AD716502

Final Report

Westinghouse
Health Systems

Systems Analysis Study Towards a New Generation of Military Hospitals

Volume 3
Medical Health Care Review

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
Springfield Va. 22151

SYSTEMS ANALYSIS STUDY TOWARDS A "NEW GENERATION" OF MILITARY HOSPITALS

VOLUME III: MEDICAL HEALTH CARE REVIEW

24 November 1970

Submitted by:
Westinghouse Electric Corporation
Health Systems Department
Research and Development Center
Pittsburgh, Pennsylvania 15235

Project Director
C. A. Sadlow, Director
Health Systems Department
Telephone No 412-256-7101

Sponsored by:
Advanced Research Projects Agency
ARPA Order No. 1494
Contract No. DAHC15 69 C 0354
25 June 1969 to 24 November 1970
$892,000

This research was supported by the
Advanced Research Projects Agency of
The Department of Defense under
Contract Number DAHC15 69 C 0354.

PREFACE

This is Volume III, Medical Health Care Review, of a five-volume final report submitted by the Westinghouse Electric Corporation to the Department of Defense for work performed on Contract Number DAHC15 69 C 0354, Systems Analysis Study Towards a "New Generation" of Military Hospitals.

The primary task of this study was to develop alternative hospital system designs, using current state-of-the-art concepts, technology, and management procedures with the objective of designing the most effective hospital for construction commencing in mid-1972. The secondary task was the definition of system improvements arising from R & D opportunities available in time for prototype construction in the 1975-1980 period.

The remaining four volumes contained in this report are:

VOLUME	TITLE
I	Executive Summary
II	Systems Analysis
IV	State of the Art
V	Data Inventory

ACKNOWLEDGEMENT

WESTINGHOUSE ELECTRIC CORPORATION PROJECT TEAM

The Westinghouse Project Team consisted of personnel from the following Westinghouse groups, subcontractors and universities as well as individual consultants

WESTINGHOUSE ELECTRIC CORPORATION

HEALTH SYSTEMS DEPARTMENT - Program Management

Systems Simulation & Control

Bioscience & Medical Systems

Corporate Design Center

Major Projects & Urban Systems

Learning Corporation

Medical Products Engineering

Urban Systems

Public Systems Management Services

Tele-Computer Systems Corp.

SUBCONTRACTORS

ROGERS, TALIAFERRO, KOSTRITSKY, LAMB, INC. - Systems Design

McKee-Berger-Mansueto, Inc. - Construction Costs

SYBRON CORPORATION - Distribution Systems

BRANDEGEE ASSOCIATES - Technical Writing

ADVISORY BOARD

D. J. Macer, M. S.
Assistant Vice Chancellor of Medical Professions, College of Medicine, University of Pittsburgh

M. J. Schaefer, Ph. D.
Dean, School of Nursing, University of Pittsburgh

H. E. Smalley, Ph. D.
Regents Professor & Director Health Systems Research Center, Georgia Institute of Technology

T. B. Turner, M. D.
Dean Emeritus, Johns Hopkins School of Medicine, Professor of Microbiology, The Johns Hopkins University

D. S. Wenger, M. D.
Associate Professor of Surgery, Chief of Traumatology, Department of Surgery, The George Washington University, School of Medicine

* Member Health Care Review Team

CONSULTANTS

A. Eggermann, Ph.D.
Medical and Hospital Liaison

L. G. Streidl
Health Services & Facility Planning

V. J. Treanor
Analysis and Design

GEORGIA INSTITUTE OF TECHNOLOGY

G. L. Delozier, Ph.D.
Industrial & Systems Engineering, Operations Research

UNIVERSITY OF MICHIGAN

R. C. Jelinek, Ph.D.
Operations Research Industrial Engineering

F. Munson, Ph.D.
Organization Theory

THE JOHNS HOPKINS UNIVERSITY

C. D. Flagle, Ph.D.
Operations Research, Cost Benefits

R. J. Johns, M.D.
Internal Medicine, Bioengineering

R. B. Coon, M.D.
Clinical Pathology

H. W. Love, Ph.D., M.D.
Surgery

STANFORD UNIVERSITY

R. D. Smallwood, Ph.D.
Systems Engineering

UNIVERSITY OF PITTSBURGH

*H. H. Kroeger, M.P.H.
Medical & Hospital Administration

N. Hershey, LL.B.
Health Law

*M. F. Hill, Ph.D.
Nursing Administration

*L. C. Barney, Ph.D.
Nursing, Medical-Surgical

*E. G. Saltz, M.D.
Pediatrics

*C. L. Rumble, M.D.
Psychiatry

W. A. George, D.D.S.
Dentistry

R. A. Cher, M.D.
Obstetrics & Gynecology

VETERANS ADMINISTRATION HOSPITAL, OAKLAND, PENNSYLVANIA

*F. C. Jackson, M.D.
Surgery

*F. D. W. Lukens, M.D.
Medicine

NORTH HILLS PASSAVANT HOSPITAL, PITTSBURGH, PENNSYLVANIA

G. S. Lerman, M.D.
Radiology

Westinghouse wishes to acknowledge and thank each member of the project team for his outstanding contribution and dedication to the project. Special thanks go to all the military personnel at each of the Base Level Health Care Systems studied for their cooperation and effort, and to the Department of Defense personnel who monitored this project.

