	: 72
PATIENTS W/TIME ARR>DISP OF >180	: 190
PATIENT CATEGORY E	: 32
PATIENT CATEGORY N	: 414
PATIENT CATEGORY U	: 110
PATIENT CATEGORY	: 441
PATIENTS W/TIME ARR>DISP OF <180	: 997

TABLE 1

BAYNE-JONES ACH

RUN DATE: 02 MAY 1990 TIME: 1200
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 SEP 1989 - 30 SEP 1989
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E	: 3
PATIENT CATEGORY N	: 30
PATIENT CATEGORY U	: 11
PATIENT CATEGORY	: 105
PATIENTS W/TIME ARR>DISP OF >180	: 149
PATIENT CATEGORY E	: 8
PATIENT CATEGORY N	: 265
PATIENT CATEGORY U	: 79
PATIENT CATEGORY	: 688
PATIENTS W/TIME ARR>DISP OF <180	: 1040

BAYNE-JONES ACH

RUN DATE: 03 MAY 1990 TIME: 1336
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 MAY 1989 - 31 MAY 1989
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E : 1

PATIENT CATEGORY : 98

PATIENTS W/TIME ARR>DISP OF >180 : 99

PATIENT CATEGORY N : 10

PATIENT CATEGORY U : 5

PATIENT CATEGORY : 948

PATIENTS W/TIME ARR>DISP OF <180 : 963

(Above) 'Home' or 'Duty' = Total Patients Treated (Table)

BAYNE-JONES ACH

RUN DATE: 03 MAY 1990 TIME: 1155
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 JUN 1989 - 30 JUN 1989
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY : 188

PATIENTS W/TIME ARR>DISP OF >180 : 188

PATIENT CATEGORY E : 1

PATIENT CATEGORY : 875

PATIENTS W/TIME ARR>DISP OF <180 : 876

EMERGENCY ROOM - PERIOD 01 JUL 1989 - 31 JUL 1989
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY : 89

PATIENTS W/TIME ARR>DISP OF >180 : 89

PATIENT CATEGORY : 940

PATIENTS W/TIME ARR>DISP OF <180 : 940

BAYNE-JONES ACH

RUN DATE: 02 MAY 1990 TIME: 1243
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 AUG 1989 - 31 AUG 1989
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY N : 78

PATIENT CATEGORY U : 17

PATIENT CATEGORY : 53

PATIENTS W/TIME ARR>DISP OF >180 : 150

PATIENT CATEGORY E : 25

PATIENT CATEGORY N : 381

PATIENT CATEGORY U : 97

PATIENT CATEGORY : 392

PATIENTS W/TIME ARR>DISP OF <180 : 895

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 SEP 1989 - 30 SEP 1989
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E	: 1
PATIENT CATEGORY N	: 29
PATIENT CATEGORY U	: 6
PATIENT CATEGORY	: 87
PATIENTS W/TIME ARR>DISP OF >180	: 123
PATIENT CATEGORY E	: 2
PATIENT CATEGORY N	: 245
PATIENT CATEGORY U	: 72
PATIENT CATEGORY	: 593
PATIENTS W/TIME ARR>DISP OF <180	: 912

SEP 1 2 1989

MEMORANDUM OF UNDERSTANDING
BETWEEN THE BAYNE JONES ARMY COMMUNITY HOSPITAL
AND STERLING EMERGENCY MEDICINE, INC.
CITY OF Fort Polk STATE OF Louisiana

A. GENERAL

1. This agreement is entered into by and between Bayne Jones Army Community Hospital, hereinafter referred to as the hospital, and Sterling Emergency Medicine, Inc., hereinafter referred to as the participating health care entity. The term "participating health care entity" includes the individual practitioners identified on the attached list.

2. The purpose of this agreement is to integrate specific U.S. Army hospital and Office of the Civilian Health and Medical Programs of the Uniformed Services (OCHAMPUS) program resources to provide General Medical services for Civilian Health and Medical Programs of the Uniformed Services (CHAMPUS) beneficiaries in Bayne Jones Army Community Hospital.

3. Individual practitioners identified on the attached list by the participating health care entity are licensed to practice medicine in the State of Louisiana and have completed application for clinical privileges at the hospital for the purpose of practicing medicine in Louisiana. The participating health care entity agrees to all the terms and conditions of the application for clinical privileges at the hospital as well as the terms and conditions of this Memorandum of Understanding.

4. The hospital is a U.S. Government health care facility within the Department of Defense operated by the U.S. Department of the Army. The hospital is accountable to the Surgeon General of the Department of the Army as the equivalent of the Board of Trustees. The commander of the hospital is the local representative of the Board of Trustees and is responsible for the operation of the hospital.

5. It is expressly agreed and understood that the professional services rendered by the participating health care provider are rendered in its capacity an an independent practioner. While this Memorandum of Understanding contains provisions to allow the government to evaluate the quality of medical care provided, to credential the participating health care provider, and for certain other administrative requirements, the government retains no control or supervision over the professional aspects of the services rendered by the participating health care provider, including by example its professional medical judgments, diagnoses, or specific medical treatments. The participating health care provider shall be solely liable for any liability producing act or omission by it or its employees or agents and shall idemnify the government against all liability or loss arising from any liability producing act or omissions by it, its employees, or its agents. The participating health care provider shall maintain professional liability insurance which coverage shall apply to the participating health care providers service rendered under this Agreement at Bayne Jones Army Community Hospital. A certificate of insurance evidencing the required coverage shall be provided prior to the commencement of services under this Agreement.

SEP 1 2 1989

B. ARTICLES OF AGREEMENT

1. The hospital commander, or designee, shall:

a. Review past and current performance of, determine qualifications of (including review of liability insurance coverage), and select potential participating health care entities.

b. Comply with Utilization Review and Quality Assurance Directives and regulations of the Department of the Army, including but not limited to:

(1) Ensuring that individual practitioners of participating health care entities are credentialed in accordance with DoD and Military regulations and the hospital bylaws.

(2) Ensuring that individual practitioners of participating health care entities adhere to the Department of the Army hospital bylaws and DoD and Military regulations to the same extent and in the same manner as Department of the Army health care providers.

c. Provide facilities, ancillary support, diagnostic and therapeutic services, and equipment and supplies necessary for the proper care and management of patients under this agreement to the extent available and authorized for that facility.

d. Provide administrative support to participating health care entities and individual practitioners to the extent available and authorized for that facility, including:

(1) Maintenance of patient records, including transcription and copying services as may be necessary to satisfy both Department of the Army and private practitioner recordkeeping requirements.

(2) Maintenance of individual practitioner case, workload, and credentials files in support of credentialing processes.

(3) CHAMPUS administration requirements, including certification and submission but only to the extent that it is not prohibited by 18 U.S.C. 203, 205.

(4) Reasonable accommodations within the hospital for such periods of time as a participating health care practitioner may be on after-hours call.

(5) Authorizing subsistence at hospital dining facilities at the rates prescribed for civilian guests.

e. Educate Department of the Army hospital staff personnel, beneficiaries, participating health care entities, and other interested civilian providers about the Partnership Program.

f. Provide appropriate reimbursement for care rendered in the hospital to patients not eligible for CHAMPUS benefits.

g. Encourage beneficiaries to use the services of this agreement rather than other CHAMPUS services for care that, in the absence of the Partnership Program, would require issuance of a Nonavailability Statement.

h. Notify the appropriate Fiscal Intermediary of all additions to or deletions from the attached list of practitioners by the participating health care entity.

2. The Participating Health Care Entity shall:

a. Meet the licensing and privileging requirements of the MTF (DoD Directives 6025.4 and 6025.2).

b. Monitor overall outpatient services that are directly related to the outpatient medical care of patients referred as a part of this agreement except that portion of care rendered by or at the direction of Department of the Army health care providers.

c. Provide full professional liability insurance covering acts or omission of such health care provider, as well as those of support personnel not covered by 10 U.S. C. 1089 and other resources supporting that provider as part of this agreement to the same extent as is usual and customary in civilian practice in the community.

d. Provide personal liability coverage applicable to clinical privileges granted with indemnification of the U.S. Government as a third-party beneficiary.

e. Provide full disclosure of all information, including but not limited to past performance as required by the credentialing process.

f. Abide by hospital bylaws and DoD and Military Department regulations with regard to Utilization Review and Quality Assurance Directives, including but not limited to inservice training, maintenance of records, utilization review, performance evaluation, release of medical information, and credentialing.

g. Abide by Department of the Army requirements concerning the nature of limited privileged communication between patient and health care provider as may be necessary for security and personnel reliability programs.

h. Use all available Department of the Army resources; that is, specialty consultations, ancillary services, and equipment and supplies for the optimal care of patients under this agreement.

i. Adhere to the CHAMPUS Health Care Provider Agreement (see Annex A) and claim submission requirements concerning allowable payment for services rendered.

j. Maintain the currency of the attached list of practitioners by immediately notifying the hospital of all additions and deletions and comply with the preceding articles of agreement for each addition.

SEP 1 2 1989

k. Provide clerical and nursing personnel necessary for the proper care and management of patients under this Memorandum of Understanding.

C. OTHER CONSIDERATIONS

1. Neither party shall assign, transfer, convey, sublet, or otherwise dispose of this agreement or the right, title, or interest therein, or the power to execute such agreement, to any other person, company, or corporations, without the other party's previous written consent.

2. In the event of illness or incapacity rendering a participating health care practitioner incapable of delivering services, care for patients under this agreement shall be transferred to other participating health care practitioners at the discretion of the commander of Bayne Jones Army Community Hospital.

3. The minimum term of this agreement is 1 year with the option to renew for a 2-year period based upon mutual agreement. Termination of this agreement shall be predicated upon satisfactory written notice to the other party not less than 90 days before the proposed termination date. However, the 90-day notice may be waived by mutual consent of the parties to the agreement or unilaterally for the convenience of the government.

4. It is understood that the participating health care entity shall abide by Department of the Army rules concerning the confidentiality of patient records, as embodied in the Privacy Act of 1974.

5. Participating health care entities shall abide by Department of the Army regulations concerning release of information to the public, including advance approval from the Department of the Army before publication of technical papers in professional and scientific journals.

6. It is understood that no care rendered pursuant to this agreement will be a part of a study, research grant, or other test without the written consent of the hospital, OCHAMPUS, and the Assistant Secretary of Defense (Health Affairs).

7. The hospital's liability for actions of its employees (hospital staff and Military Department practitioners, but excluding participating health care entities) is governed by Title 10, United States Code, Section 1089.

8. Partnership providers may not refer beneficiaries to themselves, the provider's group, or any organization where conflict of interest may result. The MTF commander may waive this requirement on a case-by-case basis when an acceptable alternative referral source is not available.

SEP 1 2 1989

IN WITNESS WHEREOF, each of the parties hereunto has executed this agreement effective on this 2nd day of October 1989.

PARTICIPATING HEALTH CARE ENTITY

RS Blatt

RICHARD S. BLATT
Vice-President
Sterling Emergency Medicine, Inc.
4069 E. Galbraith Road
Cincinnati, Ohio 45236

UNITED STATES OF AMERICA

Fred A. Cecere

FRED A. CECERE
COL, MC
Commanding

SEP 1 2 1989

ANNEX A TO: MEMORANDUM OF UNDERSTANDING BETWEEN THE BAYNE-JONES ARMY COMMUNITY HOSPITAL AND STERLING EMERGENCY MEDICINE, INC., CITY OF FORT POLK STATE OF LOUISIANA

DEPARTMENT OF DEFENSE
OFFICE OF CIVILIAN HEALTH AND MEDICAL PROGRAM
OF THE
UNIFORMED SERVICES
AURORA, COLORADO 80045

CHAMPUS HEALTH CARE PROVIDER AGREEMENT

THIS AGREEMENT, entered into as of the 2nd day of October, 1989, by and between Sterling Emergency Medicine, Inc., hereinafter referred to as the participating health care provider, and the United States of America, hereinafter referred to as the government.

WITNESSETH:

WHEREAS, the participating health care provider entered into a Memorandum of Understanding whereby staff at Bayne-Jones Army Community Hospital, hereinafter referred to as the hospital, were conditionally granted by the government through the Department of the Army for general medical care of beneficiaries of the Civilian Health and Medical Program of the Uniformed Services, hereinafter referred to as CHAMPUS; and

WHEREAS, the government, through the Department of the Army is interested in achieving optimum use of existing Health Benefits Program resources authorized under Title 10, United States Code, Chapter 55;

NOW, THEREFORE, in consideration of the aforementioned premises, the parties hereto agree as follows:

1. That the participating health care provider shall apply, have approved, and exercise staff privileges as an independent practioner at the hospital for outpatient services that are directly related to the general medical services, furnished to all patients who are CHAMPUS beneficiaries pursuant to the terms of the Memorandum of Understanding entered into with the government.

2. That the participating health care provider shall accept the CHAMPUS-determined allowable charge as payment in full for all CHAMPUS-authorized general medical services furnished to CHAMPUS beneficiaries pursuant to this Agreement.

3. That the participating health care provider shall bill the CHAMPUS office only the approved allowable charge for such services, and will neither bill nor collect from the CHAMPUS beneficiary or sponsor any amounts exceeding the CHAMPUS-determined allowable charge for the authorized services.

SEP 1 2 1989

4. That the participating health care provider, or authorized representative, shall sign the CHAMPUS claim form as prepared by the hospital, confirming that the specific medical care itemized on the claim form was in fact rendered to the beneficiary or patient on the dates indicated and that the health care provider agrees to the CHAMPUS participation agreement on the claim form as modified by this Agreement.

5. That for the purposes of this Agreement only, the CHAMPUS-determined allowable charge shall be the fee schedule attached hereto as attachment 2, as negotiated by the parties and reviewed annually, but in no event shall such allowable charge exceed the prevailing charges, as determined by CHAMPUS methodology, for similar services in the same locality where the participating health care provider furnished the medical care. The participating health care provider shall furnish all service charge information requested by the government necessary for negotiation and review of the attached fee schedule. The participating health care provider is responsible for his or her own self-employment social security tax and income tax. The government will not withhold such payments from fees paid as provided herein.

6. Except as modified by this Agreement, care furnished by the participating health care provider under CHAMPUS shall be subject to DOD 6010.8-R, "Implementation of Civilian Health and Medical Program of the Uniformed Services (CHAMPUS)," January 16, 1977, as amended and policy established by OCHAMPUS.

7. That this Agreement shall continue in effect through 1 October 1990, unless sooner terminated by mutual written agreement of the parties or as otherwise provided hereinafter.

8. That this Agreement may be terminated by the government upon documentation of suspension or revocation of clinical privileges, failure to abide by the provisions of the Agreement, abuse of its provisions or abuse or fraud committed against any agency of the government by the participating health care provider, and that pending any investigation of fraud or abuse, payments due and owing by the government under this Agreement may be suspended by the government.

PARTICIPATING HEALTH CARE PROVIDER

RICHARD S. BLATT
VICE-PRESIDENT
Sterling Emergency Medicine, Inc.
4069 E. Galbraith Road
Cincinnati, Ohio 45236

UNITED STATES OF AMERICA

FRED A. CECERE
COL, MC
Commanding

SEP 1 2 1989

ANNEX B TO: MEMORANDUM OF UNDERSTANDING BETWEEN THE BAYNE-JONES ARMY COMMUNITY HOSPITAL AND STERLING EMERGENCY MEDICINE, INC., CITY OF FORT POLK STATE OF LOUISIANA

We agree to accept the CHAMPUS determined allowable charges for the below listed

CPT CODE	DESCRIPTION	RATE
90000	NEW PATIENT, BRIEF	$23.47
90010	NEW PATIENT, LIMITED	26.00
90015	NEW PATIENT, INTERMEDIATE	39.00
90040	ESTABLISHED PATIENT, BRIEF	16.74
90050	ESTABLISHED PATIENT, LIMITED	19.50
90060	ESTABLISHED PATIENT, INTERMEDIATE	22.75

R S BLATT

RICHARD S. BLATT
Vice-President
Sterling Emergency Medicine, Inc.
4069 E. Galbraith Road
Cincinnati, Ohio 45236

Table 2

WAYNE-JONES ACH

RUN DATE: 02 MAY 1990 TIME: 1112
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 OCT 1989 - 31 OCT 1989
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP. - MINUTES)

PATIENT CATEGORY	E	: 2
PATIENT CATEGORY	N	: 14
PATIENT CATEGORY	U	: 10
PATIENT CATEGORY		: 31
PATIENTS W/TIME ARR>DISP OF	>180	: 57
PATIENT CATEGORY	E	: 23
PATIENT CATEGORY	N	: 675
PATIENT CATEGORY	U	: 101
PATIENT CATEGORY		: 534
PATIENTS W/TIME ARR>DISP OF	<180	: 1333

(Above) All Dispositions = Total Patients Presented (Table)

TABLE 2

BAYNE-JONES ACH

RUN DATE: 01 MAY 1990 TIME: 1341
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 DEC 1989 - 31 DEC 1989
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E	: 2
PATIENT CATEGORY N	: 30
PATIENT CATEGORY U	: 6
PATIENT CATEGORY	: 45
PATIENTS W/TIME ARR>DISP OF >180	: 83
PATIENT CATEGORY E	: 6
PATIENT CATEGORY N	: 568
PATIENT CATEGORY U	: 56
PATIENT CATEGORY	: 458
PATIENTS W/TIME ARR>DISP OF <180	: 1088

TABLE 2

BAYNE-JONES ACH

RUN DATE: 01 MAY 1990 TIME: 1224
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 JAN 1990 - 31 JAN 1990
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E	: 3
PATIENT CATEGORY N	: 72
PATIENT CATEGORY U	: 19
PATIENT CATEGORY	: 71
PATIENTS W/TIME ARR>DISP OF >180	: 165
PATIENT CATEGORY E	: 6
PATIENT CATEGORY N	: 983
PATIENT CATEGORY U	: 73
PATIENT CATEGORY	: 478
PATIENTS W/TIME ARR>DISP OF <180	: 1540

TABLE 2

BAYNE-JONES ACH

RUN DATE: 01 MAY 1990 TIME: 0932
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 FEB 1990 - 28 FEB 1990
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E : 2

PATIENT CATEGORY N : 43

PATIENT CATEGORY U : 16

PATIENT CATEGORY : 8

PATIENTS W/TIME ARR>DISP OF >180 : 69

PATIENT CATEGORY E : 12

PATIENT CATEGORY N : 1060

PATIENT CATEGORY U : 78

PATIENT CATEGORY : 49

PATIENTS W/TIME ARR>DISP OF <180 : 1199

TABLE 2

BAYNE-JONES ACH

RUN DATE: 01 MAY 1990 TIME: 1137
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 MAR 1990 - 31 MAR 1990
SUMMARY OF PTS SEEN (ALL DISPOSITIONS), MON - FRI ONLY, 1500 - 2300

Arr Time

ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E : 1

PATIENT CATEGORY N : 98

PATIENT CATEGORY U : 31

PATIENT CATEGORY : 3

PATIENTS W/TIME ARR>DISP OF >180 : 133

PATIENT CATEGORY E : 14

PATIENT CATEGORY N : 1148

PATIENT CATEGORY U : 117

PATIENT CATEGORY : 26

PATIENTS W/TIME ARR>DISP OF <180 : 1305

BAYNE-JONES ACH

PERSONAL DATA - PRIVACY ACT OF 1974

RUN DATE: 02 MAY 1990 TIME: 1043
PAGE: 1

EMERGENCY ROOM - PERIOD 01 OCT 1989 - 31 OCT 1989
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY	N	: 12
PATIENT CATEGORY	U	: 5
PATIENT CATEGORY		: 22
PATIENTS W/TIME ARR>DISP OF	>180	: 39
PATIENT CATEGORY	E	: 18
PATIENT CATEGORY	N	: 407
PATIENT CATEGORY	U	: 35
PATIENT CATEGORY		: 399
PATIENTS W/TIME ARR>DISP OF	<180	: 909

(ABOVE) 'HOME OR DUTY' = TOTAL PATIENTS TREATED (TABLE)

BAYNE-JONES ACH

RUN DATE: 01 MAY 1990 TIME: 1522
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 NOV 1989 - 30 NOV 1989
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY	N	: 18
PATIENT CATEGORY	U	: 5
PATIENT CATEGORY		: 29
PATIENTS W/TIME ARR>DISP OF	>180	: 52
PATIENT CATEGORY	E	: 6
PATIENT CATEGORY	N	: 291
PATIENT CATEGORY	U	: 43
PATIENT CATEGORY		: 401
PATIENTS W/TIME ARR>DISP OF	<180	: 741

BAYNE-JONES ACH

RUN DATE: 01 MAY 1990 TIME: 1332
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 DEC 1989 - 31 DEC 1989
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E : 1

PATIENT CATEGORY N : 22

PATIENT CATEGORY U : 2

PATIENT CATEGORY : 25

PATIENTS W/TIME ARR>DISP OF >180 : 50

PATIENT CATEGORY E : 3

PATIENT CATEGORY N : 226

PATIENT CATEGORY U : 41

PATIENT CATEGORY : 327

PATIENTS W/TIME ARR>DISP OF <180 : 597

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 JAN 1990 - 31 JAN 1990
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E	:	2
PATIENT CATEGORY N	:	58
PATIENT CATEGORY U	:	11
PATIENT CATEGORY	:	52
PATIENTS W/TIME ARR>DISP OF >180	:	123
PATIENT CATEGORY E	:	3
PATIENT CATEGORY N	:	496
PATIENT CATEGORY U	:	56
PATIENT CATEGORY	:	317
PATIENTS W/TIME ARR>DISP OF <180	:	872

BAYNE-JONES ACH

RUN DATE: 01 MAY 1990 TIME: 1136
PAGE: 1

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 MAR 1990 - 31 MAR 1990
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E : 1

PATIENT CATEGORY N : 78

PATIENT CATEGORY U : 14

PATIENT CATEGORY : 1

PATIENTS W/TIME ARR>DISP OF >180 : 94

PATIENT CATEGORY E : 6

PATIENT CATEGORY N : 667

PATIENT CATEGORY U : 83

PATIENT CATEGORY : 22

PATIENTS W/TIME ARR>DISP OF <180 : 778

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 FEB 1990 - 28 FEB 1990
SUMMARY OF PTS SEEN W/DISPOSITION OF 'HOME' OR 'DUTY', MON - FRI ONLY, 1500-2300
ELAPSED TIME BETWEEN ARRIVAL/DISP - MINUTES)

PATIENT CATEGORY E : 1

PATIENT CATEGORY N : 34

PATIENT CATEGORY U : 6

PATIENT CATEGORY : 3

PATIENTS W/TIME ARR>DISP OF >180 : 44

PATIENT CATEGORY E : 6

PATIENT CATEGORY N : 653

PATIENT CATEGORY U : 47

PATIENT CATEGORY : 43

PATIENTS W/TIME ARR>DISP OF <180 : 749

ADVANCED TRIAGE
PROFESSIONAL NURSE GUIDELINES

A. EMERGENT

Condition requires immediate (within minutes to 2 hours) medical evaluation. Delay in assessment or treatment could be harmful to patient. Such a disorder is ACUTE and POTENTIALLY THREATENING TO LIFE OR LIMB.

1. Temperature
   a) Fever over 104 (rectal/axillary 6 months - 2 years or oral over 2 years.
   b) Fever over 100.5 (rectal/axillary under 3 months old or oral in adult cancer patient)
   c) Temperature below 95 rectal (any age)

2. Pulse
   a) Pulse over 120 (adults)
   b) Pulse below 44 (adults)
   c) Irregular pulse (new onset)

3. Respirations
   a) Respirations over 30 (adults) and over 50 (child under 10yrs)
   b) Respirations below 10 (adults) and below 20 (child under 10yrs)

4. Blood Pressure
   a) BP 180/xx or xx/120 or higher
   b) BP 80/xx (adult) or lower

5. Respiratory Distress
   a) Labored breathing, nasal flaring, retractions, blue look to lips or nailbeds, pallor, cyanosis
   b) Asthma with visable distress
   c) Foreign body in airway with visable distress
   d) Trauma or anything compromising airway
   e) Severe allergic reaction

6. Shock or impending shock (low BP with elevated pulse)

7. Injuries
   a) Major/multiple trauma
   b) Uncontrolled bleeding (epistaxis, lacerations, vaginal)
   c) Major burns (over 10% BSA; involves face, hands, feet, or genetalia; any burn in child under one year)
   d) Penetrating injury to eye/face
   e) Chemical injury to eye/face
   f) Open fracture
   g) Extremity injury with severe deformity or no distal pulse
   h) Any injury with neurovascular compromise
   i) Closed head injury with loss of consciousness
   k) Snake bite
   l) Near drowning (even though patient looks well now)

8. Pain
   a) Chest pain of suspected cardiac origin
   b) Neck pain due to recent trauma (less than 48 hours) or associated with stiff neck
   c) Severe abdominal or pelvic pain
   d) Patients in severe pain and suspect kidney stone

9. Decreased Mental Status (new onset)

10. Active seizures or post-ictal

11. Sudden blindness

12. Paralysis (unable to move an extremity) new onset

13. Possible CVA (new onset slurred speech, unilateral paralysis or visual disturbances)

14. Obstetrics
   a) 20 weeks or more pregnant and bleeding vaginally
   b) Active labor, birth imminent (if birth not imminent, these patients go to Labor and Deliver in wheelchair)

15. GI Bleeding (rectal bleeding or blood in vomitus)

16. Suspected child abuse/spouse abuse

17. Toxic ingestion/drug overdose (to include ETOH)

18. Heat or cold injuries

19. Patients who say they are in sickle cell crisis

20. Actively suicidal (talking of killing themselves)

21. Rape/Assault

22. Emotional problems, patient appears unstable

B. URGENT

Condition requires medical attention today (within 12 hours) or danger can ensue. Such a condition is ACUTE BUT NOT IMMEDIATELY LIFE OR LIMB THREATENING.

1. Temperature
   a) 101-104 rectal/axillary in child 6 months to 2 years
   b) 101-104 oral in adult
   c) Sore throat with fever over 102 (except child under 6 months)
   d) UTI with severe discomfort (abdominal or back pain) or temperature over 101

2. Blood Pressure between 140/xx - 180/xx & xx/90 - xx/120.

3. Injuries
   a) Burns (other than major)
   b) Animal bites (not severe with bleeding controlled)
   c) Foreign body in eye; ears/nose (not causing respiratory distress)
   d) Laceration with controlled bleeding
   e) Closed fracture without deformity and with adequate distal pulses

4. Pain
   a) Pain in eye
   b) Back pain due to trauma
   c) Extremity pain with or without swelling
   d) Non-acute pain in patient who suspects kidney stone
   e) Pain with no known injury
   f) Severe rectal pain
   g) Pelvic pain (over 48 hours but less than 2 weeks)
   h) Migraine or severe headache

5. Bleeding, Controlled
   a) Nosebleed
   b) In first 19 weeks of pregnancy
   c) Lacerations
   d) Recent history GI bleeding (not occuring at present)

6. Pain or swelling beneath existing cast without neurovascular compromise

7. Weakness, vertigo, dizziness (without syncopal episode today)

8. Acute intoxication (ETOH)

9. Emotional problems, patient appears stable

10. Uncontrolled vomiting

11. Thrombosed hemorrhoid (per patient)

12. SOB, productive cough without respiratory distress

C. NON-URGENT

Condition is not Emergent or Urgent, thus does not require the immediate resources of an emergency medical services system. Delay in treatment beyond 12 hours or more will not result in harm to the patient.

1. Temperature
   a) Sore throat, temperature below 101.5 (rectal/axillary child; oral in adult)
   b) Suspected UTI without severe pain or without temperature over 101.5 (rectal/axillary in child; oral in adult)
   c) Temperature over 95 and below 101 (rectal/axillary in child; oral in adult)

2. Injuries
   a) Insect bites with vital signs normal and no history of allergic reactions
   b) Trauma to nose with bleeding controlled
   c) Minor trauma over 72 hours old
   d) Wound check/dressing change
   e) Needle stick
   f) Sprains (twisted ankle without obvious deformity)

3. Pain
   a) Ear pain
   b) Chronic pelvic pain (greater than 2 weeks and not severe now)
   c) Menstrual cramps
   d) Chronic back pain
   e) Headache, not severe with vital signs normal
   f) Moderate rectal pain

4. Parasites
   a) Worms in stool
   b) "Crabs", lice
   c) Scabies

5. Rash with vital signs normal

6. Gradual decrease in visual acuity (over several weeks)

7. Gradual decrease in hearing

8. Obstetric/GYN
   a) Vaginal discharge
   b) Suspected pregnancy
   c) Vaginal bleeding, not pregnant, and vital signs normal

9. Constipation

10. Medication refills

11. Viral syndrome

12. History of seizure but not seizing today

13. Patient desires consult to another clinic

14. Patient has appointment in another clinic but does not want to wait for it (and does not fit emergent or urgent category)

TEMPERATURE

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. Elevated Temperature		
a. Above 104 & over 6 mos old Above 100.5 & 6 mos old or less or in adult cancer patient	EMERGENT	Tylenol S.O. per RN. Notify ER MD.
b. 101 - 104 & over 6 mos old	URGENT	Tylenol S.O. per RN
2. Low Temperature		
95 or less with IVAC	EMERGENT	To ER treatment bay for recheck with K-Temp probe Notify ER MD.
3. Borderline Temperature		
a. Above 95 but less than 101 and over 6 mos old	NON-URGENT	Screen other complaints.
b. Above 95 but less than 100.5 temperature and 6 mos old or less	NON-URGENT	Repeat temp every 2 hrs if wait >2 hours
4. Possible Heat Injury		
Change in mental status, or temperature > 104, or sweating & c/o dizzy, weak, nausea, or abdominal muscle/extremity cramps.	EMERGENT	Notify ER MD.
c/o dizzy, weak, nausea, or abdominal/extremity muscle cramps and temperature below 100.	URGENT	To treatment area as soon as bed available. Oral fluids.
5. Possible Cold Injury		
History of exposure, or frost bite, or any suspected cold injury	EMERGENT	Notify ER MD.

PULSE

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. New onset irregular pulse	EMERGENT	
2. Pulse rate over 120/minute. in adult (over 10 years old)	EMERGENT	Cardiac monitor 12 Lead EKG Notify MD.
3. Pulse rate below 44/minite in adult (over 10 years)	EMERGENT	
4. Pulse rate over 44/minute but less than 120/minute in adult (over 10 years old)	NON-URGENT	Waiting Room

BLOOD PRESSURE

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. BP 80/xx or below in adult (10 yrs or older)	EMERGENT	Repeat BP in triag Notify RN/MD STAT Place in wheelchai if dizzy & weak.
2. BP over 180/xx or xx/120	EMERGENT	Repeat BP in triag Notify RN/MD STAT
3. BP between 140/xx - 180/xx and xx/90 - xx/120	URGENT	Screen other symptoms
4. BP below 140/xx & xx/90 with systolic over 80	NON-URGENT	Screen other symptoms.

RESPIRATION

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. Respiration rate 30 or more in adult (10 yrs or more) or 50 or more in child (less than 10 yrs old)	EMERGENT	To ER treatment bay in wheelchair STAT...place on litter and evaluate syptoms.
2. Respiration rate 10 or less in in adult (10 yrs or more) or 20 or less in child (less than 10 yrs old)	EMERGENT	
3. Acute respiratory distress a. Retractions or b. Cyanosis or c. Decreased mental status or d. Nasal flaring or e. Labored breathing or f. Audible wheezing or g. Dyspnea at rest	EMERGENT	Oxygen: Adult - 6LPM by NP unless hx COPD, then 2LPM. Child- 4-6LPM Mask Notify MD STAT
4. Mild respiratory distress a. Productive cough with temperature over 102 b. Productive cough with streaks of blood (not severe).	URGENT	1. Tylenol S.O. (for fever) by RN. 2. Screen other symptoms.
5. Respiratory symptoms with no acute distress a. Non-productive cough b. Cold symptoms (sore throat, runny nose, etc.)	NON-URGENT	To Waiting Room.

CARDIAC

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. Chest pain of suspeted cardiac origin, based upon following: a. Pain crushing, pressure burning, heaviness, or severe with radiation into neck or arms. b. Pain associated with sweating, nausea, vomiting, SOP, dizziness, pallor or cyanosis. c. History of cardiac problems d. Over 40 years old e. Feel heart racing/pounding	EMERGENT	Take to ER Bay immediately Place on litter and begin: Cardiac monitor. Oxygen 2-6LPM NP (COPD pt - 2 LPM) Notify MD May begin cardiac standing orders
2. Chest pain made worse with deep breath (pleuritic) without symptoms of suspected cardiac origin AND without respiratory distress.	URGENT	V.S. Screen
3. Chest pain that is associated with none of symptoms in #1 above, not worse with deep breath, but chest tender to palpation or twisting thorax.	NON-URGENT	V.S. Screen

PEDIATRIC
(OTHER SAME AS ADULT)

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
Lethargy or decreased mental atus, alertness; Difficult to arouse	EMERGENT	To ER treatment bay Notify MD.
Temp over 104 & over 6 mos old Temp over 100.5 & 3 mos old or less Rectal	EMERGENT	Tylenol standing order by RN for child over 6 mos
Signs of dehydration (no tears, dry mouth, poor skin turgor, decreased urination	EMERGENT	To ER treatment bay Notify MD.
Respiratory Distress (cyanosis, pallor, flaring nostrils, retractions, very shallow respirations, periods of apnea, visable respiratory distress, rate over 55, stridor)	EMERGENT	To ER treatment bay Oxygen by mask at 4 LPM. Notify MD STAT.
Active Bleeding	EMERGENT	
Possible toxic ingestion	EMERGENT	
Severe Pain (doubled over, moaning)	EMERGENT	
Snake bite	EMERGENT	
Active seizure	EMERGENT	To ER treatment bay Notify MD.
"Does not look right"	EMERGENT	
Suspected child abuse	EMEGENT	
Animal bite(injury not severe)	URGENT	Waiting Room unless injuries warrant other care.
Active vomiting or diarrhea	URGENT	
Temp 101 -104 & over 6 mos old	URGENT	Tylenol S.O. by RN Notify MD.
Earache with temp below 101 and over 6 mos old	URGENT	
Temp under 101 in well-appearing child over 6 mos old	NON-URGENT	
Rash with normal vital signs	NON-URGENT	Waiting Room.

ENT

PATIENT PRESENTS WITH:	TRIAGE, CATEGORY	ACTION
1. Foreign body in airway (compromising respiration)	EMERGENT	To ER treatment bay Open airway Oxygen Adult-6LPM by NP Child-4LPM by mask Notify MD.
2. Sore throat with muffled voice or drooling	EMERGENT	
3. Trauma, infection, or anything that is compromising airway	EMERGENT	
4. Sudden blindness uni or bifocal	EMERGENT	To ENT Room. Visual acuity. Notify MD.
5. Penetrating or chemical injury to eye	EMERGENT	To ENT Room. Do not move F.B. Copious irrigation chemical with NS. Notify MD
6. Blood from ear with history head trauma	EMERGENT	To RX Area
7. Red, very painful eye	EMERGENT	To ENT Room. Visual acuity. Notify MD.
8. Nosebleed, uncontrolled	EMERGENT	To ENT Room. Pinch nostrils. Sit pt up Lean forward & spit blood.
9. Foreign body of nose/ears	URGENT	
10. Blood from ear (no head trauma)	URGENT	To Waiting Room
11. Trauma not compromising the airway	URGENT	
12. Sore throat with temp below 104	URGENT	Tylenol S.O. by RN To Waiting Room
13. Foreign body in eye (non-penetrating)	URGENT	To Eye Room. Visual acuity. Notify MD.
14. Pain in eye	URGENT	Visual Acuity To Waiting Room
15. Nosebleed, controlled	URGENT	To Waiting Room
16. Nasal fx, bleeding controlled	URGENT	To Waiting Room Ice pack to nose.
17. Graudal decrease in visual acuity (over several weeks)	NON-URGENT	
18. Red, non-painful eye	NON-URGENT	
19. Gradual decrease in hearing	NON-URGENT	To Waiting Room

NEURO/PSYCHIATRIC

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. Closed head injury with abnormal vital signs	EMERGENT	
2. Seizures, active or post-ictal period;	EMERGENT	To treatment bay Oxygen: Adult – 6 LPM by NP Child – 4-6 LPM by mask.
3. Altered mental status, new onset	EMERGENT	
4. Drug overdose &/or suicide ideation Emotional problems/pt unstable	EMERGENT	Notify MD STAT To treatment bay
5. ETOH withdrawal w/altered mental status or vital sign changes	EMERGENT	To treatment area Notify MD
6. Suspected stroke (new onset paralysis 1 side less than 72hr)	EMERGENT	
7. Headache with history head trauma less than week ago or with stiff neck or visual problems.	EMERGENT	
8. Paralysis (more than 72 hrs)	URGENT	
9. Vertigo	URGENT	
10. Dizziness – if snycopal event occurred within past 12 hours	URGENT	Notify MD. To ER treatment bay when bed available.
11. Migraine or headache not associated with symptoms in #7 above	URGENT	
12. Closed head injury, vital signs WNL & mental status WNL	URGENT	
13. Acute intoxication, vital signs WNL & mental status WNL	URGENT	To ER treatment bay or Exam Room.
14. Emotional problems, patient appears stable	URGENT	Notify MD.
15. History of syncope, VS WNL	NON-URGENT	
16. Headache, not severe, VS WNL; neurologically intact (GCS 15, moving all extremities & PEARL)	NON-URGENT	To Waiting Room
17. Request for psychiatric referral & patient appears stable without suicidal ideation.	NON-URGENT	

GI/GU

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. Obvious blood vomited or in stool (also coffee ground material)	EMERGENT	
2. Evidence of bleed and change in vital signs (orthostatics positive or hypotension and/or tachycardia)	EMERGENT	To ER treatment bay
3. Severe abdominal pain	EMERGENT	IV access with NS Notify MD.
4. Nausea/vomiting/diarrhea with change in vital signs (orthostatics positive or hypotension and/or tachycardia)	EMERGENT	
5. Recent history (72 hrs) of blood of coffee ground material, vomited or in stool	URGENT	
6. Uncontrolled vomiting	URGENT	
7. Severe rectal pain	URGENT	To ER treatment bay when bed available.
8. UTI with severe discomfort	URGENT	Get C.C. for U/A, C&S & HCG; Waiting Rm
9. Constipation	NON-URGENT	
10. Parasites (worms, crags, lice)	NON-URGENT	
11. Mild rectal pain	NON-URGENT	
12. Nausea, vomiting, diarrhea with vital signs WNL & no signs dehydration	NON-URGENT	To Waiting Room
13. History of rectal bleeding, not active, 72 hours	NON-URGENT	
14. Hemorrhoids, no bleeding	NON-URGENT	
15. Suspected UTI - no severe discomfort	NON-URGENT	Get C.C. U/A, C&S & HCG; To Waiting Room

ORTHOPEDIC/SURGICAL

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. Open fracture	EMERGENT	
2. Extremity injury with severe deformity or neurovascular compromise (decreasing pulse, sensation or movement)	EMERGENT	To ER treatment area; Splint; Pressure dressing to control bleeding; Notify MD.
3. Laceration with uncontrolled bleeding	EMERGENT	
4. Neck pain secondary to trauma less than 48 hours or associated with stiff neck.	EMERGENT	C-Collar & backboard; Notify MD.
5. Major burns or burn in child under 1 year old	EMERGENT	To treatment bay VS; Notify MD
6. Pain beneath existing cast without neurovascular compromise	URGENT	To Waiting Room
7. Laceration with controlled bleeding	URGENT	To Waiting Room
8. Closed fracture suspected without deformity or neurovascular compromise	URGENT	Splint; X-ray; Waiting Room
9. Back pain secondary to trauma in last 72 hours	URGENT	Position of Comfort; Waiting Rm
10. Burns (not major & over 1 yr old) (Major = over 10% BSA; of face, hands, feet, genetalia; in child under 1 yr)	URGENT	To treatment bay when bed available; Notify MD.
11. Sprains/bruises without obvious deformity	NON-URGENT	
12. Extremity pain without neurovascular compromise	NON-URGENT	
13. Back pain - chronic	NON-URGENT	To Waiting Room
14. Minor trauma, 72 hours old	NON-URGENT	#11 - ice pack
15. Wound check	NON-URGENT	
16. Needle stick	NON-URGENT	

OB-GYN

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. Pelvic pain and change in vital signs or severe pelvic pain alone	EMERGENT	To GYN Room Notify MD
2. >20 weeks pregnant, profuse bleeding	EMERGENT	Notify MD
3. Prolapsed umbilical cord	EMERGENT	#3-Trendelenberg
4. 20 weeks or more gestation with abdominal pain/labor or vaginal bleeding (not profuse)	EMERGENT	To L&D per wheelchair.
5. Rape/Sexual Assault	EMERGENT	To treatment area
6. Pelvic pain over 48 hours, vital signs WNL	URGENT	To Waiting Room
7. Bleeding (not profuse)< 20 weeks pregnant	URGENT	Notify MD
8. Heavy post-partum bleeding (vital signs WNL)	URGENT	
9. Vaginal discharge, rash, itch	NON-URGENT	
10. Suspected pregnancy	NON-URGENT	
11. Suspected V.D.	NON-URGENT	
12. Breast lump	NON-URGENT	
13. Vaginal bleeding in non-pregnancy, vital signs WNL	NON-URGENT	To Waiting Room
14. Chronic pelvic pain (over two weeks)	NON-URGENT	
15. Menstral cramps	NON-URGENT	

SKIN

PATIENT PRESENTS WITH:	TRIAGE CATEGORY	ACTION
1. Severe hives	EMERGENT	To treatment bay Notify MD Cardiac Monitor
2. Severe allergic reaction	EMERGENT	
3. Rash with elevated temperature	URGENT	
4. Animal bites (not severe)	URGENT	To Waiting Room
5. Parasites (worms, crabs, lice)	NON-URGENT	To Waiting Room
6. Rash with vital signs WNL, no connection to medication	NON-URGENT	To Waiting Room
7. Insect bites, vital signs WNL (no history of severe allergic reaction to medications)	NON-URGENT	To Waiting Room

```
BEGIN,1,1,YES,BJACH1,NO;
          CREATE,1:                          !CREATE ENTITIES (PATIENTS) BY
            EX(3,2):MARK(29);                CONINUOUSLY CHECK DISTRIBUTIN
          COUNT:                             !COUNTER FOR ENTITIES ENTERING
            4;                               THE ER
          ASSIGN:                            !ASSIGN PATIENT TYPE BASED ON
            A(1)=DP(1,2);                    RANDOM # & DP DISTRIBUTION
          COUNT:A(1);                        COUNT EACH CATEGORY OF PATIET
          ASSIGN:                            !ASSIGN PATIENT ARRIVAL RATE
            P(3,1)=TF(1,TNOW);               FROM TABLE BASED ON TIME NOW
          BRANCH,1:                          !DETERMINE PATIENT TYPE SO
            IF,A(1).EQ.1,ASG1:               !CAN ASSIGN A PROBABILITY OF
            IF,A(1).EQ.2,ASG2:               !DX FOR EACH PATIENT BY GOING
            IF,A(1).EQ.3,ASG3;               TO SPECIFIC ASSIGN BLOCKS
ASG1      ASSIGN:A(2)=.4231:NEXT(CHOICE);    PROBABILITY OF DX NON-URGENT
ASG2      ASSIGN:A(2)=.4615:NEXT(CHOICE);    PROBABILITY OF DX FOR URGENT
ASG3      ASSIGN:A(2)=1.00:NEXT(CHOICE);     PROBABILITY OF DX EMERGENT
CHOICE    BRANCH,1:                          !EMERGENT AND SERIOUS URGENT
            IF,A(1).EQ.3,MTBED:              ! & AMBULANCE PATIENTS
            IF,A(1).EQ.1,REGBED:             !LESS URGENT & NON-URGENT
            WITH,.38,MTBED:                  !(38%URGENT)
            ELSE,REGBED;                     (62%URGENT)
MTBED     COUNT:5;
          QUEUE,1:                           !BED # 4, 7A, 7B, 8
            MARK(28);
          SEIZE:MTBED;
          TALLY:                             !AVE WAIT FOR MTBED PATIENT
            5,INT(28);                       BEFORE GETTING TO MTBED
          ASSIGN:                            !IDENTIFIES MTBED EQUAL TO 1
            A(3)=1;                          TO COUNT MTBED PAATIENTS
          QUEUE,2:MARK(27);                  WAIT FOR DOC
          SEIZE:DOC;
          TALLY:                             !AVE WAIT FOR MTBED PATIENT
            6,INT(27);                       BEFORE 1ST DOC ENCOUNTER
          DELAY:                             !INITIAL TMT/STABILIZATION OF
            22.05;                           EMERGENT AND SERIOUS URGENT
          RELEASE:                           !RELEASE DOC & GO TO DX
            DOC;
          BRANCH,1:                          !PATIENT TO DX (RX BY DEFAULT)
            WITH,A(2),DX:                    !BASED ON PROBABILITY ASSIGNED
            ELSE,RX;                         WRT TYPE 1,2,or 3 (above)
REGBED    COUNT:6;
          QUEUE,3:                           !BEDS # 1,2,3,5,6
            MARK(26);                        (i.e. NON-MONITORED, CAST)
          SEIZE:REGBED;
          TALLY:                             !AVE WAIT FOR REGBED PATIENT
            7,INT(26);                       BEFORE GETTING TO BED
          ASSIGN:                            !IDENTIFIES REGBED EQUAL TO 2
            A(3)=2;                          TO COUNT REGBED PATIENTS
          QUEUE,4:MARK(25);                  WAIT FOR DOC FOR INITIAL TMT
          SEIZE:DOC;
          TALLY:                             !AVE TIME FOR REGBED PATIENT
            8,INT(25);                       BEFORE 1ST DOC ENCOUNTER
          DELAY:                             !INITIAL TMT/EVAL OF URGENT
            6.29;                            AND NON-URGENT PATIENTS
          RELEASE:DOC;
          BRANCH,1:                          !PATIENT TO DX (RX BY DEFAULT)
            WITH,A(2),DX:                    !BASED ON PROBABILITY ASSIGNED
            ELSE,RX;                         WRT TYPE 1,2,or 3 (above)
DX        COUNT:7;
          DELAY:                             !SEND PATIENT TO DIAGNSTC AREA
            DP(2,2);                         DELAY BY DIANOSTIC PROCEDURE
DOC2      QUEUE,5:MARK(24);
          SEIZE:DOC;
```

```
            TALLY:                                  !HAVE TIME FOR DOC TO EVAL
              9,INT(24);                            DIAGNOSTIC TESTS
            DELAY:                                  !DOC REVIEWS DX RESULTS TO
              6.66;                                 DETERMINE PATIENT DISPOSITION
            BRANCH,1:                               !DETERMINE PATH FOR PATIENT TO
              WITH,.41,CONSULT:                     !TAKE AFTER DIAGNOSTIC
              ELSE,DOCRELRX;                        PROCEDURES HAVE BEEN COMPLETE
DOCRELRX    RELEASE:DOC:NEXT(RX);                   GET RID OF DOC
CONSULT     COUNT:9;
            DELAY:                                  !DOC CONSULTS WITH SPECIALIST
              7.97;                                 PRIOR TO DISPOSITION
            RELEASE:DOC;
RX          COUNT:8;
            BRANCH,1:
              WITH,.049,DOC&NURX:                   !DETERMINE WHO WILL PERFORM
              WITH,.731,D&N&PARX:                   !THE TREATMENT PROCEDURE (&
              WITH,.171,DOC&PARX:                   !ASSOCIATED PROBABILITY) FOR
              ELSE,NU&PARX;                         THE PATIENT
DOC&NURX    QUEUE,6;                                WAIT FOR DOC TO DO RX
            SEIZE:DOC;
            DELAY:                                  !DOC PERFORMS RX PROCEDURE
              9.86;
            RELEASE:DOC;
            QUEUE,7;
            SEIZE:NURSE;
            DELAY:5.73;                             NURSE PERFORMS RX
            RELEASE:                                !PATIENT GOES TO DISPOSITION
              NURSE:NEXT(DSCHRG);
D&N&PARX    QUEUE,8;                                WAIT FOR DOC TO DO RX
            SEIZE:DOC;
            DELAY:9.86;                             DOC PERFORMS RX PROCEDURE
            RELEASE:DOC;
            QUEUE,9;
            SEIZE:NURSE;
            DELAY:5.73;                             NURSE PERFORMS RX
            RELEASE:NURSE;
            QUEUE,10;
            SEIZE:PARA;
            DELAY:25.40;                            PARA PERFORMS RX
            RELEASE:                                !PATIENT GOES TO DISPOSITION
              PARA:NEXT(DSCHRG);
DOC&PARX    QUEUE,11;                               WAIT FOR DOC AND PARA TODO RX
            SEIZE:DOC;
            DELAY:9.86;                             DOC PERFORMS RX PROCEDURE
            RELEASE:DOC;
            QUEUE,12;
            SEIZE:PARA;
            DELAY:25.40;                            PARA PERFORMS RX
            RELEASE:                                !PATIENT TO DISPOSITION
              PARA:NEXT(DSCHRG);
NU&PARX     QUEUE,13;                               WAIT FOR NURSE TO DO RX
            SEIZE:NURSE;
            DELAY:                                  !NURSE PERFORMS RX
              5.73;
            RELEASE:NURSE;
            QUEUE,14;
            SEIZE:PARA;
            DELAY:25.40;                            PARA PERFORMS RX
            RELEASE:PARA:NEXT(DSCHRG);              PATIENT GOES TO DISPOSITION
DSCHRG      BRANCH,1:
              WITH,.146,ADMIT:
              ELSE,RELBEDS;
ADMIT       COUNT:10;
            BRANCH,1:
              WITH,.5,NADMIT:
              ELSE,PADMIT;
```

```
          SEIZE:NURSE;
          DELAY:10.23;                          NURSE ADMITS TO HOSPITAL
          RELEASE:                              !PATIENT ADMITTED TO HOSPITAL
            NURSE:NEXT(RELBEDS);                BE SURE TO RELEASE BED
PADMIT    QUEUE,16;                             WAIT FOR PARA TO ADMIT
          SEIZE:PARA;
          DELAY:14.18;                          PARA ADMITS TO HOSPITAL
          RELEASE:                              !PATIENT ADMITTED TO HOSPITAL
            PARA:NEXT(RELBEDS);                 BE SURE TO RELEASE BED
;
;
;Part of the progrma below this point although present is deactivated due
;the presence of the semi-colon in front of each line of code
;To activate the code remove the semi-colon.
;
;
;TRANSFER BRANCH,1:
;           WITH,.4,GROUND:                     !TRANSFER BY GROUND AMBULANCE
;           ELSE,AIR;                           OR MEDEVAC
;GROUND    QUEUE,4;                            TRANSFER
;          SEIZE:DOC;
;          DELAY:                              !GET ACCEPTING PHYSICIAN AND
;            15;                               ARRANGE FOR GROUND TRANSFER
;          RELEASE:DOC;
;          QUEUE,12;
;          QUEUE,12;
;          SEIZE:NURSE;
;          DELAY:                              !NURSE PREPARES PATIENT FOR
;            15;                               TRANSFER TO ANOTHER FACILITY
;          RELEASE:NURSE;
;          QUEUE,16;                           WAIT FOR PARA TO GET AMBULNCE
;PARA      SEIZE:PARA;
;          DELAY:                              !MAKE AMBULANC READY-TRANSPOR
;            90;                               PATIENT TO ACCEPTING FACILITY
;          RELEASE:                            !MAKE SURE BED IS RELEASED
;            PARA:NEXT(RELBEDS);               AFTER PATIENT IS TRANSFERRED
;AIR       QUEUE,3;                            WAIT FOR AIREVAC
;          SEIZE:DOC;
;          DELAY:                              !GET ACCEPTING PHYSICIAN AND
;            15;                               ARRANGE FOR AIR TRANSFER
;          RELEASE:DOC;
;          QUEUE,11;                           WAIT FOR NURSE
;          SEIZE:NURSE;
;          DELAY:                              !NURSE PREPARES PATIENT FOR
;            15;                               TRANSFER TO ANOTHER FACILITY
;          RELEASE:                            !MAKE SURE BED IS RELEASED
;            NURSE:NEXT(RELBEDS);              AFTER PATIENT IS DISCHARGED
;
;
;The program below this point is active
;
;
RELBEDS   BRANCH,1:
            IF,A(3).EQ.1,MTREL:                !DETERMINE TYPE OF BED BEING
            ELSE,REGREL;                       OCCUPIED BY PATIENT
MTREL     RELEASE:                             !RELEASE MONITOR/TRAUMA BED
            MTBED:NEXT(TOTAL);
REGREL    RELEASE:REGBED:NEXT(TOTAL);          RELEASE REGULAR BEDS
TOTAL     TALLY:                               !FIGURE TIME IN SYSTEM
            A(1),INT(29);
          TALLY:4,INT(29):DISPOSE;             DISPOSE ALL CATEGORIES
END;
```