Westinghouse also wishes to acknowledge the valuable contributions of the Veterans Administration, Kaiser Foundation Hospitals, Public Health Service Health Education and Welfare and the Bethlehem Steel Corporation and the United States Steel Corporation

ABSTRACT

The data presented in this volume were collected by the Westinghouse Medical Health Care Review Team, composed of physicians, nurses and a hospital administrator, during interviews and observations at the three primary Base Level Health Care Systems (BLHCS). The basic objective of this study was to identify and evaluate the critical elements within the BLHCS which directly or indirectly affect the delivery of professional services.

Results of observations/interviews and recommendations are presented for the following five elements basic to effective operation of a BLHCS:

1. The quality of personnel (i.e., qualifications, assignments and continuing education)

2. The facilities (space, beds, special care and diagnostic units and equipment)

3. The professional services (diagnostic, therapeutic and special)

4. Policies and practices for basic health services (outpatient and emergency department, admissions, etc.)

5. Quality control (tissue and hospital stay committees, death-complication conferences etc.).

TABLE OF CONTENTS

	Page
1. INTRODUCTION	1
SCOPE OF STUDY	1
WESTINGHOUSE APPROACH	4
STUDY CONSTRAINTS	7
PROBLEM IDENTIFICATION	8
RESULTS AND CONCLUSIONS	9
2. RECOMMENDATIONS	12
3. STUDY PROTOCOL	23
BACKGROUND	23
SCOPE OF STUDY	26
STUDY APPROACH	27
TEAM COMPOSITION	31
4. PRESENTATION OF RESULTS	33
4.1 OBSERVATIONS ON PERSONNEL	33
PHYSICIANS	34
NURSES	41
CORPSMEN, TECHNICIANS, AND SPECIALISTS	45
ALLIED HEALTH SPECIALISTS	49
RECOMMENDATIONS	50
4.2 FACILITIES: DESIGN, SPACE ALLOCATIONS, AND SERVICES	55
AMBULATORY MEDICAL SERVICES	55
INPATIENT FACILITIES	61
RECOMMENDATIONS	66

TABLE OF CONTENTS (Cont'd)

	Page
4.3 PROFESSIONAL PHYSICIAN SERVICES	70
MEDICAL SERVICES	70
SURGICAL SERVICES	72
OBSTETRICS AND GYNECOLOGY SERVICES	80
PEDIATRIC SERVICES	81
NEUROPSYCHIATRIC SERVICES	83
DISPENSARY SERVICES	85
CONSULTATION SERVICES	87
QUALITY CONTROL	88
RECOMMENDATIONS	89
4.4 ADMINISTRATIVE SERVICES AND HEALTH RECORDS	94
ADMINISTRATIVE SERVICES	94
HEALTH RECORDS	97
RECOMMENDATIONS	99

1. INTRODUCTION

The Westinghouse Systems Analysis Study Towards a "New Generation" of Military Hospitals (NGMH) has been performed to identify and describe potential improvements in facilities, resources, and programs of the Base Level Health Care (BLHC) Systems operated by the Department of Defense for 10 million eligible military on active duty or retired, their dependents, and dependents of deceased military personnel.

This study is Phase I of an ongoing development effort. The objectives of the Westinghouse Phase I effort were:

- to mobilize health care resources for maximum effectiveness and efficiency
- to minimize system life cycle costs, including operating and capital expenditures
- to enable the System to respond to changes in technology, health care trends, and mission or policy.

Phase II will implement Phase I concepts and develop other promising system improvements. Continuing effort through Phase II and beyond will lead to a New Generation of Military Hospitals.

SCOPE OF THE STUDY

The scope of Phase I of the NGMH study was the performance of systems analyses toward improving the construction, planning, maintenance, and training efficiency of the individual BLHC System while maintaining or improving the quality of patient care. A BLHC System is defined as the facilities and resources necessary to provide a full range of health care services to the components of the military community, armed forces personnel, their dependents, and other authorized categories residing on, adjacent to, or referred to the system. It will also provide designated health care services and military

command and control responsibilities to health care facilities beyond its established boundary. (These are considered external demands upon the BLHC System.)