MONTHLY CALENDAR

MONTH OF Dec

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 Sheridan 0600-1800 Potts 0800-2000 Vinh 1600-MN Jehl 2000-0800	2 Reed 0800-2000 Soleh Noon-MN F.P. 2000-0800 other 1000-2200
3 Soleh 0800-2000 Sheridan 1000-2200 F.P. 2000-0800	4 Sheridan 0600-1800 Jehl 0800-2000 Spoon 1600-MN Potts 2000-0800	5 Spoon 0800-2000 Jehl 0800-2000 Vinh 1600-MN Potts 2000-0800 Sheridan off WE	6 Spoon 0800-2000 Sheridan 1000-2200 Potts 2000-0800 Jehl off WE	7 Spoon 0800-1600 Sheridan 0600-1800 Jehl Noon-MN Potts 2000-0800	8 Sheridan 0800-2000 Jehl 1000-2200 Potts 2000-0800	9 Reed 0800-2000 Vinh Noon-MN Jehl 2000-0800
10 0800-2000 Potts 1000-2200 Vinh Noon-MN F.P. 2000-0800	11 Sheridan 0600-1800 Spoon 1600-MN Potts 0800-2000 Jehl 2000-0800	12 Spoon 0800-2000 Sheridan 1000-2200 Jehl 2000-0800 Potts off WE	13 Spoon 0800-2000 Potts 1000-2200 Jehl 2000-0800 Sheridan off WE	14 Spoon 0800-1600 Potts 1000-2200 Jehl 2000-0800 Sheridan off WE	15 Spoon 0800-2000 Sheridan 1000-2200 Potts 2000-0800 Jehl off WE	16 Reed 0800-2000 Sheridan 1000-2200 (Corsetti 4-10) Jehl 2000-0800
17 Spoon 0800-2000 Sheridan 1000-2200 Potts 2000-0800	18 Spoon 0800-1600 Sheridan 0800-2000 Jehl 2000-0800 Potts off WE	19 Spoon 0800-2000 Sheridan 1000-2200 Jehl 2000-0800 Potts off WE	20 Spoon 1600-MN Sheridan 0800-2000 Jehl 2000-0800 Potts off Xmas Eve	21 Spoon 0800-2000 Vinh 1600-MN Potts 2000-0800 Jehl off Xmas Sheridan Leave	22 Spoon 0800-2000 Vinh 1000-MN Potts 2000-0800 Jehl off Sheridan Leave	23 Reed 0800-2000 Spoon Noon-MN Potts 2000-0800 Sheridan Leave
24 Jehl 0800-2000 Potts Noon-MN Quintana MN-0800 Sheridan Leave	25 Jehl 0800-2000 Potts Noon-MN Q MN-0800 S-Leave	26 Jehl 0800-2000 Potts 2000-0800	27 Jehl 0800-2000 Konjoyan 1600-MN Potts 2000-0800	28 Sheridan 0800-2000 Allen 2000-0800 Potts Leave, Jehl off WE	29 Sheridan 0800-2000 Jehl 10-2200 Allen 2000-0800 P Leave	30 Reed 0800-2000 Jehl 1000-2200 Sheridan 2000-0800 Potts L

10-10 10-10 10-10 10-10

Division

MEDDAC Form 387
29 Apr 76 Ft. Polk

(31) Jehl 0800-2000
Sheridan 2000-0800

TRAUMA SERVICE GROUP
An Emergency and Trauma Care Consortium

Dec

AMENDED: 12/06/89

Bayne-Jones Army Community Hosp.
Emergency Room December 1989
(318) 535-3368/3369/3363

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1/ 1b- 2b-Vinh	2/ 1a-Read *2a-Saleh
3/ *1a-Saleh 2a-	4/ 1b- 2b-Wither-spoon	5/ 1a-Wither-spoon 2b-Vinh	6/ 1a-Wither-spoon 2b-	7/ 1b-Wither-spoon 2b-	8/ 1b- 2b-Booker	9/ 1a-Read 2a-Vinh
10/ 1a-Read-7pm 2a-Vinh	11/ 1b-Lynds 2b-Wither-spoon	12/ 1a-Wither-spoon 2b-Lynds	13/ 1a-Wither-spoon 2b-Lynds	14/ 1b-Wither-spoon 2b-Lynds	15/ 1a-Wither-spoon 2b-	16/ 1a-Read 2a-
17/ 1a-Wither-spoon 2a-	18/ 1b-Wither-spoon 2b-	19/ 1a-Wither-spoon 2b-Baquet	20/ 1a-Baquet 2b-Wither-spoon	21/ 1a-Wither-spoon 2b-Vinh	22/ 1a-Wither-spoon 2b-Vinh	23/ 1a-Read 2a-Wither-spoon
24/ 1a- 2a-	25/ 1a- 2b-	26/ 1a- 2b-	27/ 1a- 2b-Konjoyan	28/ 1a- 2b-	29/ 1a- 2b-	30/ 1a-Read 2a-
31/ 1a- 2a-	1/ 1a- 2b-					

Please notify Chuck Stephens of any scheduling problems or changes: 1-800-TRAUMA-6

SHIFTS: 1a=8am to 8pm
1b=8am to 4pm
2a=Noon to Midnight (Was 2)
2b=4pm to Midnight (Was 1)

TSG Representatives on call:
Beepers: 215-734-6369
215-487-5090
(after beep enter # to be called)
*Pending Credentialing

Suite 114, Scott Plaza Two Philadelphia, PA 19113
FAX 215-521-1475 ■ 215-521-5100 ■ 800-TRAUMA-6

NURSING SERVICE PERSONNEL TIME SCHEDULE

For use of this form, see AR 40-407; the proponent agency is the Office of The Surgeon General.

DATA BEGINS ON (Inclusive dates) [redacted] 1 Dec

DUTY TIME, CLASS TIME, OR OFF-DUTY STATUS

TITLE	LAST NAME	DUTY	SUN.	MON.	TUE.	WED.	THURS.	FRI.	SAT.
			[redacted]	[redacted]	12	13	14	15	16
SGT	HUFF, JOSEPH 91B	ACTING NCOIC	DO	1	1	1	1	1	DO
SGT	SMITH, JOHNNIE	91A	SD	(2)	(2)	(2)	DO	DO	1
SGT	ROSE, OLLIE	91B	DO	DO	(2)	(2)	(3)	(2)	2
SGT	MALDONADO, EDWIN	91B	—	—	9 L	B 3 hol	h	—	—
SPC	HANEY, CLIFFORD	91A	2	(2)	(2)	(2)	DO	DO	2
SPC	MARIONE, RICHARD	91A	[redacted]	DO	DO	3	3	3	3
PFC	CHITURAS, JONATHON	91A	DO	—	E	M	T	—	DO
PV2	GOSS, BRIAN	91A	3	JNH 3	3	DO	DO	3	3
			1	1	4	3	2	2	
MR	ESTES, LEROY	EMT	1	1	1	1	1	DO	DO
MR	BRANNAN, CLIFFORD	EMT	1	1	1	1	1	LV	DO
MR	BAILEY, KENNETH	EMT	1	1	1	DO	DO	1	1
MR	TILGHMAN, JESSIE	EMT	LV	LV	LV	LV	DO	2	2
MR	WARREN, ROBERT	EMT	2	DO	DO	(2)	(2)	(2)	2
MR	JONES, MIKE	EMT	8 LV	3	3	3	AL	DO	DO
MR	FRANOVICH, RICKY	EMT	3	3	3	3	DO	DO	3
MR	DAVENPORT, RONALD	EMT	SK 3	3	3	3	3	DO	DO
MR	PROPST, EDWARD	EMT	DO	DO	3	3	3	3	3
MR	WILLIS, DAVID	EMT	DO	1	1	1	1	1	DO
MS	CLARK, RENE	MED CLK	1	2	DO	DO	12-20	12-20	1
MS	WILLIAMS, PRUNELLA	MED CLK	12-20	1	1	12-20	DO	DO	2
MS	WILSON, JUNE	MED CLK	DO	DO	2	2	2	2	2
MS	REED, DEBORAH	MED CLK	2	DO	DO	1	1	1	DO

SIGNATURE OF HEAD NURSE

(Per 3-11 shift) Number of Pams (6-8-X) 6 7 8 6 WARD 7

INSTRUCTIONS

List professional personnel first and then nonprofessional.

In column under "title" enter title, e.g., Maj., Capt., Lt., Sgt., Pvt., Mr., Mrs., Miss.

Entries for "Duty" and for "Off Duty Status" will be symbolized as follows:

"Duty" symbols
- HN—Head nurse
- ASST. HN—Asst. head nurse
- GEN. DUTY—General duty
- CL. T—Clinical technician
- WM—Ward master

"Off Duty Status" symbols
- DO—Day off
- LV—Leave
- SK—Sick leave
- HT—Holiday time

For use of this form, see AR 40-407; the proponent agency is the Office of The Surgeon General.

Dec/Jan

TITLE	LAST NAME	DUTY	DUTY TIME, CLASS TIME, OR OFF-DUTY STATUS SUN.	MON.	TUE.	WED.	THURS.	FRI	SAT.
			10	11	12	13	14	15	16
MAJ	INOUYE, CHRISTINE	CHN	DO	1	07-19	07-19	DO	1	DO
CPT	FIELDS, DOUGLAS	CSN			CAS	III			
CPT	BRAY, DEBORAH	CSN	1	DO	19-07	19-07	DO	2	2
2Lt	BEQUETTE, BONNIE	CSN	3	3	DO	DO	07-19	33 AVC HT	1
2Lt	SVOBODA, JOHN	CSN	2	2	DO	DO	19-07	3	3
SFC	SHOVERS, CARL 91C	NCOIC	DO		E	VI	7		DO
SGT	VREDENBURGH, EDDIE	91B	DO	DO	1	1	1	1	1
SGT	HOOKER, ROBERT	91B	1	1	1	1	LV	LV	LV
SGT	JAMES, CAROLYN	91B	2	(2)	DO	DO	C.C.	1/2	2
SGT	SMALL, TERLEASHA	91B	DO	DO	1	C.C.	1/2	1	
SPC	MILLER, SCOTT	91A	DO	DO	(2)	(2)	3	3	3
SPC	SALPIETRA	91A	2	2	(2)	(2)	DO	DO	1
PVT	BAMBURG	91A	DO	(2)	(2)	(2)	2	2	DO
MS	JAMES, NATTALEA	LPN/EMT	1	1	DO	DO	2	2	2
MS	WRIGHT, NEVA 1st	LPN/EMT	DO						DO
MS	HOUSTON, CHERYL	LPN	2	DO	DO	1	1	1	1
MS	ABBOT, MAYME	NA	1	(2)	1	DO	2	2	2
MR	RIVERA, RALPH	NA	DO	DO	(2)	2	2	2	2
*	SHIFT LEADER								

SIGNATURE OF HEAD NURSE

WARD E-8

INSTRUCTIONS

List professional personnel first and then nonprofessional.

In column under "title" enter title, e.g., Maj., Capt., Lt., Sgt., Pvt., Mr., Mrs., Miss.

Entries for "Duty" and for "Off Duty Status" will be symbolized as follows:

"Duty" symbols

HN—Head nurse
ASST. HN—Asst. head nurse
GEN. DUTY—General duty
CL. T—Clinical technician
WM—Ward master

"Off Duty Status" symbols

DO—Day off
LV—Leave
SK—Sick leave
HT—Holiday time

Emergency Complaints

1. Acute Chest Pain
2. Respiratory Distress/Acute Asthma
3. Systolic Blood Pressure greater than 180 or less than 90; Diastolic Blood Pressure greater than 180 (if taken at home)
4. Head Trauma with Loss of Consciousness
5. Dislocation of Open Fracture
6. Severe Bleeding from Any Source
7. Burns and Lacerations of Moderate to Severe Nature
8. Eye Injuries of Moderate to Severe Nature
9. Severe Pain from Any Cause
10. Compromising Allergic Reaction
11. Acute Psychosis, Suicidal or Homicidal Reactions
12. Medication or Substance Overdose or Poisoning
13. Recent Seizure Activity where Patient Appears Sleepy
14. Patient with Altered Level of Consciousness from Unknown Reason
15. Vomiting of Blood of Any Significant Amount

FACT SHEET

SUBJECT: Non-Urgent Care Clinic

1. The Non-Urgent Care (NUC) Clinic is scheduled to begin operations on 3 Oct 89. This clinic is established through an agreement under the Military-Civilian Health Services Partnership Program and will be staffed by Sterling Emergency Medicine, Inc. This clinic will operate from 1500 - 2300, Monday - Friday within the area which was previously the CCU. The primary objective of the agreement is to provide alternatives for CHAMPUS eligible patients to receive outpatient, minor acute care other than through the Emergency Room (ER) or through utilization of the more costly traditional CHAMPUS program.

2. The following procedures will apply. Patients presenting to the ER will be logged in by the receptionist, vital signs taken, and normal triage conducted, with appropriate entries made on the SF 558. The ER Shift Leader or designated representative will review the SF 558s to identify minor illness cases in which the patient is a CHAMPUS eligible beneficiary (retirees and dependents of active duty and retirees who are under the age of 65, not including parents or parents-in-law claimed as dependents). SF 558s in which these conditions are met will be presented to the ER physician on duty to verify the medical appropriateness of offering the patient the option to utilize the NUC Clinic. The ER physician will indicate this verification by annotating "To NUC Clinic" and signing the SF 558. The ER Shift Leader or designated representative will then discuss and offer that option to the patient. Patients electing to utilize the NUC Clinic will be provided a records charge out card and instructed to report to the Outpatient Records Section, obtain their medical records, and return to the ER. The patient's time out will also be annotated on the SF 558. The Outpatient Records Section staff will verify that the patient is enrolled in the DEERS system, making an appropriate annotation on the front cover of the medical record to reflect this. In the absence of a medical record, the Outpatient Records staff will make a separate specific notation on the charge out card that the record is currently charged out or that there is not an existing record within this facility, as well as indicating the DEERS eligibility status of the patient. All patients who are not enrolled in DEERS will be so informed, encouraged to correct this through the sponsor's unit personnel office or the AG ID Card Office, and directed to report back to the ER Shift Leader. These patients will then receive necessary care and treatment in the ER. (Note: If a patient presents to the ER with medical records in their possession, ER staff may check the front of the medical record cover for this information and, if the annotation is initialed and less than 90 days old, the patient will not be required to report to the Outpatient Records Section.) Upon obtaining records and returning to the ER, all copies of the SF 558 are attached to the medical record which is then placed in a rack at the ER reception desk. Staff of the NUC Clinic will report to the ER, pick up the medical records and the original copy of the SF 558 (remaining copies will remain in the ER), and escort the patients to the NUC Clinic. Care/treatment provided by the NUC Clinic will be documented on a SF 600, which will be attached and placed in the patients medical record. The NUC Clinic staff will maintain a log in order to track each patient by time in and time out, chief complaint, and disposition. The log utilized for that purpose will be left with the ER Charge Nurse upon closure of the NUC Clinic. Similarly, patient medical records will be left with the ER for pick up by PAD the following morning.

3. Ancillary/Administrative Support.

a. Pathology. Necessary lab work will be accomplished per those Lab procedures which apply to the ER. Refer to the Lab Manual for details. (Note: see p 52 of that manual for prioritization of lab requests.)

b. Pharmacy. Patients will be directed to the Outpatient Pharmacy for fill of prescriptions until 1745 hours. After 1745 hours, a pharmacy cabinet located within the NUC Clinic will be utilized. Authorized medications will be as specified by the Chief, Pharmacy. The ER will be responsible for unlocking the cabinet at 1745 daily, and securing the cabinet at 2300. Cabinet keys will be retained by the ER at all times. Requirements for medications not stocked in the NUC Clinic will be coordinated with the ER or the Department of Nursing Evening/Night Supervisor. (Note: prescriptions should be written by the NUC Clinic physician and left in the pharmacy cabinet to account for medications dispensed.)

c. Radiology. Radiological films which are required will be requested per the same procedures which apply to the ER. Requirements for readings by a Radiologist must be coordinated through the ER physician on duty.

d. The NUC Clinic staff may request administrative support by contacting the Administrative Officer of the Day (AOD) at Ext 3117/3118.

4. Utilization of the NUC Clinic is optional for the CHAMPUS eligible beneficiary. They may decline to use this service and continue to be seen in the ER. If the patient so declines, an appropriate note will be made on the SF 558 and the patient will be seen in the ER.

5. The ER staff is responsible to constantly assess patient medical conditions, flow, and waiting times within the ER to determine whether reassignment of patients awaiting movement to the NUC Clinic is required. If a patient is subsequently redirected to the ER an appropriate note will be made on the SF 558 to explain the circumstances.

CPT Crowell/3512

Date_____ Wkday_____ Entry to ER: Ambulance POV

Patient: Number_____ Age_____ Sex_____ Triage Cat_____

Diagnosis/Complaint_____.

Registration Time: _____
Time Vitals Taken: _____
Triage Time: _____

CONTACT TIMES (inside ER bed/treatmeant area):

Nurse

	Clock Time	(Min/Sec)	Activity
1.	_____	( )	_____
2.	_____	( )	_____
3.	_____	( )	_____
4.	_____	( )	_____
5.	_____	( )	_____
6.	_____	( )	_____

Physician

	Clock Time	(Min/Sec)	Activity
1.	_____	( )	_____
2.	_____	( )	_____
3.	_____	( )	_____
4.	_____	( )	_____
5.	_____	( )	_____
6.	_____	( )	_____

Paraprofessional

	Clock Time	(Min/Sec)	Activity
1.	_____	( )	_____
2.	_____	( )	_____
3.	_____	( )	_____
4.	_____	( )	_____
5.	_____	( )	_____
6.	_____	( )	_____

Consultation

	Clock Time	(Min/Sec)	Activity
1.	_____	( )	_____
2.	_____	( )	_____
3.	_____	( )	_____
4.	_____	( )	_____

Therapeutic Wait

1.	_____	( )	_____
2.	_____	( )	_____
3.	_____	( )	_____

LAB Clock Time XRAY Clock Time Comments

Spec Drawn_____ Xray Ordered_____ _____
Results Back_____ Patient Back_____ _____
Results Back_____ _____

Decision To: Admit_____ Transfer_____ Discharge_____
Patient: Admitted_____ Transferred_____ Discharged_____

Date _____ Entry to ER: Ambulance POV

Patient: Number_____ Age_____ Sex_____ Triage Cat_____

Registration Time: Wait for Registration _____
Registration _____

History Time: Wait for History _____
History Taken _____

Triage Time: Wait for Triage _____
Triage Performed _____

CONTACT TIMES: Inside ER

Nurse		Paraprofessional	
Initial	_____	Initial	_____
Meds given	_____	_____	_____
Procedures	_____	Procedures	_____
Charting	_____	_____	_____
Discharge	_____	_____	_____
Admit Process	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Physician		Theraputic	
Initial Eval	_____	_____	_____
Results Eval	_____	_____	_____
Results Eval	_____	_____	_____
Procedures	_____	_____	_____
Charting	_____	_____	_____
Consulting	_____	_____	_____
_____	_____		
_____	_____		

Lab	Xray	Consultation
Spec Drawn_____	Pt to Xray_____	1st Call_____
or	Results Back_____	Arrival_____
Pt to Lab_____		Admit/Transfer Decision_____
Results Back_____		Additional Tests requested #_____

Date _____ Entry to ER: Ambulance POV

Patient: Number_____ Age_____ Sex_____ Triage Cat_____

Registration Time: _____

Time Vitals Taken: _____

Triage Time: _____

CONTACT TIMES: Inside ER

Nurse Time		Paraprofessional Time	
Initial (call)	_____	Initial (call)	_____
Meds given	_____	_____	_____
Procedures	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Charting	_____	_____	_____
Discharge	_____	_____	_____
Admit Process	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Physician Contact		Therapeutic Time	
Initial Eval	_____	_____	_____
Result Eval (1)	_____	_____	_____
Results Eval(x)	_____	_____	_____
Eval/Procedures	_____		

Decision To: Admit_____ Transfer_____ Discharge_____

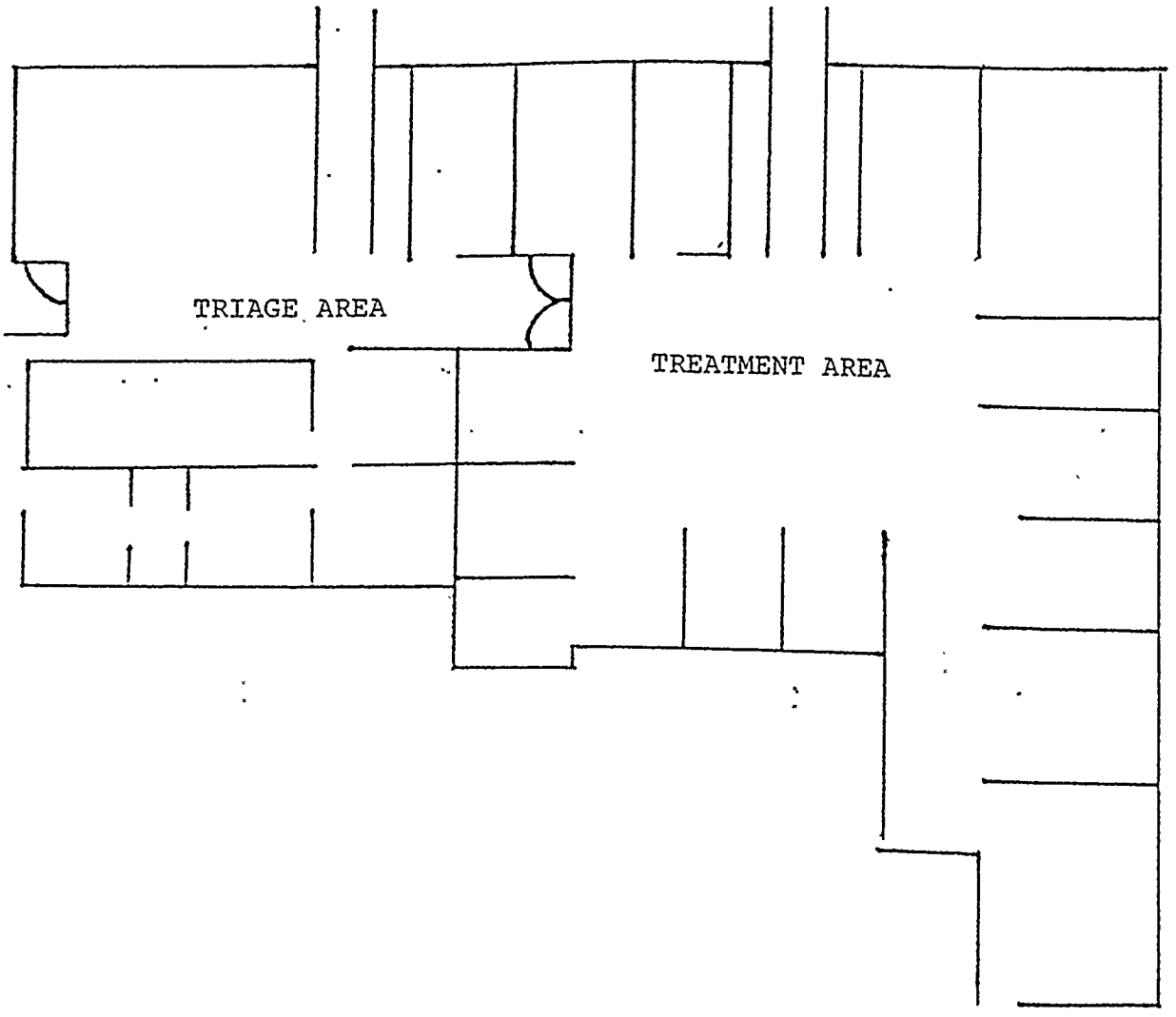
Charting _____

_____ _____

_____ _____

Lab	Xray	Consultation
Spec Drawn_____	Xray Ordered_____	1st Call_____
Results Back_____	Results Back_____	Arrival_____
2nd Lab_____	2nd Xray_____	Eval_____
Results Back_____	Results Back_____	

Patient Leaves the ER_____


TRIAGE AREA
TREATMENT AREA

AVERAGE ARRIVAL RATES PER HOUR
ALL Patients that Presented to ER

DEC	H10-11	H11-12	H12-13	H13-14	H14-15	H15-16	H16-17	H17-18	H18-19	H19-20	H20-21	H21-22	H22-23	H15-23 TOTAL
11	2	7	4	7	13	17	7	7	9	6	9	4	3	62
12	9	5	7	3	5	11	8	8	8	4	10	6	1	56
13	2	3	3	5	3	5	10	6	10	6	7	3	8	55
14	3	3	2	3	10	8	10	5	11	9	11	1	3	58
19	3	4	4	5	10	3	6	9	7	6	3	10	3	47
20	8	6	8	7	6	4	4	6	10	7	4	4	3	42
21	3	1	5	4	13	4	6	4	4	7	5	5	5	40
Ave Pts per Hr	4.29	4.14	4.71	4.86	8.57	7.43	7.29	6.43	8.43	6.43	7.00	4.71	3.71	360

AVERAGE ARRIVAL RATES PER HOUR
ER Patients Treated (i.e. Those Presented Less Refferals)

DEC	H10-11	H11-12	H12-13	H13-14	H14-15	H15-16	H16-17	H17-18	H18-19	H19-20	H20-21	H21-22	H22-23	H15-23 TOTAL
11	2	7	4	6	6	9	5	4	6	6	9	4	3	46
12	7	2	7	2	3	5	6	3	3	4	6	5	1	33
13	2	3	3	5	2	4	6	4	6	3	4	2	5	34
14	1	3	1	1	8	4	7	3	10	7	7	1	3	42
19	3	4	4	5	5	3	3	5	2	5	1	8	3	30
20	8	6	6	3	3	1	2	4	4	5	2	3	3	24
21	2	1	5	4	6	1	3	3	2	3	4	3	4	23
Ave Pts per Hr	3.57	3.71	4.29	3.71	4.71	3.86	4.57	3.71	4.71	4.71	4.71	3.71	3.14	232
INTER-ARRIVAL Rate(min)	16.80	16.15	14.00	16.15	12.73	15.56	13.13	16.15	12.73	12.73	12.73	16.15	19.09	

INCREASED AVERAGE ARRIVAL RATES PER HOUR OF ER PATIENTS TREATED
Increments 20%, 30%, 40%

	H10-11	H11-12	H12-13	H13-14	H14-15	H15-16	H16-17	H17-18	H18-19	H19-20	H20-21	H21-22	H22-23
Ave pts per hr	3.57	3.71	4.29	3.71	4.71	3.86	4.57	3.71	4.71	4.71	4.71	3.71	3.14
INC 20%	0.71	0.74	0.86	0.74	0.94	0.77	0.91	0.74	0.94	0.94	0.94	0.74	0.63
Total	4.28	4.45	5.15	4.45	5.65	4.63	5.48	4.45	5.65	5.65	5.65	4.45	3.77
INTER-ARRIVAL Rate(min)	14.01	13.48	11.66	13.48	10.62	12.95	10.94	13.48	10.62	10.62	10.62	13.48	15.92
INC 30%	1.07	1.11	1.29	1.11	1.41	1.16	1.37	1.11	1.41	1.41	1.41	1.11	0.94
Total	4.64	4.82	5.58	4.82	6.12	5.02	5.94	4.82	6.12	6.12	6.12	4.82	4.08
INTER ARRIVAL Rate(min)	12.93	12.44	10.76	12.44	9.80	11.96	10.10	12.44	9.80	9.80	9.80	12.44	14.70
INC 40%	1.43	1.48	1.72	1.48	1.88	1.54	1.83	1.48	1.88	1.88	1.88	1.48	1.26
Total	5.00	5.19	6.01	5.19	6.59	5.40	6.40	5.19	6.59	6.59	6.59	5.19	4.40
INTER ARRIVAL Rate(min)	12.00	11.55	9.99	11.55	9.10	11.10	9.38	11.55	9.10	9.10	9.10	11.55	13.65

DEPARTMENT OF THE ARMY
US ARMY MEDICAL DEPARTMENT ACTIVITY
FORT POLK, LOUISIANA 71459-6000

REPLY TO
ATTENTION OF:

HSXV-DP(15-1a) 6 September 1989

MEMORANDUM FOR Chairman Quality Assurance Committee, U.S. Army Medical Department Activity, Fort Polk, Louisiana 71459-6000

SUBJECT: Department of Pathology Quality Assurance Committee Minutes.

1. CALL TO ORDER: In accordance with MEDDAC Regulation 15-1, the Quality Assurance Meeting was called to order at 0810 hours, in the Blood Bank Recovery Area, on 6 September 1989 by MAJ Thomas Westermeier, MC, Chairman.

2. ATTENDANCE:

a. Members and representatives present:

MAJ Thomas Westermeier, MC, Chief, Department of Pathology, Chairman
CPT Kenneth Davis, MS, Laboratory Manager
Mr James D. Smith, DAC, Supervisor Chemistry Section
Ms Vernell Heard, DAC, Supervisor Blood bank/Donor Center
Ms Zenaida Malaggun representing
Ms Valerie Olson, DAC, Supervisor Microbiology Section
Ms Delisa Chance, DAC, Section Leader, Hematology Section
Ms Ellen LaFave, Histology Technician

b. Members absent:

Representative, Department of Surgery
Representative, Department of Family Practice

c. Others present:

Ms Beverly Thetford, DAC, Secretary, Department of Pathology

3. REPORTS MISSING: All reports were submitted.

4. OLD BUSINESS.

a. The Quality Assurance minutes of 14 July 1989 were reviewed and approved with the following change.
page 3,d3, reads " the survey had been received two days prior--"
should read "the survey had been received five days prior—"

b. Review of actions pending.

MAJ Westermeier stated that the two surgical cases reported to the DOS/T&T Committee were discussed. One was a clerical error with the wrong history being given. The other was an adenocarcinoid of the appendix which was discovered before it became aggressive. There was no compromise to patient care, no further action is needed, patient will be followed by Department of Surgery.

c. Review of Hospital QA and Executive Committee Minutes.

The Hospital QA minutes were reviewed. No actions are necessary.

5. NEW BUSINESS:

Patient care assessment.

a. Quality Control

CAP matrix indicates that one CAP survey did not meet established criteria. (encl # 1).

PROBLEM: Chemistry survey UB did not meet established criteria.
FINDINGS: The problem was with sodium results. Theses are normally done on the Nova however, the Nova was down so test were performed on the Ektachem. Required dilutions were made but results were not good.
ACTIONS TAKEN/FOLLOW UP: The Ektachem will no longer be used for urine chemistries.

b. Quality Assurance

1) Anatomic Pathology Matrix was in compliance with established criteria for the month of August however, there were two specimens submitted to Anatomic Pathology that did not meet SOP.

PROBLEM: Specimen was submitted in saline and not formalin.
ACTIONS TAKEN AND FOLLOW UP: This will be submitted to the T&T/DOS Committee for action and follow up.

PROBLEM: This was a clerical error on the SF 515 in which the specimen was identified as left on specimen received, right on operative findings, then signed out as left.
ACTIONS TAKEN AND FOLLOW UP: There was no compromise to patient care, however, this case will be reported at the T&T/DOS Committee meeting.

c. Utilization review:

1) Blood Bank Matrix does meet established criteria for the month of August (encl # 3).

PROBLEM: Item # 1 "Single Unit Transfusions" indicates there were two single unit transfusions for the month of August.
FINDINGS: These were pediatric cases therefore appropriate.
ACTIONS TAKEN/FOLLOW UP: No action or follow up is necessary at this time.

HSXV-DP
SUBJECT: Department of Pathology Quality Assurance Committee Meeting

PROBLEM: Item # 3 indicates no shortage of donations, however, LOI has now changed and we should have received 346 units for this time frame.
FINDINGS: Matrix has not been changed. We need to meet with Division Surgeon's office again to establish requirements.
ACTION TAKEN/FOLLOW UP: Matrix will be changed to indicate new requirements as soon as these are established.

PROBLEM: Item # 8 indicates there was one incident of wasteage of blood products.
FINDINGS: Fresh frozen plasma leaked during thawing (the bag had been torn or cut).
ACTIONS TAKEN/FOLLOW UP: No action or follow is necessary at this time.

3) Turn-Around-Time for Stats and Routine Lab Request Matrix does meet established criteria for the month of August (encl # 4).

4) PR teams report that visits were made to Quad 2 and ICU during August.

d. Risk management.

There were no possible risk management cases reported for the month of August. MAJ Westermeier stated that physicians have approached him with complaints but since none were reported as unusual occurrences, DA Form 4106 (indicating names, times and dates), we cannot review the problems appropriately. Our goal is still to have no inappropriate lab results leave the department.

6. ADMINISTRATIVE ISSUES:

a. The laboratory gained one tech and our new NCOIC arrived this month, however two techs were lost and one civilian supervisor will be leaving on 13 September. We need to encourage more team work to partially compensate for shortages.

b. There have been complaints that personnel at the front desk are not releasing/finding results and calls are being transferred back to sections. This will be investigated/monitored.

c. The phlebotomy room personnel is not writing "baseline" on request forms for glucose tolerance test when the patient is not fasting.

d. Section supervisors must train personnel to perform quality control and preventive maintenance in their absences.

e. All personnel must be reminded that the original (top copy) of the laboratory request form always goes to the patient's record. Some of the hematology forms are misprinted and indicate physicians copy, new slips will be ordered and corrections made.

HSXV-DP
SUBJECT: Department of Pathology Quality Assurance Committee Meeting.

g. We need to establish new QA monitors. The following suggestions were made and will be presented at the next meeting for approval/disapproval.

1) Phlebotomy room - PKU's and thyroid studies on newborns.
number of patients passing out

2) Critical values reporting (are tech's complying by values set?)

3) Reports of results not received.

4) Ambient temperatures of sections, Monday through Friday, also log down times of analyzers caused by heat.

c. SOP's revised and/or reviewed in July

Blood Bank - 2

7. ACTIONS PENDING: There were not actions to be reviewed in the October meeting.

Review of QA problem Log.

10-84 Inadequate air conditioning for main lab and Blood Bank/Donor Center.
ACTION TAKEN: Request submitted for corrective actions. This problem has been reviewed and there are no funds available at this time. This problem will be reviewed quarterly.

11-86 CAP team felt that more doors are needed as fire exits (Micro).
ACTIONS TAKEN: Request submitted for corrective actions. This problem has been prioritized # 1 in the hospital priorities. This problem will be reviewed quarterly.

8. The meeting was adjourned at 0915 hours, 6 September 1989. The next meeting is scheduled for 1300 hours 5 October 1989.

THOMAS G. WESTERMEIER
MAJ, MC
Chairman

Encls
1. CAP surveys matrix
2. Anatomic Pathology QA Matrix
3. Blood Bank Utilization Review Matrix
4. Turn-Around-Time Matrix

CF Ms Johnson, DCCS Office (16)
Ms Thetford, Pathology (2)
Members - 1 each

BAYNE-JONES ARMY COMMUNITY HOSPITAL
DEPARTMENT OF PATHOLOGY
FORT POLK LA 71459-6000

QUALITY ASSURANCE
TURN AROUND TIMES FOR STATS AND ROUTINE LAB REQUESTS

CHEMISTRY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
STAT				100%	91%	98%	100%	100%				
ROUTINE					100%	100%	100%	100%				
PRE-OP	95%	100%	100%									

$\bar{X}$ 97.8

HEMATOLOGY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
STAT				98%	100%	98%	98%	98%				
ROUTINE					98%	100%	100%	96%				
PRE-OP	99%	100%	98%	100%								

98.4

BLOOD BANK

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
STAT				N/A	100%	100%	100%	100%				
ROUTINE					100%	100%	100%	100%				
PRE-OP	100%	100%	100%									

100

MICROBIOLOGY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
STAT					100%	100%	98%	100%				
ROUTINE					100%	100%	100%	98%				
PRE-OP	100%	100%	100%	100%								

99.5

$\bar{\bar{X}} = 98.9$

1. ALL TURN-AROUND TIMES SHOULD BE 95% OR GREATER FOR GOOOD OR ACCEPTABLE PERFORMANCE.
2. 100 LAB SLIPS ARE TO BE SAMPLED. TAT WILL BE DETERMINED FOR THE FOLLOWING AREAS AND FOR THE DESIGNATED TIME PERIOD:
    1. ER MAY- AUG
    2. 6 EAST SEPT-DEC
    3. PRE-OP JAN-APR
    4. FAMILY PRACTICE MAY-AUG
3. STAT TAT SHOULD BE WITHIN ONE HOUR.
4. ROUTINE REQUESTS SHOULD BE WITHIN 24 HOURS TAT.

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 DEC 1989 - 31 DEC 1989
SUMMARY OF PTS SEEN (DISP HOME OR DUTY), NON - FRI ONLY, 1500 - 2300 ARRTIME
ELAPSED TIME BETWEEN ARRIVAL/SEEN - MINUTES)

PATIENT CATEGORY E : 4
TOTAL PATIENT WAIT TIME (ARR > SEEN): 124
AVERAGE WAIT (ARR >SEEN) THIS PT CAT: 31

PATIENT CATEGORY N : 248
TOTAL PATIENT WAIT TIME (ARR > SEEN): 11617
AVERAGE WAIT (ARR >SEEN) THIS PT CAT: 46.84274

PATIENT CATEGORY U : 43
TOTAL PATIENT WAIT TIME (ARR > SEEN): 1524
AVERAGE WAIT (ARR >SEEN) THIS PT CAT: 35.44186

PATIENT CATEGORY : 352
TOTAL PATIENT WAIT TIME (ARR > SEEN): 14779
AVERAGE WAIT (ARR >SEEN) THIS PT CAT: 41.98579

BAYNE-JONES ACH

PERSONAL DATA - PRIVACY ACT OF 1974

EMERGENCY ROOM - PERIOD 01 MAR 1990 - 31 MAR 1990
SUMMARY OF PTS SEEN (DISP HOME OR DUTY), MON - FRI ONLY, 1500 - 2300 ARR(TIME
ELAPSED TIME BETWEEN ARRIVAL/SEEN - MINUTES)

PATIENT CATEGORY E : 7
TOTAL PATIENT WAIT TIME (ARR > SEEN): 342
AVERAGE WAIT (ARR >SEEN) THIS PT CAT: 48.85714

PATIENT CATEGORY N : 745
TOTAL PATIENT WAIT TIME (ARR > SEEN): 37533
AVERAGE WAIT (ARR >SEEN) THIS PT CAT: 50.38255

PATIENT CATEGORY U : 97
TOTAL PATIENT WAIT TIME (ARR > SEEN): 4609
AVERAGE WAIT (ARR >SEEN) THIS PT CAT: 47.51546

PATIENT CATEGORY : 23
TOTAL PATIENT WAIT TIME (ARR > SEEN): 769
AVERAGE WAIT (ARR >SEEN) THIS PT CAT: 33.39130

Baseline
Run 4.04T

```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980;
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.9;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;

COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
              9,NO OF CONSULT PT,,YES:
```

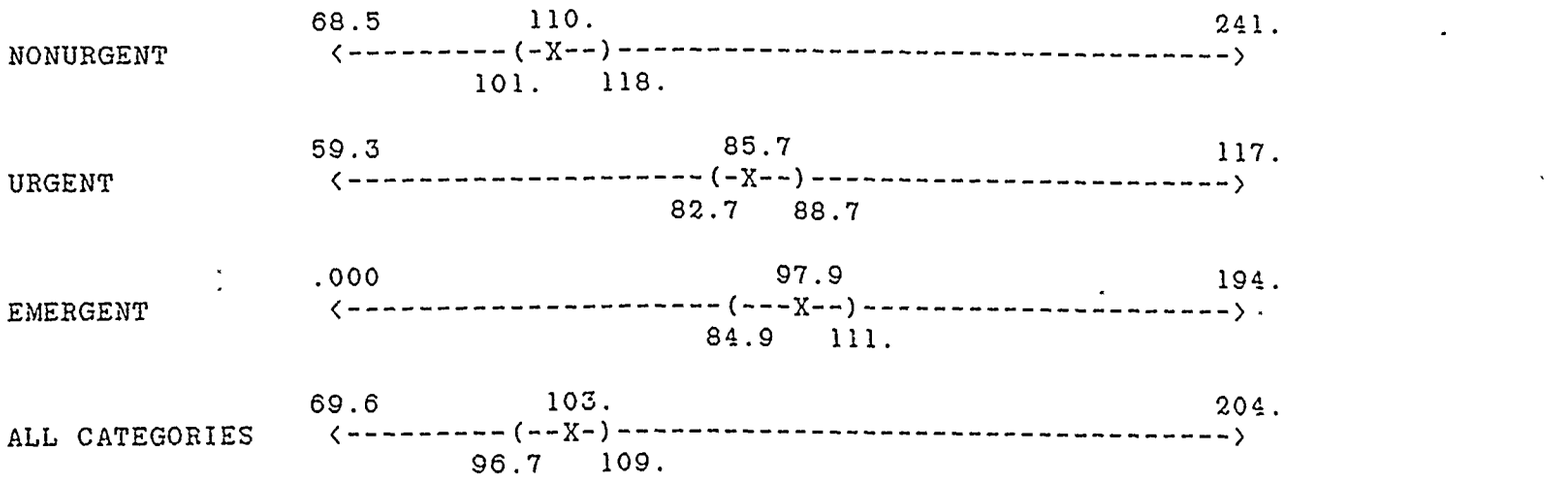
```
                10,TOTAL ADMISSIONS,1,ED;

TPUT        :1,TAVG(1),1,TIS PT CAT 1:
             2,TAVG(2),2,TIS PT CAT 2:
             3,TAVG(3),3,TIS PT CAT 3:
             4,TAVG(4),4,TIS ALL PATIENTS:
             5,TAVG(5),5,MTBED AVE WAIT:
             6,TAVG(6),6,WAIT FOR MTDOC:
             7,TAVG(7),7,REGBED AVE WAIT:
             8,TAVG(8),8,WAIT FOR RGBDDOC:
             9,TAVG(9),9,WAIT FOR DOC2:
             10,DAVG(1),10,NURSE UTIL:
             11,DAVG(2),11,DOC UTIL:
             12,DAVG(3),12,PARA UTIL:
             13,DAVG(4),13,MTBED UTIL:
             14,DAVG(5),14,REGBED UTIL:
             15,DAVG(6),15,MTBED QUE;    !UTPUT       :16,DAVG(7),16,MTD

PLICATE    ,75,0.00,780,YES,YES,300;

D;
```

Baseline
OUTPUT.70

INTERVALS: AVG VISIT TIME

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	110.	37.5	8.63	68.5	241.	75
URGENT	85.7	12.9	2.97	59.3	117.	75
EMERGENT	97.9	56.5	13.0	.000	194.	75
ALL CATEGORIES	103.	26.2	6.04	69.6	204.	75

INTERVALS : AVG VISIT TIME

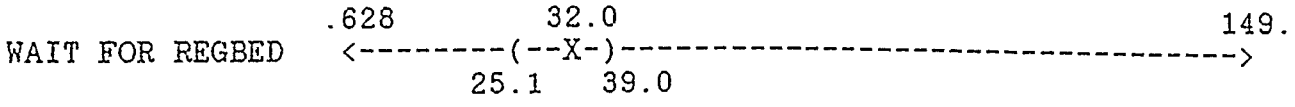


< = MINIMUM	(= LOWER 95% CL	X = AVERAGE	) = UPPER 95% CL	> = MAXIMUM

INTERVALS: WAIT FOR RESOURCES

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	32.0	30.2	6.96	.628	149.	75

INTERVALS : WAIT FOR RESOURCES



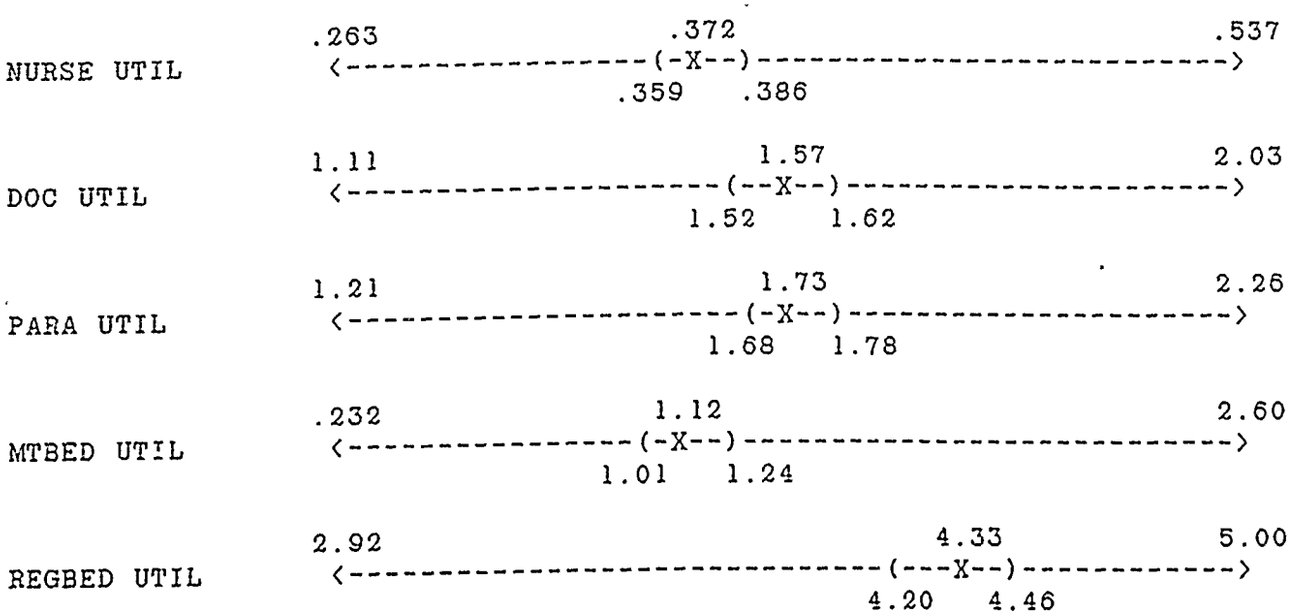
! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

Baseline
output.72

INTERVALS: RESOURCE UTILIZATION

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.372	5.958E-02	1.371E-02	.263	.537	75
DOC UTIL	1.57	.223	5.141E-02	1.11	2.03	75
PARA UTIL	1.73	.223	5.140E-02	1.21	2.26	75
MTBED UTIL	1.12	.506	.116	.232	2.60	75
REGBED UTIL	4.33	.572	.132	2.92	5.00	75

INTERVALS : RESOURCE UTILIZATION



; < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM ;

INTERVALS: PATIENTS IN MTBED QU

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER

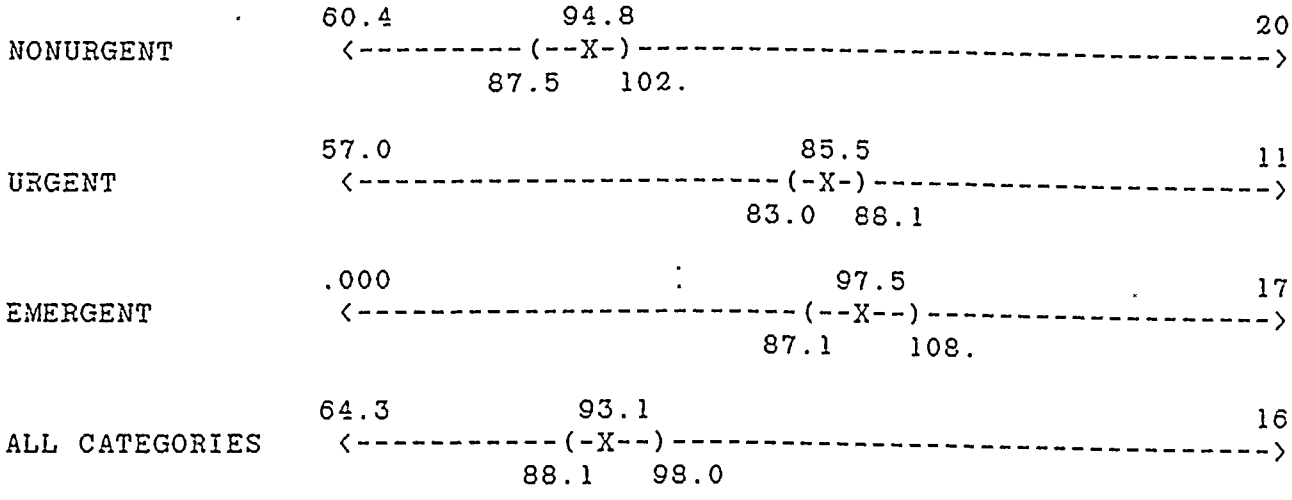
```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980; (+1 DOC)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.63,1,.951,2,1,3:          !DP>
             2,.31,49,.842,30,1,99:        !DP>
             3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,3*360,4*360,3*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
```

Bazelais
P(1) Doc
Output 62.out

INTERVALS: AVG VISIT TIME (+1 DoC)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	94.8	31.5	7.26	60.4	201.	75
URGENT	85.5	11.2	2.57	57.0	113.	75
EMERGENT	97.5	45.1	10.4	.000	177.	75
ALL CATEGORIES	93.1	21.5	4.94	64.3	166.	75

INTERVALS : AVG VISIT TIME

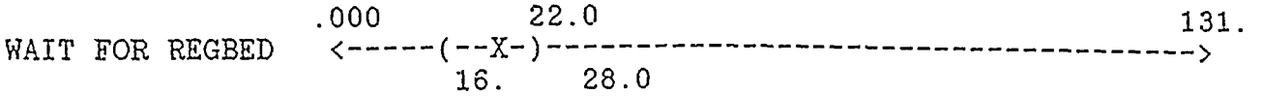


! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

INTERVALS: WAIT FOR RESOURCES (+1 DOC)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	22.0	25.9	5.96	.000	139.	75

INTERVALS : WAIT FOR RESOURCES



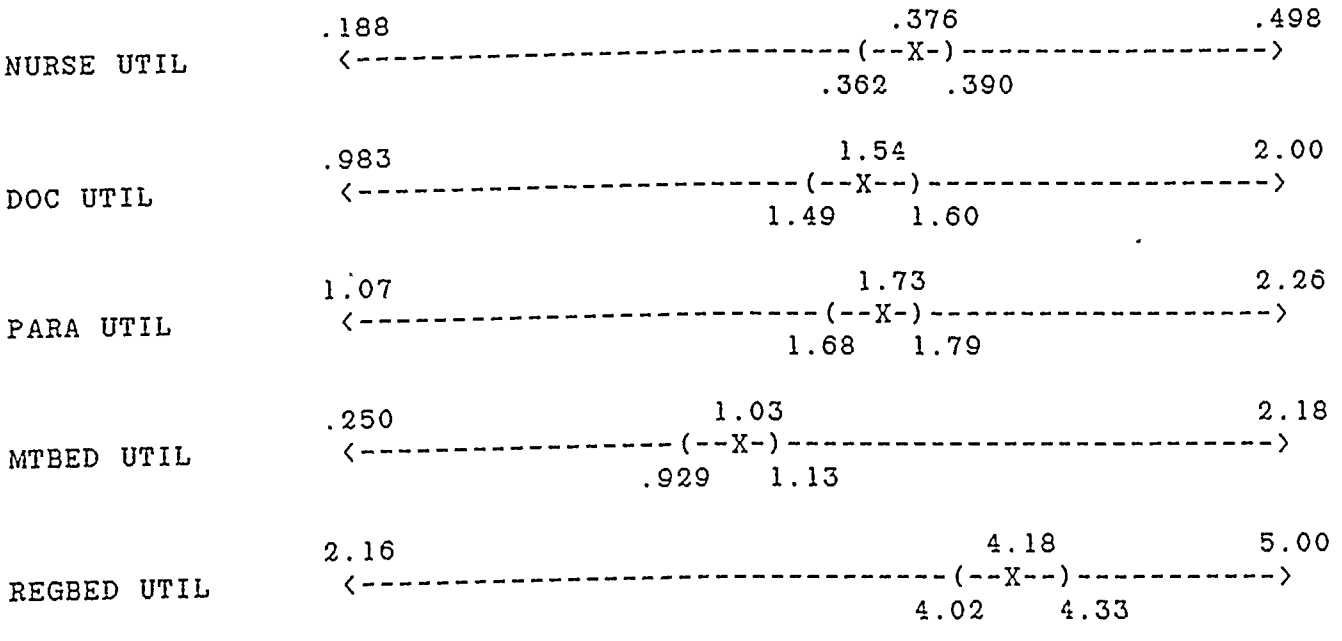
! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

Baseline
T(1)DOC
output.64

INTERVALS: RESOURCE UTILIZATION (+1DOC)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.376	6.149E-02	1.415E-02	.188	.498	75
DOC UTIL	1.54	.233	5.365E-02	.983	2.00	75
PARA UTIL	1.73	.246	5.660E-02	1.07	2.26	75
MTBED UTIL	1.03	.438	.101	.250	2.18	75
REGBED UTIL	4.18	.663	.153	2.16	5.00	75

INTERVALS : RESOURCE UTILIZATION



! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

Baseline
↑ 2 DOC
Run 9.out

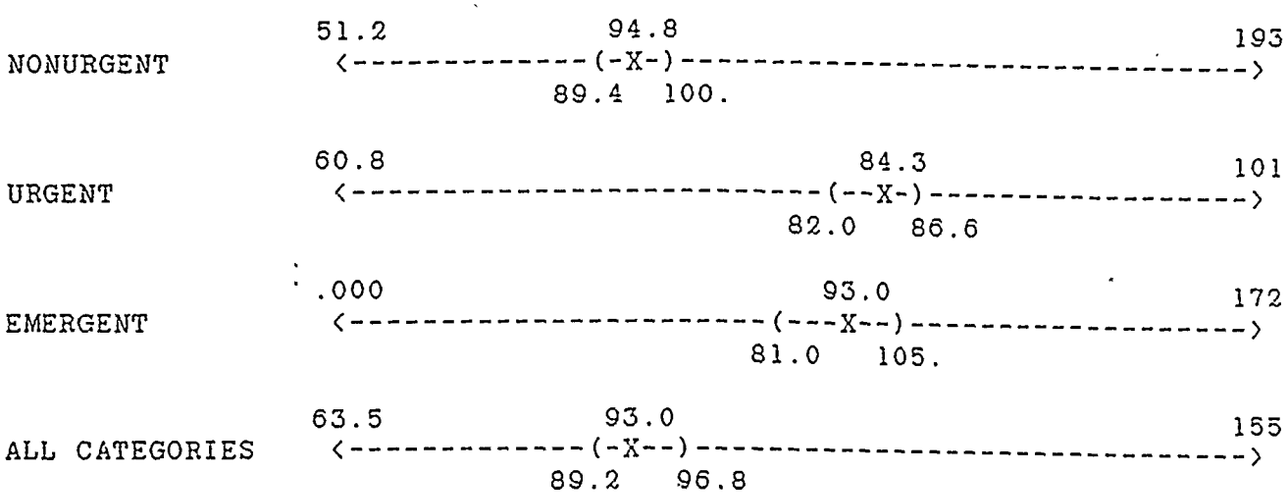
```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980; (+2 DOC)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:        !DP>
              2,.316,49,.842,30,1,99:     !DP>
              3,16.80;                    !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,4*360,5*360,4*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
```

Baseline
↑ 200
output.65

INTERVALS: AVG VISIT TIME (+200)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	94.8	23.5	5.40	51.2	193.	75
URGENT	84.3	9.82	2.26	60.8	101.	75
EMERGENT	93.0	51.9	11.9	.000	172.	75
ALL CATEGORIES	93.0	16.5	3.80	63.5	155.	75

INTERVALS : AVG VISIT TIME

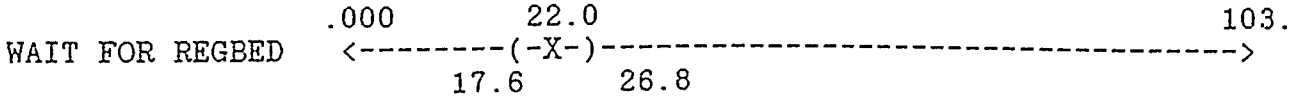


! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

INTERVALS: WAIT FOR RESOURCES (+2 Doc)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	22.2	20.0	4.61	.000	103.	75

INTERVALS : WAIT FOR RESOURCES



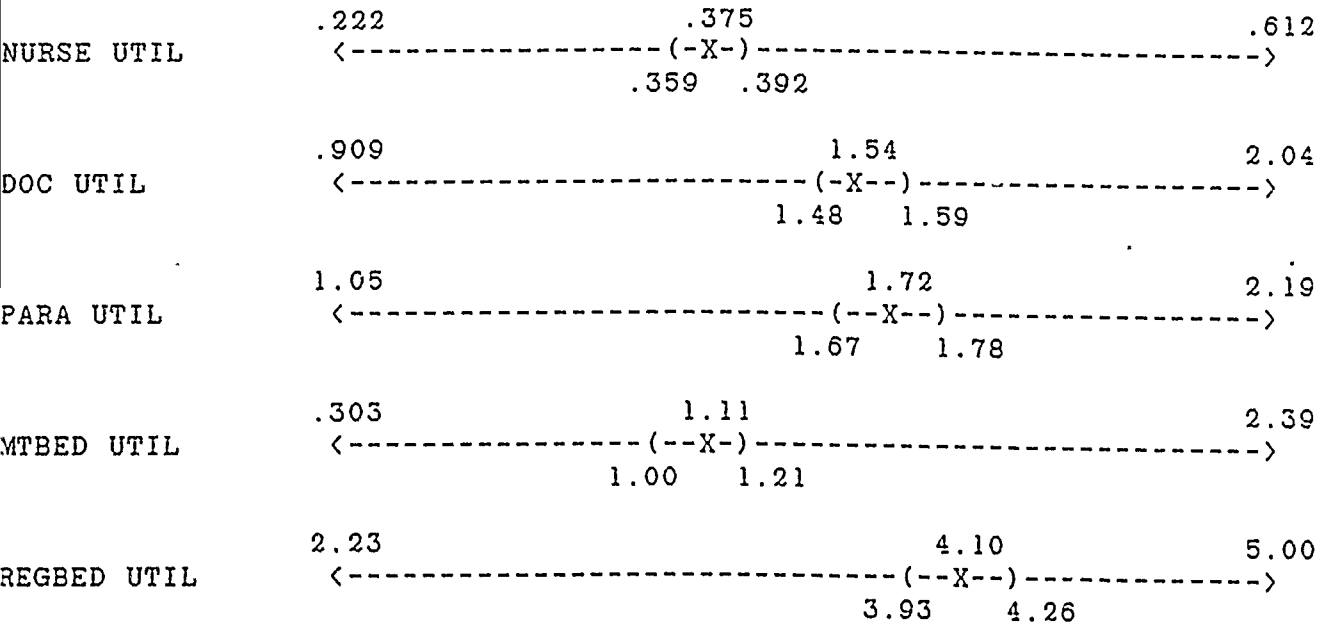
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

Baseline
↑ 200C
Output.67

INTERVALS: RESOURCE UTILIZATION (+200C)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.375	7.024E-02	1.616E-02	.222	.612	75
DOC UTIL	1.54	.241	5.550E-02	.909	2.04	75
PARA UTIL	1.72	.259	5.957E-02	1.05	2.19	75
MTBED UTIL	1.11	.442	.102	.303	2.39	75
REGBED UTIL	4.10	.711	.164	2.23	5.00	75

INTERVALS : RESOURCE UTILIZATION



! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

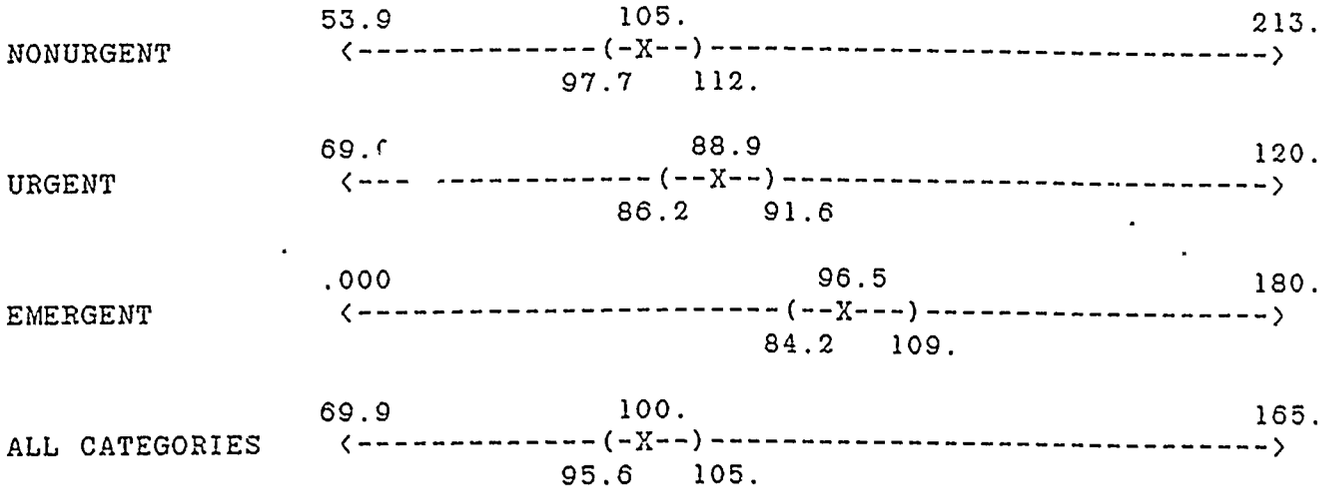
```
EGIN;

ROJECT      ,XXXXX,XXXXX,4/23/1980; (+1 NURSE)

ISCRETE     ,300,30,30,10;

ARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
             2,.316,49,.842,30,1,99:       !DP>
             3,16.80;                      !EX>

ABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
             16.15,12.73,12.73,12.73,16.15,19.09;

ANKINGS     :1-30,HVF(1);

ESOURCES    :1,DOC,SCHED(1):
             2,NURSE,2:
             3,PARA,7:
             4,MTBED,4:
             5,REGBED,5;

CHEDULES    :1,2*360,3*360,2*60;

STAT        :1,NR(2),NURSE UTIL:
             2,NR(1),DOC UTIL:
             3,NR(3),PARA UTIL:
             4,NR(4),MTBED UTIL:
             5,NR(5),REGBED UTIL:
             6,NQ(1),NO IN MTBED QUE:
             7,NQ(2),NO IN MTDOC QUE:
             8,NQ(3),NO IN REGBED QUE:
             9,NQ(4),NO IN REGDOC QUE:
             10,NQ(5),NO IN DOC2 QUE:
             11,NQ(6),NO IN DOCNU1 QUE:
             12,NQ(7),NO IN DOCNU2 QUE:
             13,NQ(8),NO IN DNP1 QUE:
             14,NQ(9),NO IN DNP2 QUE:
             15,NQ(10),NO IN DNP3 QUE:
             16,NQ(11),NO IN DOCPA1 QUE:
             17,NQ(12),NO IN DOCPA2 QUE:
             18,NQ(13),NO IN NUPA1 QUE:
             19,NQ(14),NO IN NUPA2 QUE:
             20,NQ(15),NO IN NADMIT QUE:
             21,NQ(16),NO IN PADMIT QUE;

ALLIES      :1,AVE TIS CAT 1:
             2,AVE TIS CAT 2:
             3,AVE TIS CAT 3:
             4,AVE TIS ALL CAT:
             5,MTBED AVE WAIT:
             6,MTDOC AVE WAIT:
             7,REGBED AVE WAIT:
             8,REGDOC AVE WAIT:
             9,DOC2 AVE WAIT;

OUNTERS     :1,PATIENT TYPE 1,,YES:
             2,PATIENT TYPE 2,,YES:
             3,PATIENT TYPE 3,,YES:
             4,TOTAL PATIENTS,,YES:
             5,MTBED PATIENTS,,YES:
             6,REGBED PATIENTS,,YES:
             7,NO OF DX PATIENT,,YES:
             8,NO OF RX PATIENT,,YES:
```

Simulate
1 Nurse
output, 2

INTERVALS: AVG VISIT TIME (+1 NURSE)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	105.	30.5	7.03	53.9	213.	75
URGENT	88.9	11.8	2.71	69.0	120.	75
EMERGENT	96.5	53.4	12.3	.000	180.	75
ALL CATEGORIES	100.	20.0	4.59	69.9	165.	75

INTERVALS : AVG VISIT TIME

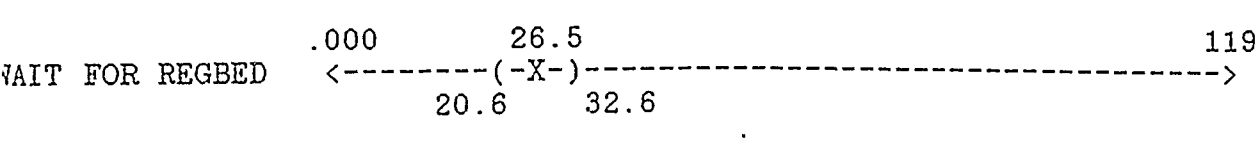


! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

INTERVALS: WAIT FOR RESOURCES (+1 NURSE)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	26.5	25.7	5.91	.000	119.	75

INTERVALS : WAIT FOR RESOURCES

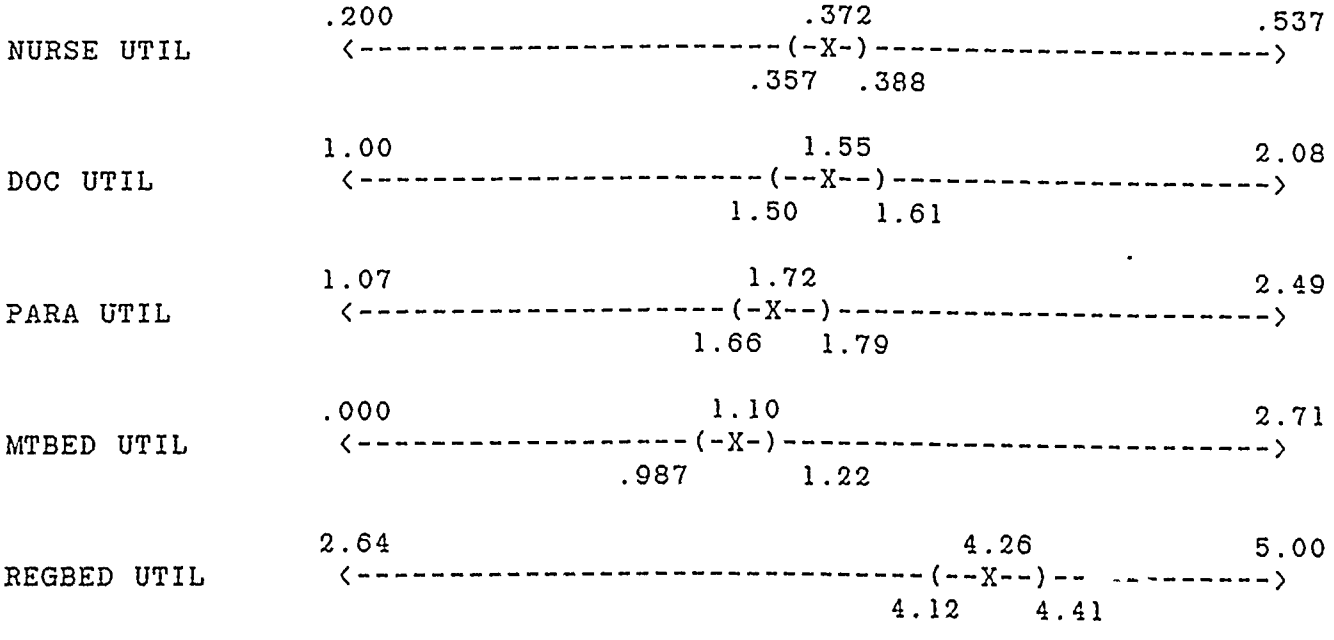


< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

INTERVALS: RESOURCE UTILIZATION (+1 NURSE)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.372	6.582E-02	1.514E-02	.200	.537	75
DOC UTIL	1.55	.236	5.439E-02	1.00	2.08	75
PARA UTIL	1.72	.281	6.474E-02	1.07	2.49	75
MTBED UTIL	1.10	.500	.115	.000	2.71	75
REGBED UTIL	4.26	.626	.144	2.64	5.00	75

INTERVALS : RESOURCE UTILIZATION



! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

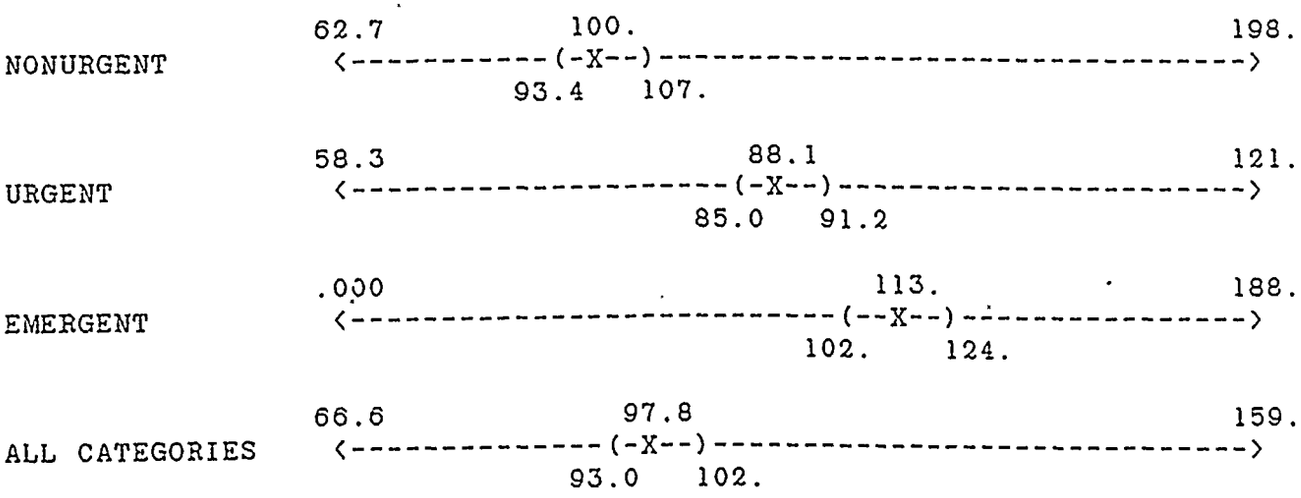
Baseline
↑ 2 Nurses
Run 7.04

```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980;(+2 NURSES)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,3:
              3,PARA,7:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
              9,NO OF CONSULT PT.,YES:
```

INTERVALS: AVE VISIT TIME (42 NURSES)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	100.	29.5	6.78	62.7	198.	75
URGENT	88.1	13.3	3.06	58.3	121.	75
EMERGENT	113.	47.7	11.0	.000	188.	75
ALL CATEGORIES	97.8	20.6	4.73	66.6	159.	75

INTERVALS : AVE VISIT TIME

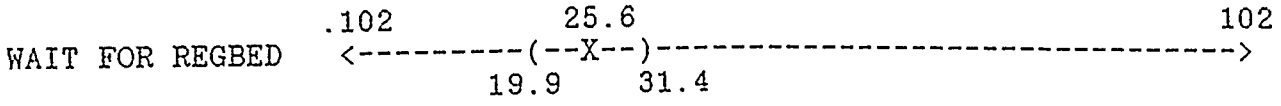


! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

INTERVALS: WAIT FOR RESOURCES (+2 NURSES)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	25.6	25.1	5.78	.102	102	75

INTERVALS : WAIT FOR RESOURCES



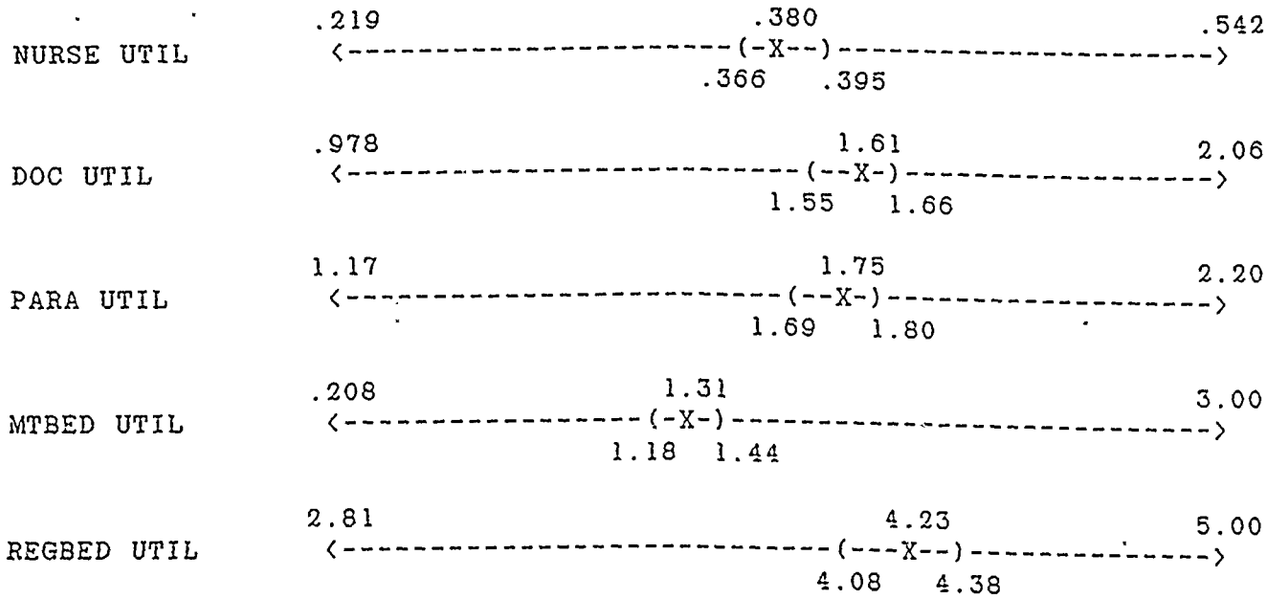
¦ < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM ¦

INTERVALS: RESOURCE UTILIZATION

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.380	6.325E-02	1.455E-02	.219	.542	75
DOC UTIL	1.61	.253	5.828E-02	.978	2.06	75
PARA UTIL	1.75	.237	5.442E-02	1.17	2.20	75
MTBED UTIL	1.31	.559	.129	.208	3.00	75
REGBED UTIL	4.23	.649	.149	2.81	5.00	75

Same run
↑ 2 Nurses
output. 6!

INTERVALS : RESOURCE UTILIZATION (#2 NURSES)



! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

Base line
T1 Para
Run 14.out

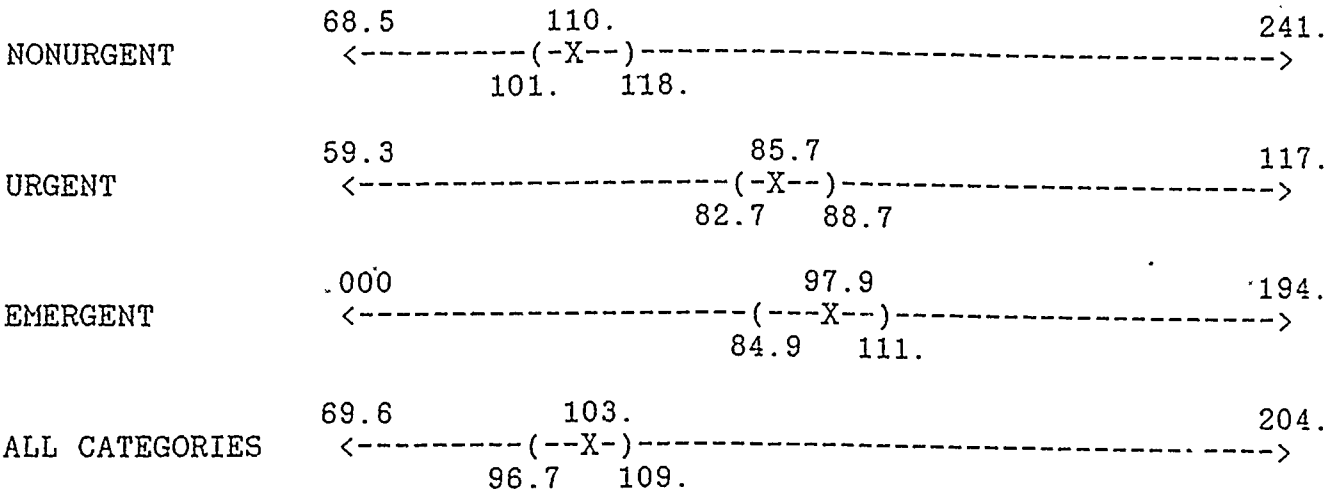
```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980; (+1 PARA)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:        !DP>
              2,.316,49,.842,30,1,99:     !DP>
              3,16.80;                    !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,8:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
```

Exam
Tips
output.39

INTERVALS: AVE VISIT TIME (+1 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	110.	37.5	8.63	68.5	241.	75
URGENT	85.7	12.9	2.97	59.3	117.	75
EMERGENT	97.9	56.5	13.0	.000	194.	75
ALL CATEGORIES	103.	26.2	6.04	69.6	204.	75

INTERVALS : AVE VISIT TIME

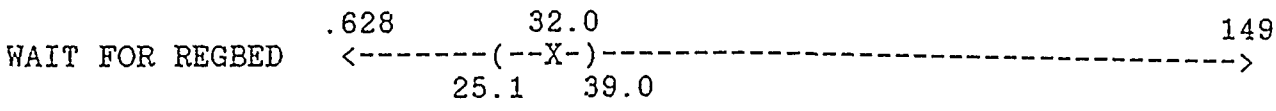


< = MINIMUM	(= LOWER 95% CL	X = AVERAGE	) = UPPER 95% CL	> = MAXIMUM

INTERVALS: WAIT FOR RESOURCES (+1 PAGA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	32.0	30.2	6.96	.628	149.	75

INTERVALS : WAIT FOR RESOURCES



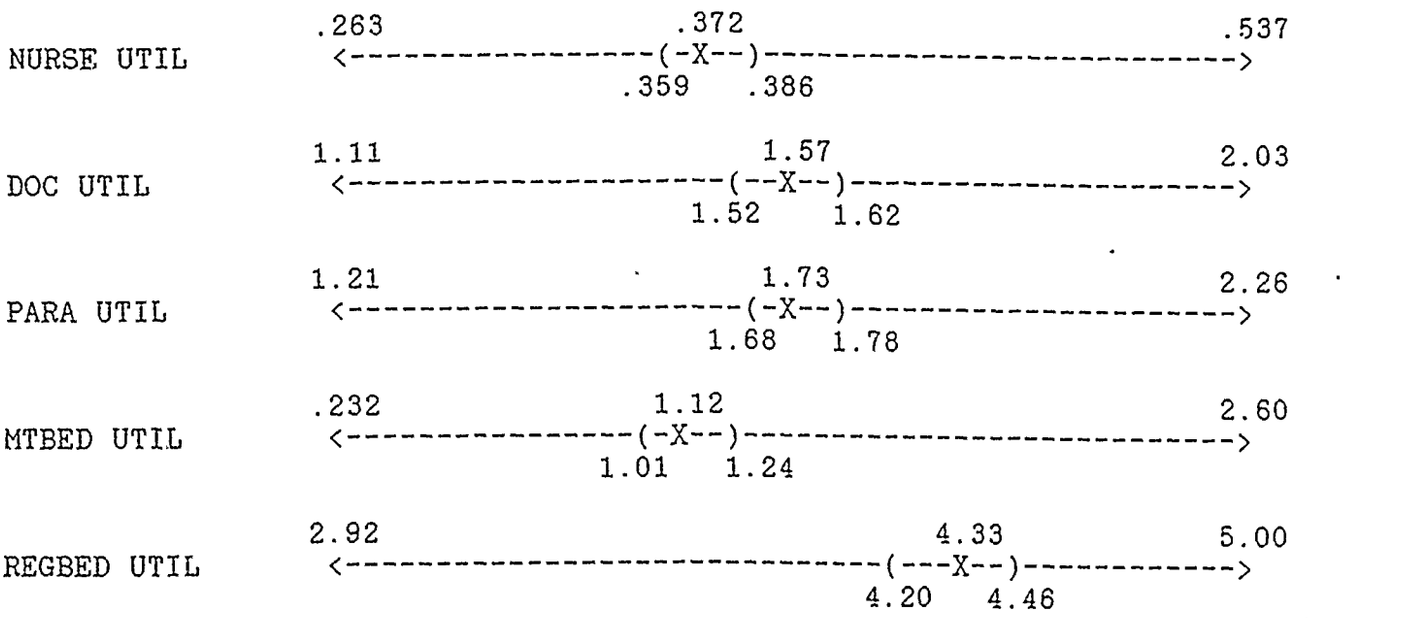
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

Baseline
T 1 para
output 37

INTERVALS: RESOURCE UTILIZATION (+1 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.372	5.958E-02	1.371E-02	.263	.537	75
DOC UTIL	1.57	.223	5.141E-02	1.11	2.03	75
PARA UTIL	1.73	.223	5.140E-02	1.21	2.26	75
MTBED UTIL	1.12	.506	.116	.232	2.60	75
REGBED UTIL	4.33	.572	.132	2.92	5.00	75

INTERVALS : RESOURCE UTILIZATION



< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

Baseline
↓ 1 Para
Run 15

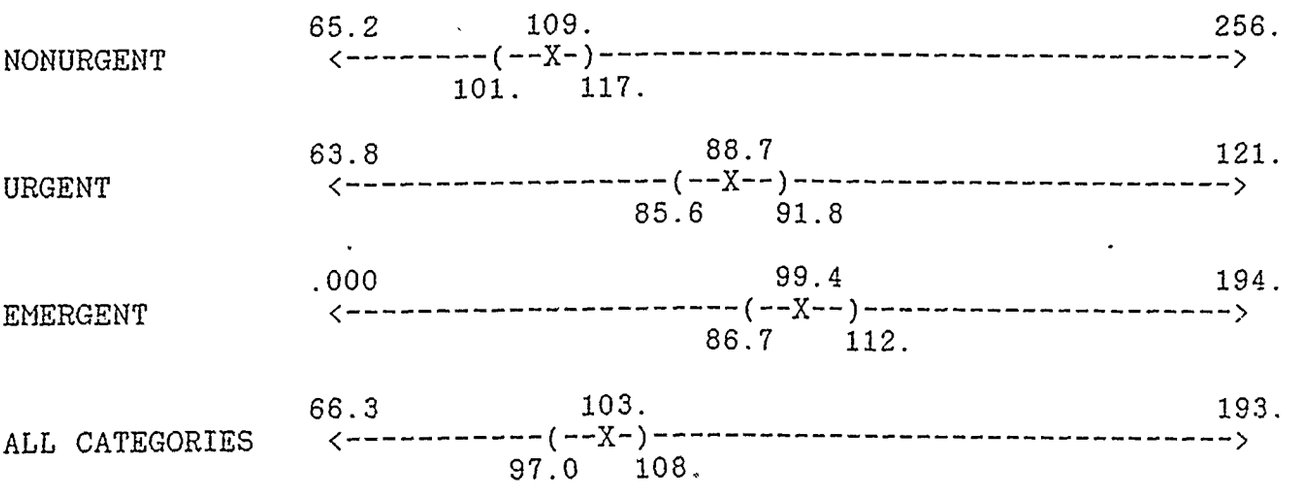
```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980;(-1 PARA)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,6:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
```

Baseline
+ 1 Para
Dept. 37

INTERVALS: AVG VISIT TIME (-1 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	109.	36.1	8.30	65.2	256.	75
URGENT	88.7	13.4	3.08	63.8	121.	75
EMERGENT	99.4	55.2	12.7	.000	194.	75
ALL CATEGORIES	103.	24.4	5.62	66.3	193.	75

INTERVALS : AVG VISIT TIME

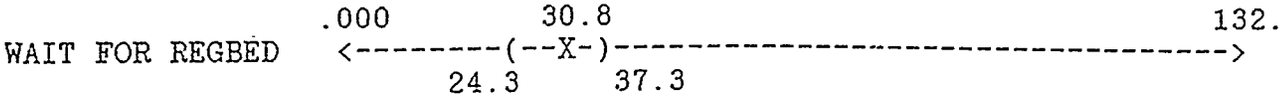


< = MINIMUM	(= LOWER 95% CL	X = AVERAGE	) = UPPER 95% CL	> = MAXIMUM

INTERVALS: WAIT FOR RESOURCES (-1 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	30.8	28.3	6.52	.000	132.	75

INTERVALS : WAIT FOR RESOURCES



¦ < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM ¦

Baseline
V 1 Para
output 34

INTERVALS: RESOURCE UTILIZATION (-1 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.368	6.508E-02	1.497E-02	.200	.537	75
DOC UTIL	1.56	.210	4.838E-02	1.01	2.03	75
PARA UTIL	1.71	.213	4.894E-02	1.15	2.26	75
MTBED UTIL	1.10	.467	.107	.317	2.18	75
REGBED UTIL	4.33	.614	.141	2.84	5.00	75

INTERVALS : RESOURCE UTILIZATION

```
                .200                      .368                      .537
NURSE UTIL       <-----------------------(-X--)----------------------->
                                        .353  .383

               1.01                      1.56                      2.03
DOC UTIL         <-----------------------(-X--)----------------------->
                                       1.51  1.60

               1.15                      1.71                      2.26
PARA UTIL        <-----------------------(--X-)----------------------->
                                       1.66  1.76

                .317                    1.10                      2.18
MTBED UTIL       <--------------------(--X--)------------------------->
                                    .989   1.20

               2.84                                4.33             5.00
REGBED UTIL      <-------------------------------(--X---)------------->
                                              4.19  4.48
```

< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980; (-2 PARA).
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,5:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
              9,NO OF CONSULT PT,,YES:
              10,TOTAL ADMISSIONS,,YES;
```

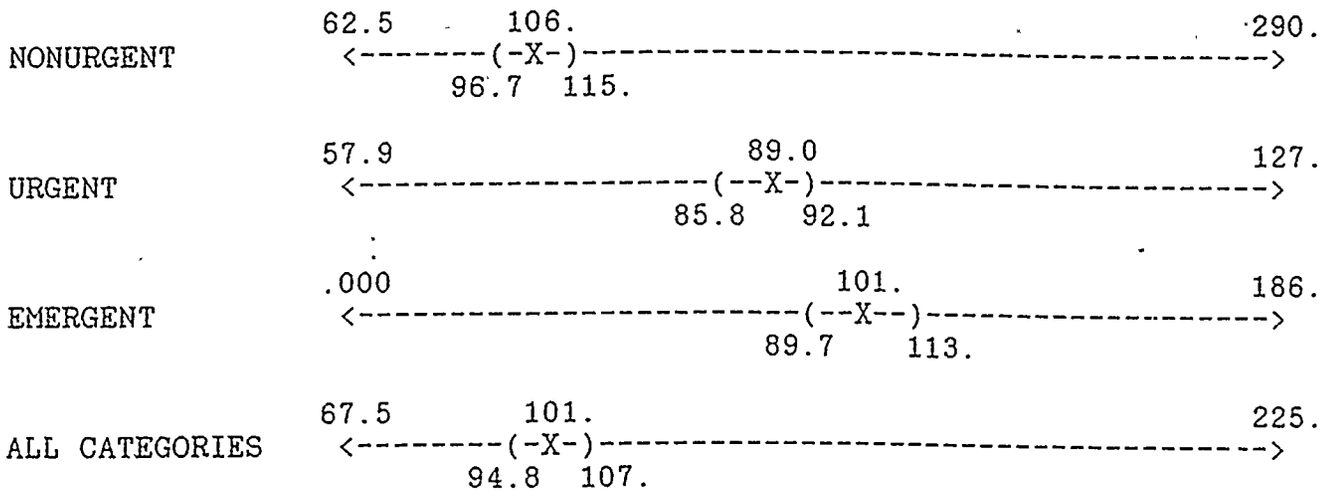
Baseline
↓ 2 PARA
RUN 16.OUT

Boxplot
& 2 Para
output .32

INTERVALS: AVE VISIT TIME (– 2 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	106.	40.3	9.27	62.5	290.	75
URGENT	89.0	13.7	3.16	57.9	127.	75
EMERGENT	101.	50.7	11.7	.000	186.	75
ALL CATEGORIES	101.	26.9	6.19	67.5	225.	75

INTERVALS : AVE VISIT TIME

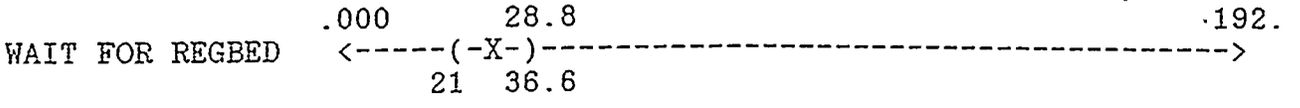


< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

INTERVALS: WAIT FOR RESOURCES (-2 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	28.8	33.7	7.76	.000	192.	75

INTERVALS : WAIT FOR RESOURCES

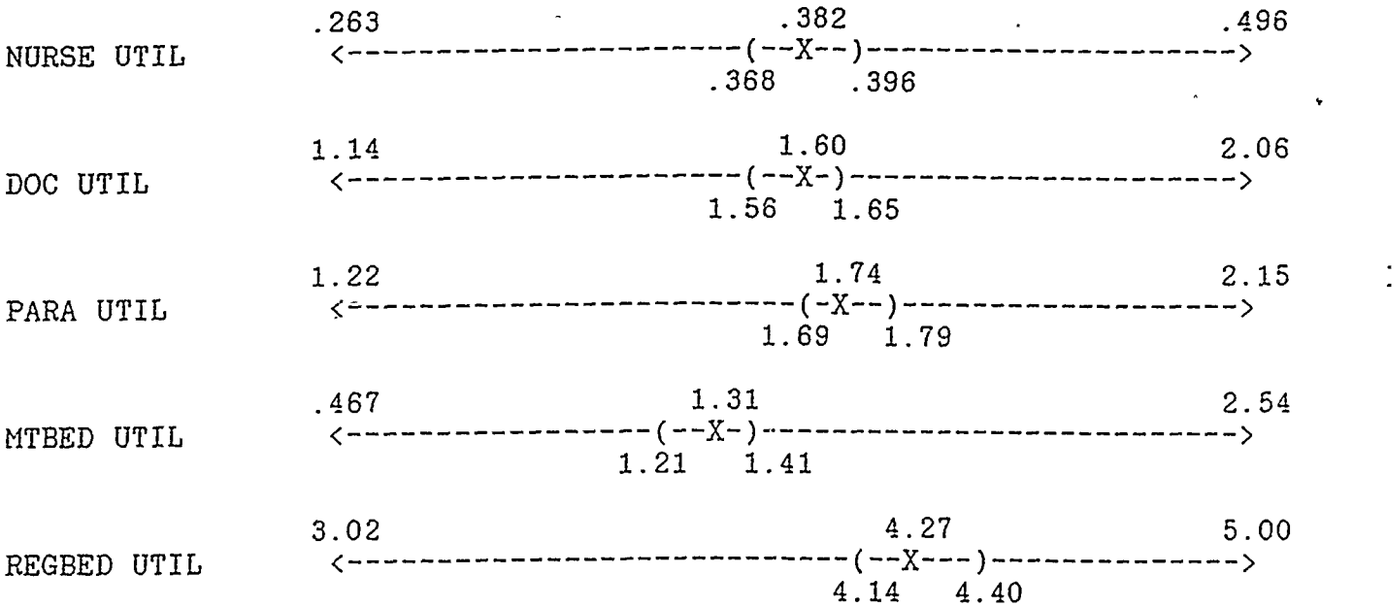


< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

INTERVALS: RESOURCE UTILIZATION (-1 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.382	6.286E-02	1.446E-02	.263	.496	75
DOC UTIL	1.60	.196	4.514E-02	1.14	2.06	75
PARA UTIL	1.74	.216	4.980E-02	1.22	2.15	75
MTBED UTIL	1.31	.435	.100	.467	2.54	75
REGBED UTIL	4.27	.569	.131	3.02	5.00	75

INTERVALS : RESOURCE UTILIZATION



< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

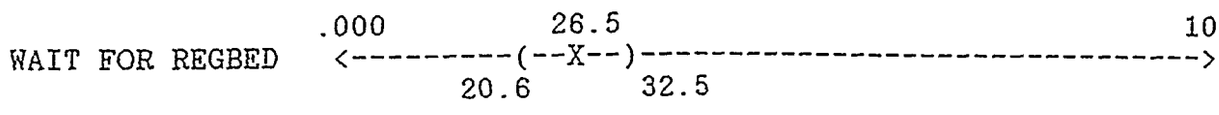
Baseline
↓3 Para
Run 2.04C

```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980;(-3PARA)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,4:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF DX PATIENT,,YES:
```

INTERVALS: WAIT FOR RESOURCES (-3 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	26.5	25.9	5.96	.000	102.	75

INTERVALS : WAIT FOR RESOURCES



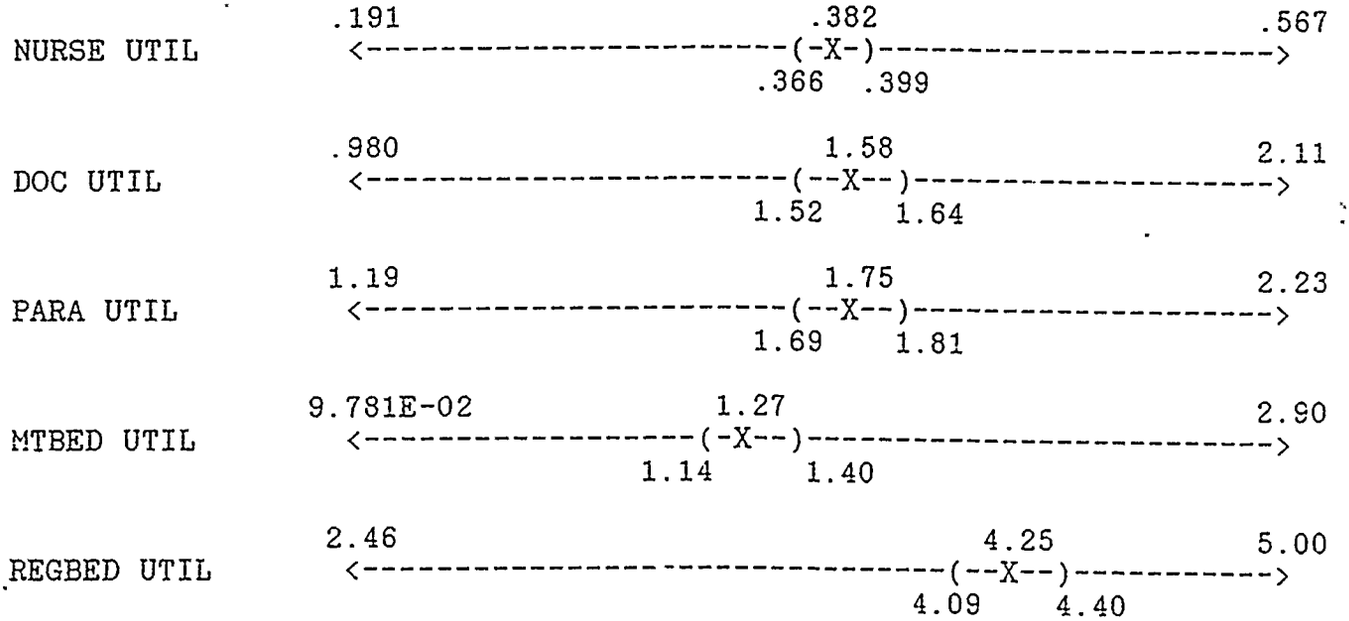
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

Baseline
↓ 31 runs
output.19

INTERVALS: RESOURCE UTILIZATION (-3 PARA)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.382	7.226E-02	1.663E-02	.191	.567	75
DOC UTIL	1.58	.260	5.992E-02	.980	2.11	75
PARA UTIL	1.75	.257	5.919E-02	1.19	2.23	75
MTBED UTIL	1.27	.577	.133	9.781E-02	2.90	75
REGBED UTIL	4.25	.678	.156	2.46	5.00	75

INTERVALS : RESOURCE UTILIZATION



< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980;(+1 MTBED)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951;2,1,3:        !DP>
              2,.316,49,.842,30,1,99:     !DP>
              3,16.80;                    !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,5:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
              9,NO OF CONSULT PT,,YES:
```

INTERVALS: AVG VISIT TIME (+1 MTBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	104.	36.4	8.38	70.0	257.	75
URGENT	85.7	11.2	2.58	64.4	117.	75
EMERGENT	91.8	58.9	13.5	.000	194.	75
ALL CATEGORIES	98.4	22.9	5.26	69.6	184.	75

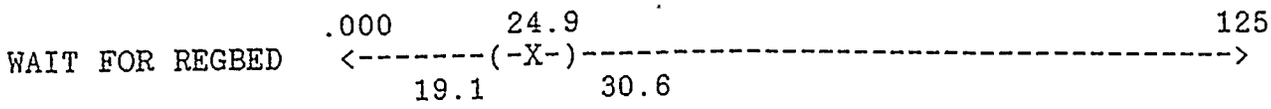
INTERVALS : AVG VISIT TIME

```
                   70.0      104.                                             257.
NONURGENT          <------(-X-)----------------------------------------->
                        95.2   112.

                   64.4              85.7                                     117.
URGENT             <----------------(--X-)-------------------------->
                                83.2    88.3

                   .000                 91.8                                  194.
EMERGENT           <------------------(--X---)---------------------->
                                   78.2      105.

                   69.6        98.4                                           184.
ALL CATEGORIES     <---------(--X-)------------------------------------>
                          93.1    104.

-------------------------------------------------------------------------------------
| < = MINIMUM   ( = LOWER 95% CL   X = AVERAGE   ) = UPPER 95% CL   > = MAXIMUM |
-------------------------------------------------------------------------------------
```

INTERVALS: WAIT FOR RESOURCES (+1 MTBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	24.9	25.0	5.76	.000	125.	75

INTERVALS : WAIT FOR RESOURCES



< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

INTERVALS: RESOURCE UTILIZATION (+1 MTBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.365	7.039E-02	1.620E-02	.183	.537	75
DOC UTIL	1.53	.238	5.472E-02	.830	2.03	75
PARA UTIL	1.67	.242	5.560E-02	.886	2.26	75
MTBED UTIL	1.11	.550	.127	.148	2.56	75
REGBED UTIL	4.17	.594	.137	1.84	5.00	75

INTERVALS : RESOURCE UTILIZATION

```
                .183                    .365                     .537
NURSE UTIL      <----------------------(-X--)--------------------->
                                     .349   .381

                .830                       1.53                  2.03
DOC UTIL        <-------------------------(--X-)------------------>
                                        1.47   1.58

                .886                      1.67                   2.26
PARA UTIL       <-------------------------(-X-)------------------->
                                        1.62  1.73

                .148             1.11                            2.56
MTBED UTIL      <----------------(-X--)--------------------------->
                               .981   1.23

                1.84                                 4.17        5.00
REGBED UTIL     <-----------------------------------(--X-)-------->
                                                  4.04   4.31

 -------------------------------------------------------------------------------
 ! < = MINIMUM  ( = LOWER 95% CL  X = AVERAGE  ) = UPPER 95% CL  > = MAXIMUM !
 -------------------------------------------------------------------------------
```

↑ 2 MTBED
Run 11.OUT

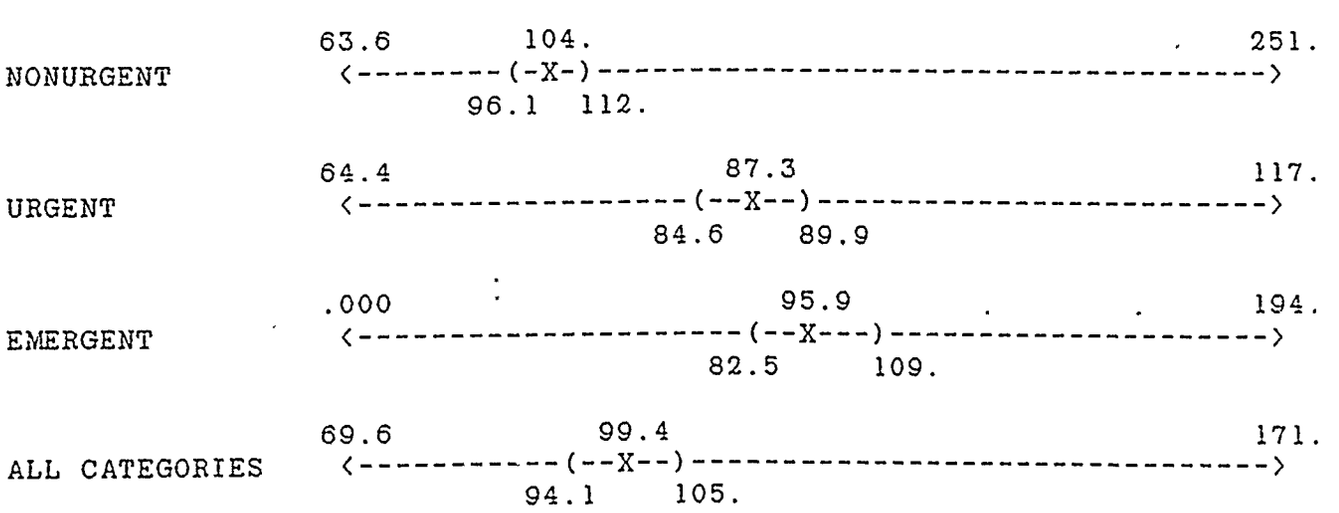
```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980;(+2 MTBED)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,6:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
              9,NO OF CONSULT PT,,YES:
```

Basic's
T 2 MTBED
output.nc

INTERVALS: AVG VISIT TIME (+2 MTBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	104.	34.2	7.87	63.6	251.	75
URGENT	87.3	11.6	2.67	64.4	117.	75
EMERGENT	95.9	58.2	13.4	.000	194.	75
ALL CATEGORIES	99.4	22.7	5.22	69.6	171.	75

INTERVALS : AVG VISIT TIME

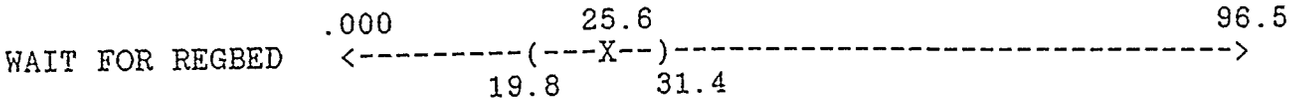


! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

INTERVALS: WAIT FOR RESOURCES (+2 MTBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	25.6	25.2	5.79	.000	96.5	75

INTERVALS : WAIT FOR RESOURCES



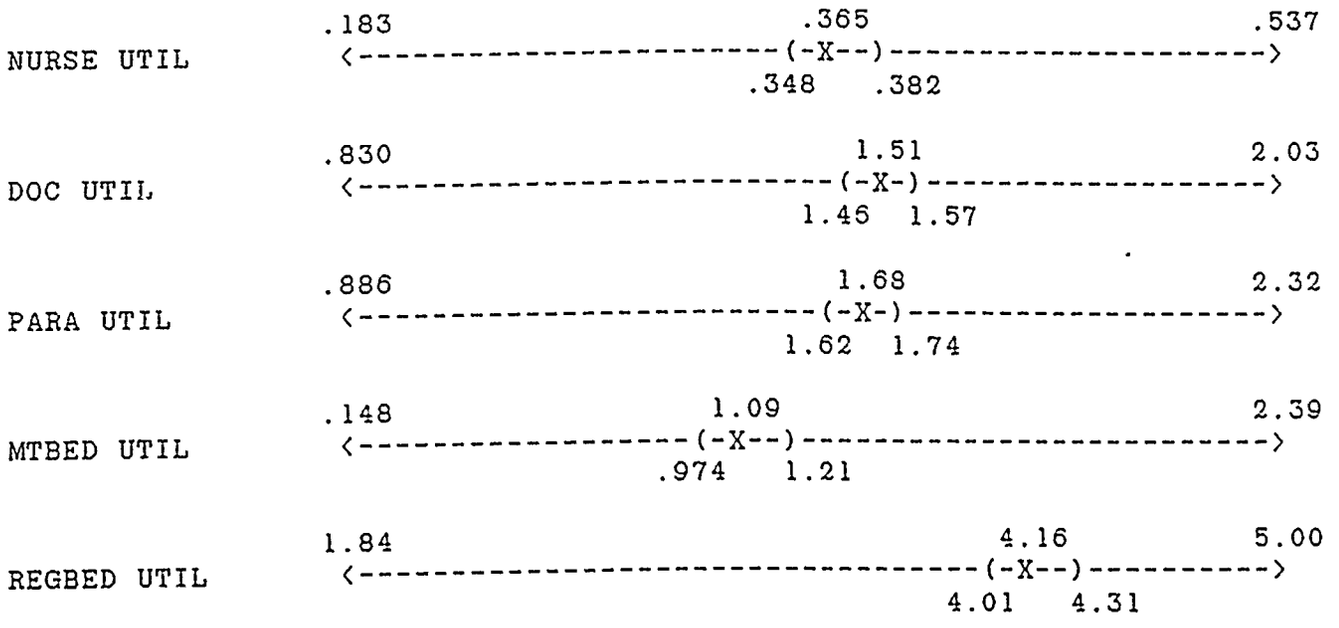
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

Results with 2 MTBED output.4

INTERVALS: RESOURCE UTILIZATION (+2 MTBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.365	7.194E-02	1.655E-02	.183	.537	75
DOC UTIL	1.51	.241	5.551E-02	.830	2.03	75
PARA UTIL	1.68	.261	6.003E-02	.886	2.32	75
MTBED UTIL	1.09	.510	.117	.148	2.39	75
REGBED UTIL	4.16	.650	.150	1.84	5.00	75

INTERVALS : RESOURCE UTILIZATION



! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980; (+1 REGBED)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,4:
              5,REGBED,6;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8.NO OF RX PATIENT,,YES:
```

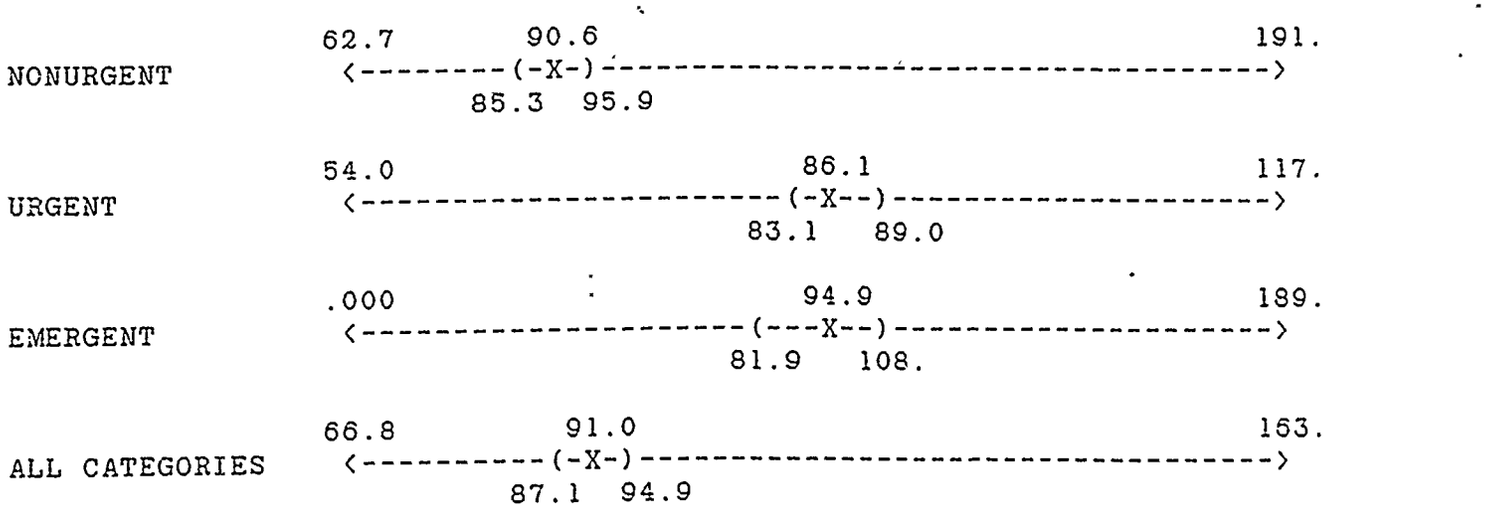
Baseline
T(1) Regbd
. Run12.out

+1 RegBed
c
comp=.45

INTERVALS: AVG WAIT TIME (+1 REGBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	90.6	23.0	5.28	62.7	191.	75
URGENT	86.1	12.9	2.96	54.0	117.	75
EMERGENT	94.9	56.6	13.0	.000	189.	75
ALL CATEGORIES	91.0	17.1	3.92	66.8	163.	75

INTERVALS : AVG WAIT TIME

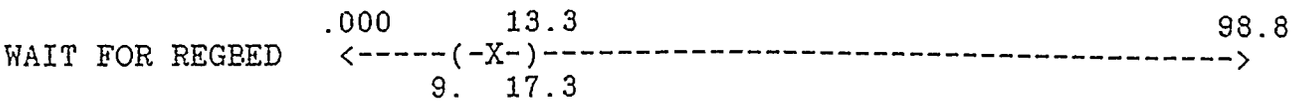


! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

INTERVALS: WAIT FOR RESOURCES (+1 REGBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	13.3	17.4	4.00	.000	98.8	75

INTERVALS : WAIT FOR RESOURCES



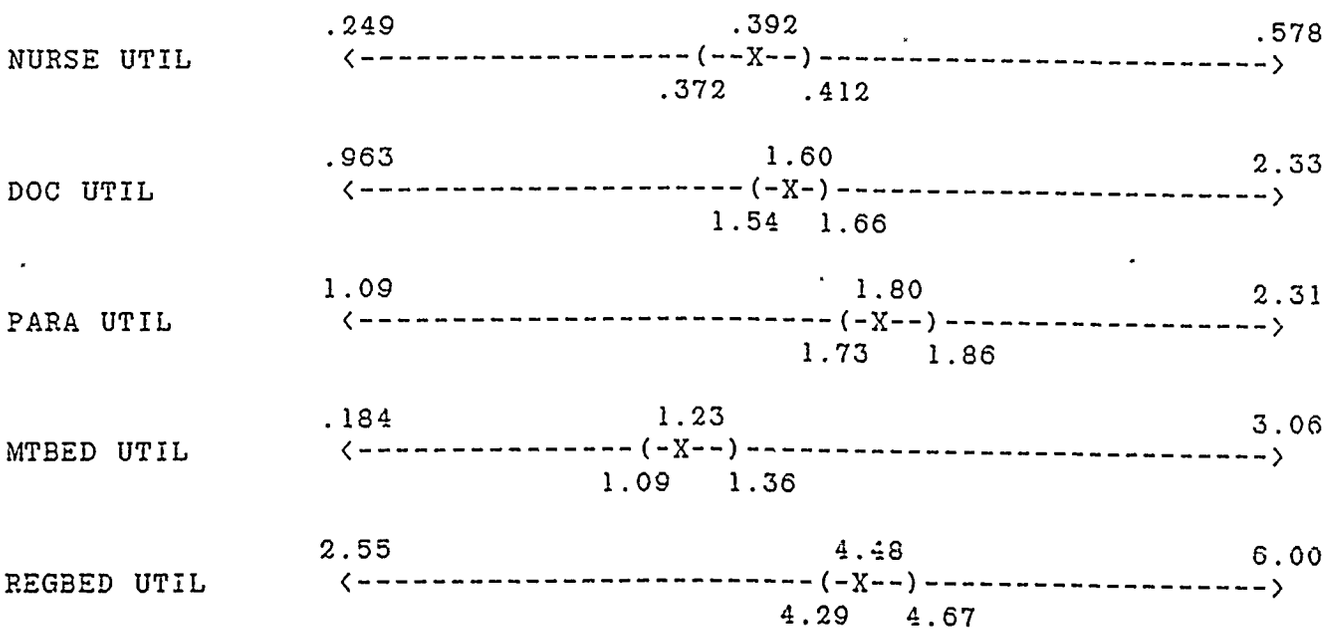
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

Basic TC + Limited output-C.43

INTERVALS: RESOURCE UTILIZATION (+1 REGBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.392	8.547E-02	1.966E-02	.249	.578	75
DOC UTIL	1.60	.265	6.087E-02	.963	2.33	75
PARA UTIL	1.80	.292	6.723E-02	1.09	2.31	75
MTBED UTIL	1.23	.571	.131	.184	3.06	75
REGBED UTIL	4.48	.830	.191	2.55	6.00	75

INTERVALS : RESOURCE UTILIZATION



! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

Baseline
T (2) Regbed
Run 14.047

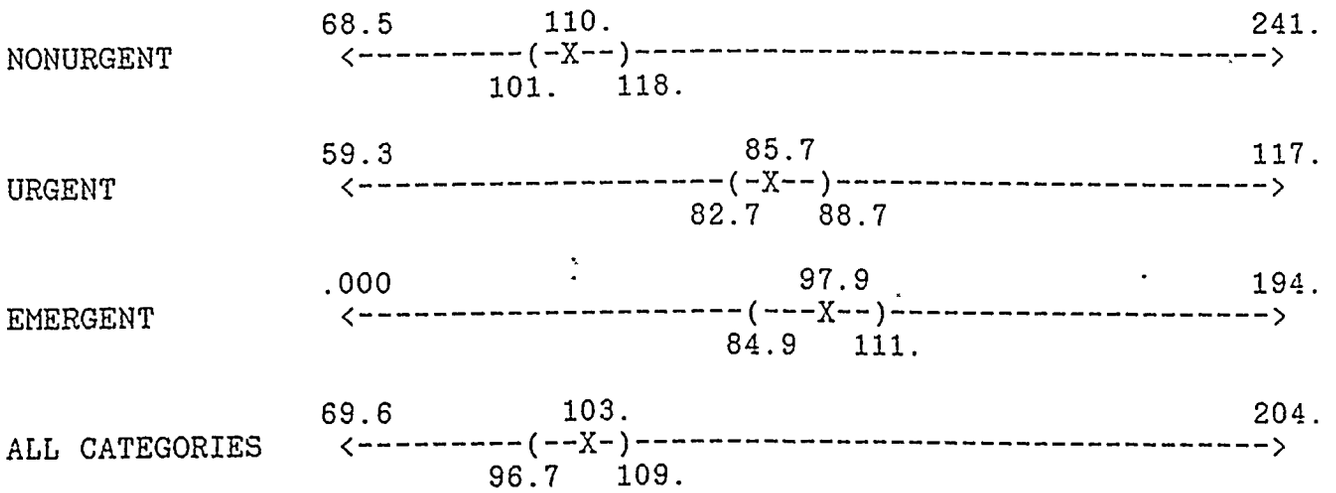
```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980;(+2 REGBED)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,16.80;                      !EX>
;
TABLES       :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
              16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,4:
              5,REGBED,7;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8.NO OF RX PATIENT,,YES:
```

Baseline
T 2 rebed
Output.39.

INTERVALS: AVG WAIT TIME (+2 REBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	110.	37.5	8.63	68.5	241.	75
URGENT	85.7	12.9	2.97	59.3	117.	75
EMERGENT	97.9	56.5	13.0	.000	194.	75
ALL CATEGORIES	103.	26.2	6.04	69.6	204.	75

INTERVALS : AVG WAIT TIME

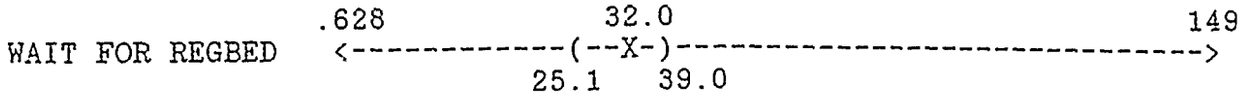


< = MINIMUM	(= LOWER 95% CL	X = AVERAGE	) = UPPER 95% CL	> = MAXIMUM

INTERVALS: WAIT FOR RESOURCES (+2 REGBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	32.0	30.2	6.96	.628	149	75

INTERVALS : WAIT FOR RESOURCES



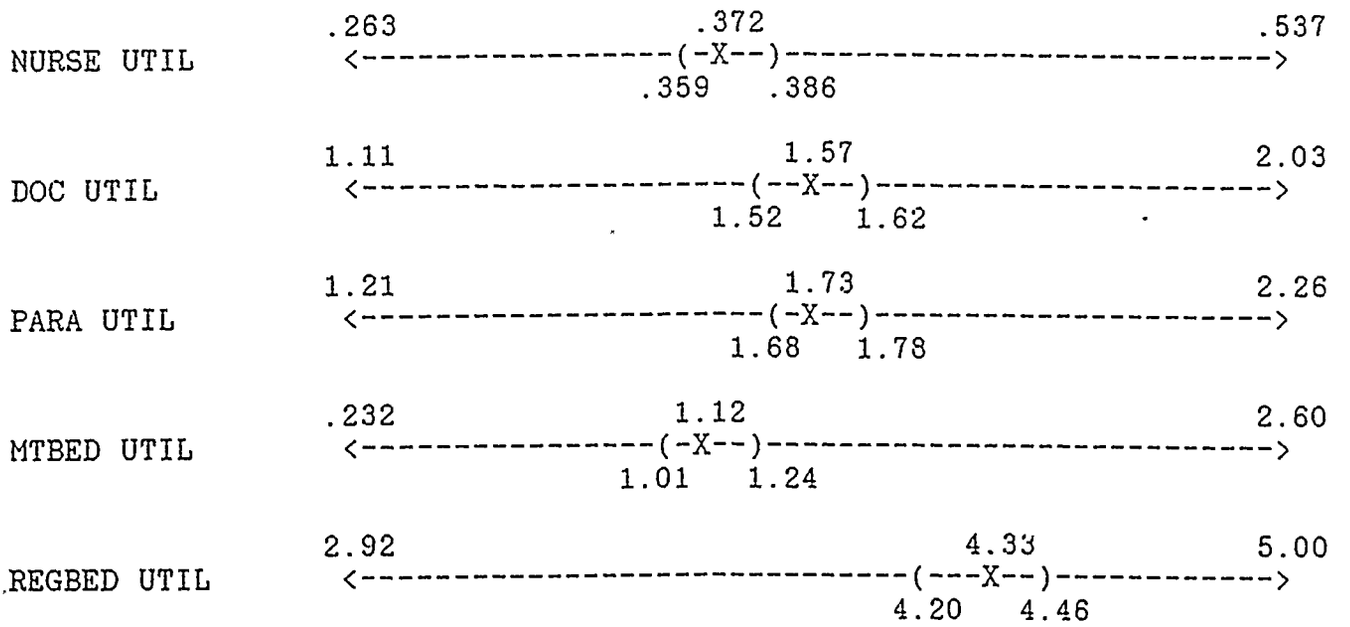
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

Baseline
T2 Revised
OUTPUT.37

INTERVALS: RESOURCE UTILIZATION (+2 REGBED)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.372	5.958E-02	1.371E-02	.263	.537	75
DOC UTIL	1.57	.223	5.141E-02	1.11	2.03	75
PARA UTIL	1.73	.223	5.140E-02	1.21	2.26	75
MTBED UTIL	1.12	.506	.116	.232	2.60	75
REGBED UTIL	4.33	.572	.132	2.92	5.00	75

INTERVALS : RESOURCE UTILIZATION



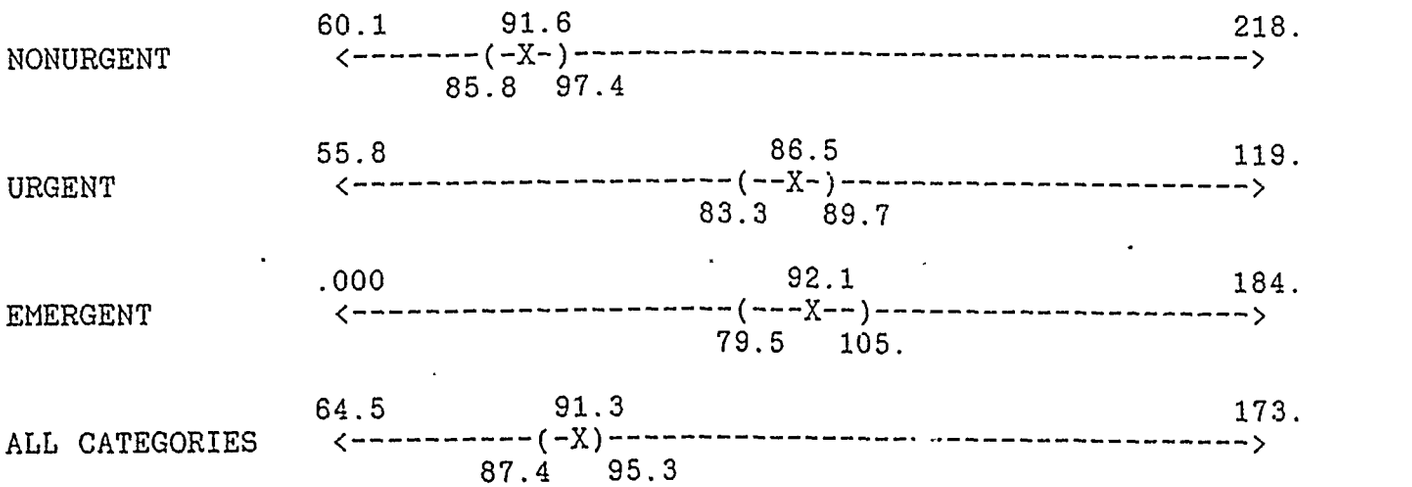
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

```
BEGIN;
;
PROJECT       ,XXXXX,XXXXX,4/23/1980; (+1 MTBED/+1 DOC)
;
DISCRETE      ,300,30,30,10;
;
PARAMETERS    :1,.634,1,.951,2,1,3:          !DP>
               2,.316,49,.842,30,1,99:       !DP>
               3,16.80;                      !EX>
;
TABLES        :1,0,60,16.80,16.15,14.00,16.15,12.73,15.56,13.13,
               16.15,12.73,12.73,12.73,16.15,19.09;
;
RANKINGS      :1-30,HVF(1);
;
RESOURCES     :1,DOC,SCHED(1):
               2,NURSE,1:
               3,PARA,7:
               4,MTBED,5:
               5,REGBED,5;
;
SCHEDULES     :1,3*360,4*360,3*60;
;
DSTAT         :1,NR(2),NURSE UTIL:
               2,NR(1),DOC UTIL:
               3,NR(3),PARA UTIL:
               4,NR(4),MTBED UTIL:
               5,NR(5),REGBED UTIL:
               6,NQ(1),NO IN MTBED QUE:
               7,NQ(2),NO IN MTDOC QUE:
               8,NQ(3),NO IN REGBED QUE:
               9,NQ(4),NO IN REGDOC QUE:
               10,NQ(5),NO IN DOC2 QUE:
               11,NQ(6),NO IN DOCNU1 QUE:
               12,NQ(7),NO IN DOCNU2 QUE:
               13,NQ(8),NO IN DNP1 QUE:
               14,NQ(9),NO IN DNP2 QUE:
               15,NQ(10),NO IN DNP3 QUE:
               16,NQ(11),NO IN DOCPA1 QUE:
               17,NQ(12),NO IN DOCPA2 QUE:
               18,NQ(13),NO IN NUPA1 QUE:
               19,NQ(14),NO IN NUPA2 QUE:
               20,NQ(15),NO IN NADMIT QUE:
               21,NQ(16),NO IN PADMIT QUE;
;
TALLIES       :1,AVE TIS CAT 1:
               2,AVE TIS CAT 2:
               3,AVE TIS CAT 3:
               4,AVE TIS ALL CAT:
               5,MTBED AVE WAIT:
               6,MTDOC AVE WAIT:
               7,REGBED AVE WAIT:
               8,REGDOC AVE WAIT:
               9,DOC2 AVE WAIT;
;
COUNTERS      :1,PATIENT TYPE 1,,YES:
               2,PATIENT TYPE 2,,YES:
               3,PATIENT TYPE 3,,YES:
               4,TOTAL PATIENTS,,YES:
               5,MTBED PATIENTS,,YES:
               6,REGBED PATIENTS,,YES:
               7,NO OF DX PATIENT,,YES:
               8,NO OF RX PATIENT,,YES:
```

INTERVALS: AVG VISIT TIME (+1 MTRED/+1 DOC)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	91.6	25.3	5.82	60.1	218.	75
URGENT	86.5	13.7	3.16	55.8	119.	75
EMERGENT	92.1	55.0	12.6	.000	184.	75
ALL CATEGORIES	91.3	17.1	3.94	64.5	173.	75

INTERVALS : AVG VISIT TIME

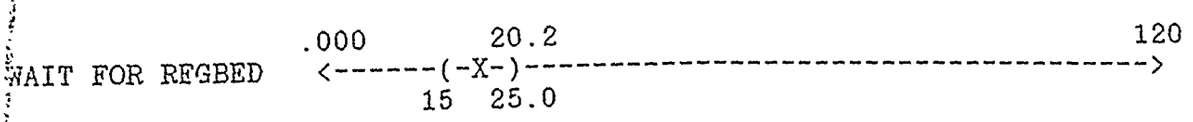


< = MINIMUM	(= LOWER 95% CL	X = AVERAGE	) = UPPER 95% CL	> = MAXIMUM

INTERVALS: WAIT FOR RESOURCES (+1 MTBED/+1 DOC)

ENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
AIT FOR REGBED	20.2	20.9	4.81	.000	120	75

INTERVALS : WAIT FOR RESOURCES

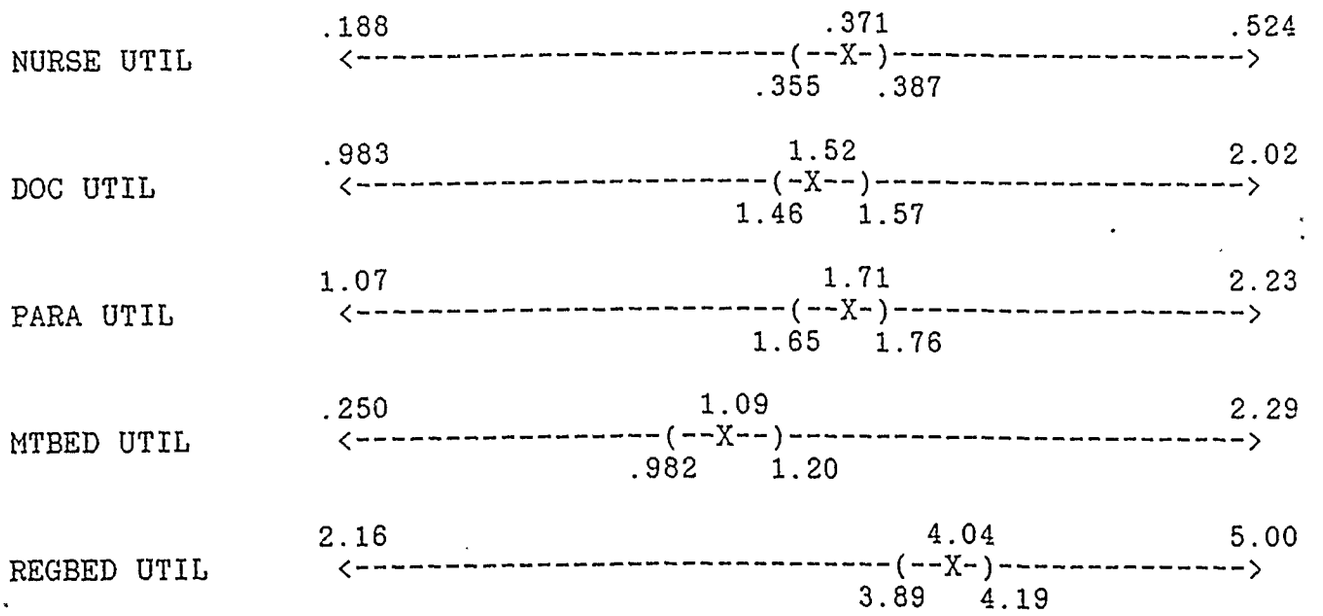


< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

INTERVALS: RESOURCE UTILIZATION (+1 MTBED/+1 DOC)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.371	7.038E-02	1.619E-02	.188	.524	75
DOC UTIL	1.52	.228	5.252E-02	.983	2.02	75
PARA UTIL	1.71	.249	5.726E-02	1.07	2.23	75
MTBED UTIL	1.09	.477	.110	.250	2.29	75
REGBED UTIL	4.04	.643	.148	2.16	5.00	75

INTERVALS : RESOURCE UTILIZATION



< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

20% ↑ patients treated
Runs.out

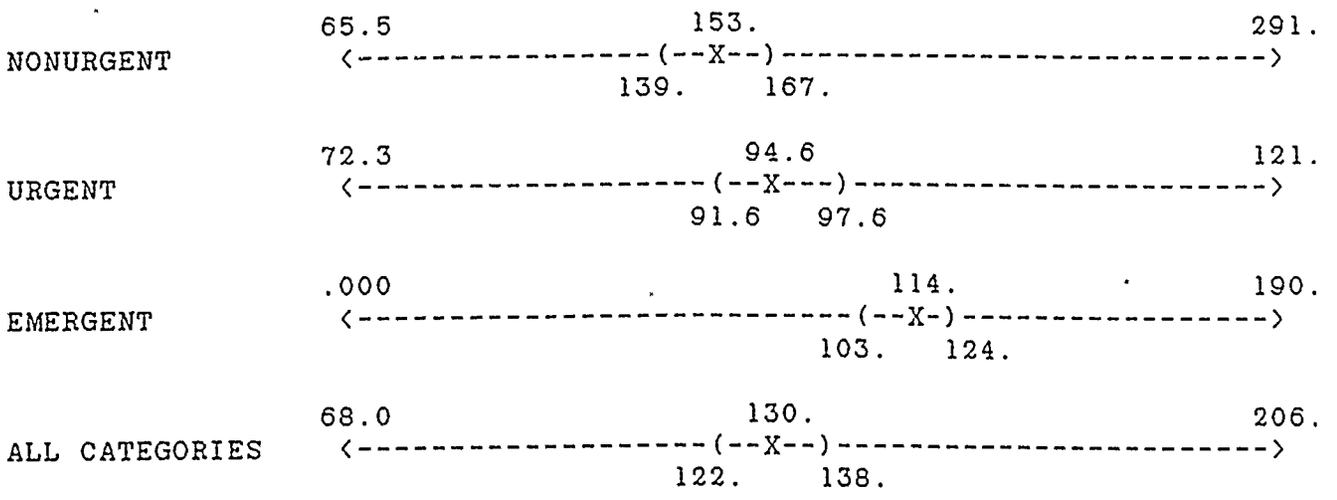
```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980; (+20% PATIENTS)
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:        !DP>
              2,.316,49,.842,30,1,99:     !DP>
              3,14.01;                    !EX>
;
TABLES       :1,0,60,14.01,13.48,11.66,13.48,10.62,12.95,10.94,
              13.48,10.62,10.62,10.62,13.48,15.92;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
              9.NO OF CONSULT PT,,YES:
```

20% Patients test
output.74

INTERVALS: AVG VISIT TIME (+20% PATIENTS)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	153.	61.0	14.0	65.5	291.	75
URGENT	94.6	13.1	3.02	72.3	121.	75
EMERGENT	114.	44.2	10.2	.000	190.	75
ALL CATEGORIES	130.	35.0	8.05	68.0	206.	75

INTERVALS : AVG VISIT TIME

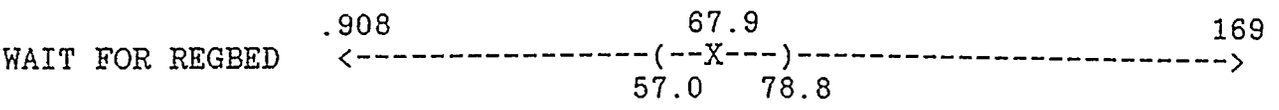


< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

INTERVALS: WAIT FOR RESOURCES (+20% PATIENTS)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	67.9	47.4	10.9	.908	169	75

INTERVALS : WAIT FOR RESOURCES



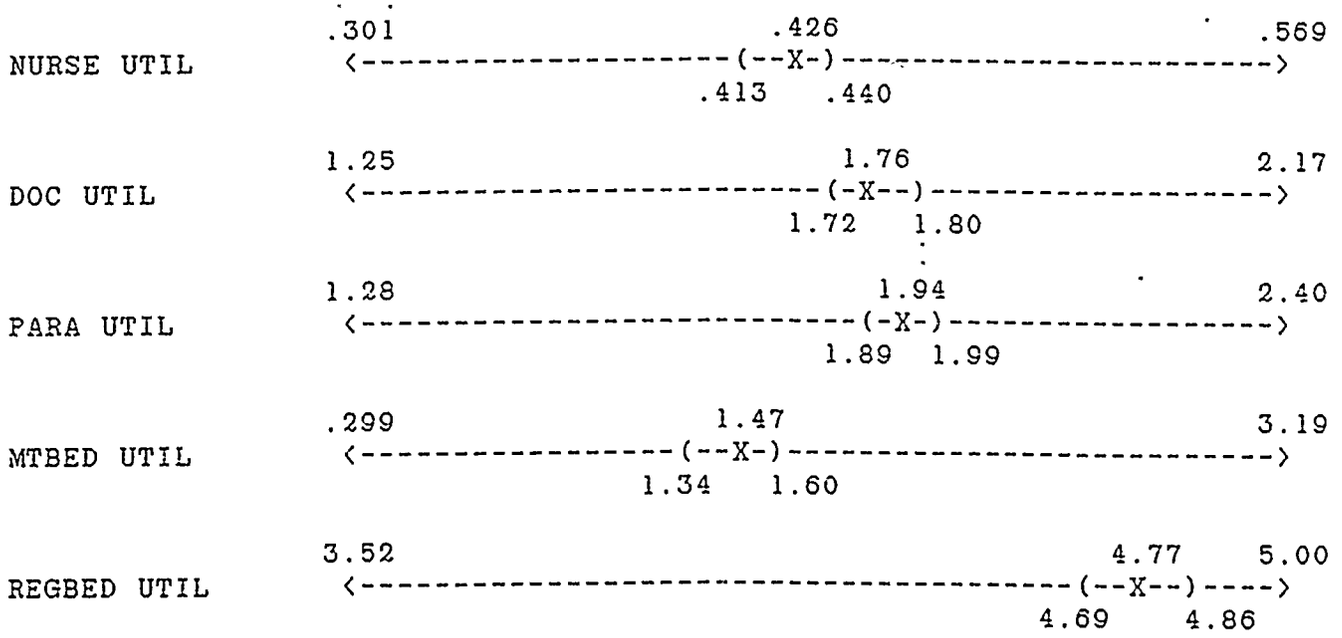
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

20% T patients
output.76

INTERVALS: RESOURCE UTILIZATION (+20% PATIENTS)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.426	5.767E-02	1.327E-02	.301	.569	75
DOC UTIL	1.76	.192	4.425E-02	1.25	2.17	75
PARA UTIL	1.94	.211	4.843E-02	1.28	2.40	75
MTBED UTIL	1.47	.577	.133	.299	3.19	75
REGBED UTIL	4.77	.371	8.530E-02	3.52	5.00	75

INTERVALS : RESOURCE UTILIZATION



; < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM ;

+30 % PATIENTS

30 % ↑ patients
Run6.out

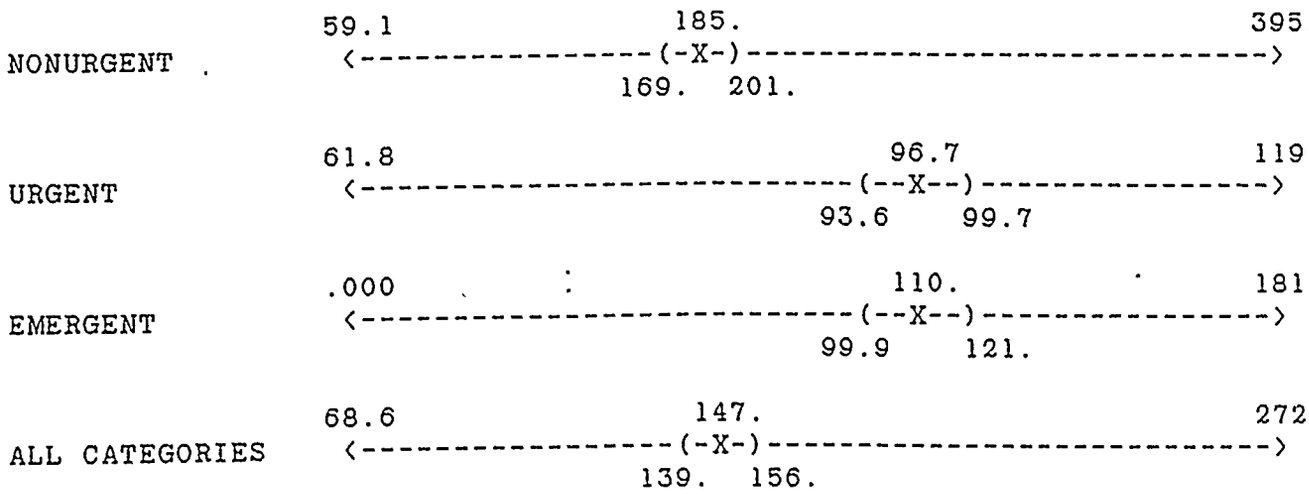
```
BEGIN;
;
PROJECT      ,XXXXX,XXXXX,4/23/1980;
;
DISCRETE     ,300,30,30,10;
;
PARAMETERS   :1,.634,1,.951,2,1,3:          !DP>
              2,.316,49,.842,30,1,99:       !DP>
              3,12.93;                      !EX>
;
TABLES       :1,0,60,12.93,12.44,10.76,12.44,9.80,11.96,10.10,12.44,
              9.80,9.80,9.80,12.44,14.70;
;
RANKINGS     :1-30,HVF(1);
;
RESOURCES    :1,DOC,SCHED(1):
              2,NURSE,1:
              3,PARA,7:
              4,MTBED,4:
              5,REGBED,5;
;
SCHEDULES    :1,2*360,3*360,2*60;
;
DSTAT        :1,NR(2),NURSE UTIL:
              2,NR(1),DOC UTIL:
              3,NR(3),PARA UTIL:
              4,NR(4),MTBED UTIL:
              5,NR(5),REGBED UTIL:
              6,NQ(1),NO IN MTBED QUE:
              7,NQ(2),NO IN MTDOC QUE:
              8,NQ(3),NO IN REGBED QUE:
              9,NQ(4),NO IN REGDOC QUE:
              10,NQ(5),NO IN DOC2 QUE:
              11,NQ(6),NO IN DOCNU1 QUE:
              12,NQ(7),NO IN DOCNU2 QUE:
              13,NQ(8),NO IN DNP1 QUE:
              14,NQ(9),NO IN DNP2 QUE:
              15,NQ(10),NO IN DNP3 QUE:
              16,NQ(11),NO IN DOCPA1 QUE:
              17,NQ(12),NO IN DOCPA2 QUE:
              18,NQ(13),NO IN NUPA1 QUE:
              19,NQ(14),NO IN NUPA2 QUE:
              20,NQ(15),NO IN NADMIT QUE:
              21,NQ(16),NO IN PADMIT QUE;
;
TALLIES      :1,AVE TIS CAT 1:
              2,AVE TIS CAT 2:
              3,AVE TIS CAT 3:
              4,AVE TIS ALL CAT:
              5,MTBED AVE WAIT:
              6,MTDOC AVE WAIT:
              7,REGBED AVE WAIT:
              8,REGDOC AVE WAIT:
              9,DOC2 AVE WAIT;
;
COUNTERS     :1,PATIENT TYPE 1,,YES:
              2,PATIENT TYPE 2,,YES:
              3,PATIENT TYPE 3,,YES:
              4,TOTAL PATIENTS,,YES:
              5,MTBED PATIENTS,,YES:
              6,REGBED PATIENTS,,YES:
              7,NO OF DX PATIENT,,YES:
              8,NO OF RX PATIENT,,YES:
              9.NO OF CONSULT PT,,YES:
```

Bo 7o Patients
output. 78

INTERVALS: AVG VISIT TIME (+30% PATIENTS)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NONURGENT	185.	69.1	15.9	59.1	395.	75
URGENT	96.7	13.3	3.06	61.8	119.	75
EMERGENT	110.	45.6	10.5	.000	181.	75
ALL CATEGORIES	147.	38.6	8.88	68.6	272.	75

INTERVALS : AVG VISIT TIME

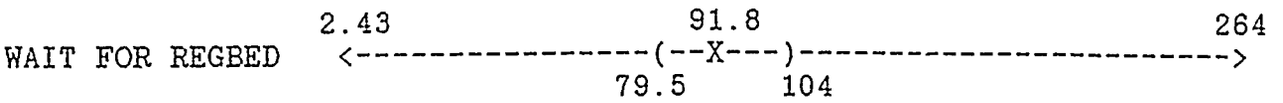


! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

INTERVALS: WAIT FOR RESOURCES (+30% PATIENTS)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
WAIT FOR REGBED	91.8	53.8	12.4	2.43	264	75

INTERVALS : WAIT FOR RESOURCES



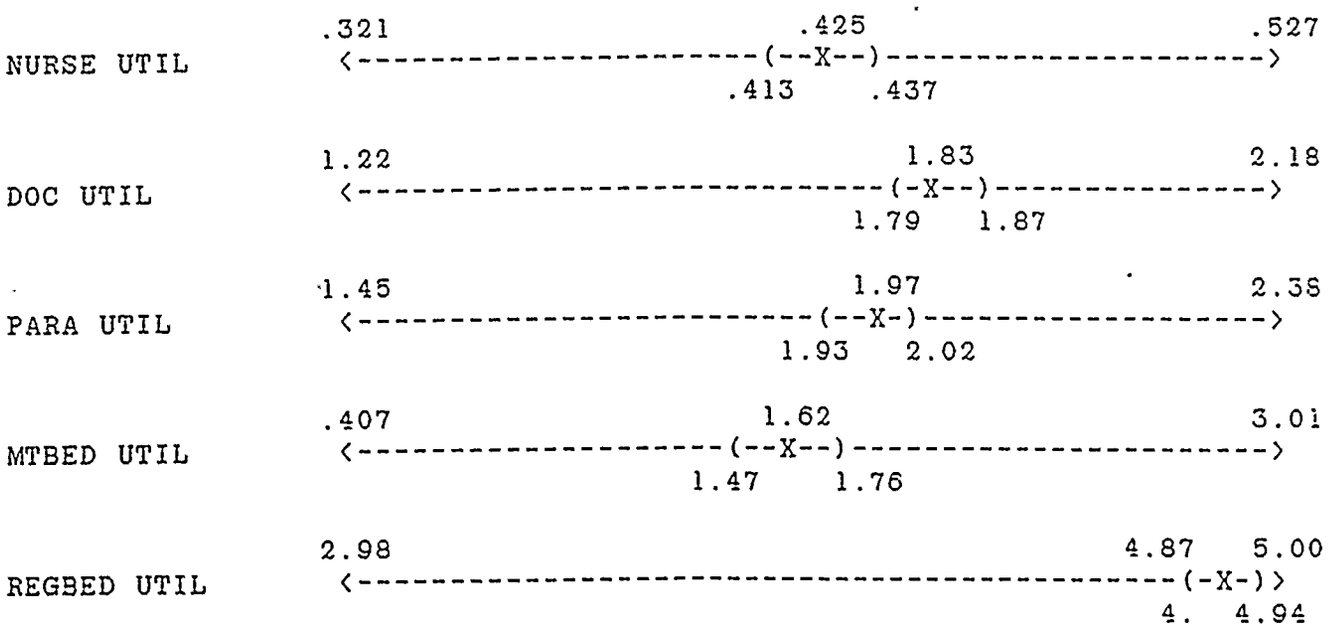
< = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM

30% T patients
Output #30

INTERVALS: RESOURCE UTILIZATION (+30% PATIENTS)

IDENTIFIER	AVERAGE	STANDARD DEVIATION	.950 C.I. HALF-WIDTH	MINIMUM VALUE	MAXIMUM VALUE	NUMBER OF OBS.
NURSE UTIL	.425	5.126E-02	1.179E-02	.321	.527	75
DOC UTIL	1.83	.186	4.271E-02	1.22	2.18	75
PARA UTIL	1.97	.192	4.413E-02	1.45	2.38	75
MTBED UTIL	1.62	.628	.145	.407	3.01	75
REGBED UTIL	4.87	.333	7.657E-02	2.98	5.00	75

INTERVALS : RESOURCE UTILIZATION



! < = MINIMUM (= LOWER 95% CL X = AVERAGE) = UPPER 95% CL > = MAXIMUM !

Table 1
Effects of Staffing Changes on Average Visit Time (min)

	Base Time	Doc +1	Doc +2	Nurse +1	Nurse +2	Para +1	Para -1	Para -2	Para -3
Nonurgent	110	94.8	94.8	105	100	110	109	106	105
Urgent	85.7	85.5	84.3	88.9	88.1	85.7	88.7	89	90
Emergent	97.9	97.5	93	96.5	113	97.9	99.4	101	104
All Cat	103	93.1	93	100	97.8	103	103	101	101

Table 2
Effects of Increasing Beds on Average Visit Times (min)

	Base Time	MTBED +1	MTBED +2	REGBED +1	REGBED +2
Nonurgent	110	104	104	90.6	110
Urgent	85.7	85.7	87.3	86.1	85.7
Emergent	97.9	91.8	95.9	94.9	97.9
All Cat	103	98.4	99.4	91	103

Table 3
Wait for a Regular Bed Across All Resource and Patient Census Changes (min)

	Base Line	Doc +1	Doc +2	Nurse +1	Nurse +2	Para +1	Para -1	Para -2	Para -3	MTBed +1	MTBed +2	RegBed +1	RegBed +2	Pts +20%	Pts +30%
Wait time (RegBed)	32.0	22.0	22.2	32.4	25.6	39.0	30.8	28.8	32.5	24.9	25.6	13.3	32.0	67.9	91.8

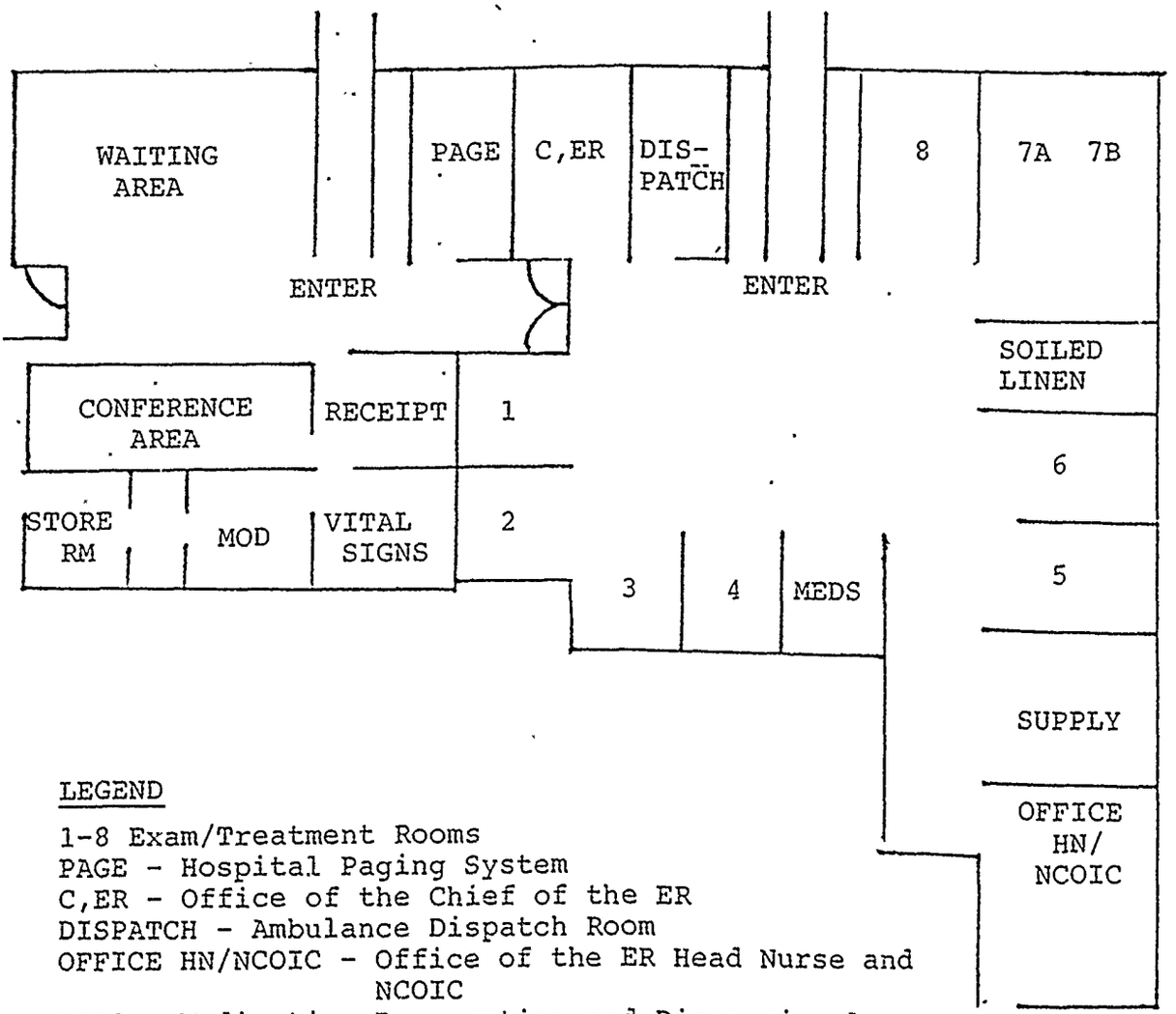
Table 4

Patient Care Utilization Rates Across All Resource and Patient Census Changes

	Actual	Base Line	Doc +1	Doc +2	Nurse +1	Nurse +2	Para +1	Para -1	Para -2	Para -3	MTBed +1	MTBed +2	RegBed +1	RegBed +2	Pts +20%	Pts +30%
Doc	2.5	1.57	1.54	1.54	1.55	1.61	1.57	1.56	1.60	1.58	1.53	1.51	1.60	1.57	1.76	1.83
Nurse	1	.372	.376	.375	.372	.380	.370	.368	.382	.382	.365	.365	.392	.372	.426	.425
Para	7	1.73	1.73	1.72	1.72	1.75	1.73	1.71	1.74	1.75	1.67	1.68	1.80	1.73	1.94	1.97
MTBed	4	1.12	1.03	1.11	1.10	1.31	1.12	1.10	1.31	1.27	1.11	1.09	1.23	1.12	1.47	1.62
RegBed	5	4.33	4.18	4.26	4.10	4.23	4.33	4.33	4.27	4.25	4.17	4.16	4.48	4.33	4.77	4.87

Table 5
Effects of physician and bed increases on average visit time

	Base Line	Doc + 1	RegBed + 1	Doc + 1 / RegBed + 1
NonUrgent	110	94.8	90.6	91.6
Urgent	85.7	85.5	86.1	86.5
Emergent	97.9	97.5	94.9	92.1
All Categories	103	93.1	91.0	91.3



LEGEND

1-8 Exam/Treatment Rooms
PAGE - Hospital Paging System
C,ER - Office of the Chief of the ER
DISPATCH - Ambulance Dispatch Room
OFFICE HN/NCOIC - Office of the ER Head Nurse and NCOIC
MEDS - Medication Preparation and Dispensing Area
VITAL SIGNS - Room where Vital Signs and Blood Pressure are Taken
MOD - Medical Officer of the Day Room
RECEIPT - Reception Area