The basic mission of the BLHC System is to:

- Maintain the physical, mental, and operational fitness of the assigned population
- Prevent and control the incidence of disease and injuries within the BLHC System

The services provided by a Base Level Health Care System include:

- General short-term hospital beds with related diagnostic and therapeutic capability
- Inpatient and outpatient clinics
- General and preventive dentistry
- Dispensary care
- Aerospace and aviation medicine
- Preventive medicine
- Mental and social health care
- Veterinary medicine

The external demands that are placed upon the BLHC System can be defined as:

- The treatment of battle casualties
- The designation as a medical and dental specialty treatment center
- Area medical materiel management responsibility
- Area medical command and control responsibility
- Intransit aeromedical evacuation facilities.

Phase I was divided into three basic activities:

- Operations analysis
- Improvement analysis
- Results and recommendations

The operations analysis described the performance of individual BLHCS, elements, functions, and sub-systems. It investigated and documented major functional costs, and it characterized the basic flows between functions.

The DoD selected three specific BLHC Systems for Westinghouse to study in depth and six BLHC Systems for general examination. The Systems were a representative sample of base missions and health care services.

The hospitals selected for in-depth study were:

280-Beds	Beaufort Naval Hospital, Beaufort, South Carolina
350-Beds	Malcolm Grow USAF Hospital, Andrews AFB, Maryland
900-Beds	Walson Army Hospital, Fort Dix, New Jersey

The hospitals selected for general examination and evaluation were:

175-Beds	USAF Hospital, March Air Force Base, California
250-Beds	U.S. Army Hospital, Fort Belvoir, Virginia
400-Beds	U.S. Naval Hospital, Jacksonville, Florida
500-Beds	U.S. Army Hospital, Fort Bragg, North Carolina
750-Beds	U.S. Air Force Hospital, Lackland AFB, Texas
650-Beds	U.S. Naval Hospital, Oakland, California

The improvements analysis assessed major improvement alternatives in terms of technology and its state of development, its impact on hospital management and organization, and its impact on BLHC organization and functions. Other considerations were: additional research and development required, the levels of uncertainty associated with possible alternatives, and policy issues raised by them. The improvement alternatives were submitted to a systems analysis and appropriately tested and evaluated. Cost/benefit studies on major improvement alternatives helped develop specifications and requirements for all recommended improvements.

Recommendations are made, in this Executive Summary and in appropriate volumes, first for construction of a prototype starting in mid-1972 and second, for long-term research and development in the 1975-1980 time frame.

THE WESTINGHOUSE APPROACH

Using a multidisciplinary approach, Westinghouse formed a Consortium of companies and individual professionals from the research, engineering, architecture, industry, management sciences, medicine, nursing, hospital administration, and health law fields. In a sense, only a multidisciplinary systems approach could be successful, since from the outset it was apparent that military hospitals are elaborate and complex systems which blend the "hard" sciences of engineering and construction with the "soft" sciences of medicine and health care.

The objective of the systems approach was to provide a total conceptual framework to accommodate both quantitative analysis and subjective evaluation. Many areas of the systems analysis required the highest level of judgment and experience from the professional specialists in the Consortium. The study's success can be directly traced to workable evaluations of the many qualitative factors that are integral to any health care system. Wherever possible, Westinghouse has identified in this report the areas where qualitative factors are important and how these factors relate to the analysis.

Six major tasks were defined in the Westinghouse proposal.

1. Pre-project Planning -- Westinghouse-funded effort to acquaint the Consortium with the military BLHC System and initiation of the state-of-the-art survey (SOA).
2. Preliminary Data Inventory -- the analysis of the data pack supplied by DoD.
3. Data Inventory -- detailed data collection and observation in nine military BLHC Systems.
4. Systems Analysis -- identification of alternative improvement possibilities and the detailed justification and comparison of these alternatives both individually and in combination.

5. Systems Design -- development of design plans for the circa 1972 military BLHC Systems and identification of R&D programs which will make contributions to the military BLHC System circa 1975-1980.

6. Presentations and Reports -- preparation of the findings of this 12-month study.

Figure 1 graphically describes the process and the interrelationships of all the study tasks within the systems analysis framework. As the model indicates, data gathering activities represented the major allocation of total study resources.

The initial project tasks, the assembly of a broad range of data on the present BLHC System, were required for a characterization of the military BLHC environment as it actually exists rather than as it is understood to exist. And throughout the study, this data intensive approach has left the audit trails vital to future productive efforts.

The BLHC System can be characterized as a comprehensive health care system. While it may have some elements of a specialty or regional referral system, it always provides a broad array of primary and short-term acute health care. In this sense it differs from most civilian community systems with their pattern of local private physicians' offices, group practices, and multi-specialty clinics which are coupled with small community and large regional hospital centers.

Compared to a civilian system, the military system is much more susceptible to change and growth; mission changes which alter the population mix or cause extreme demands for growth are common and have been generally unpredictable.

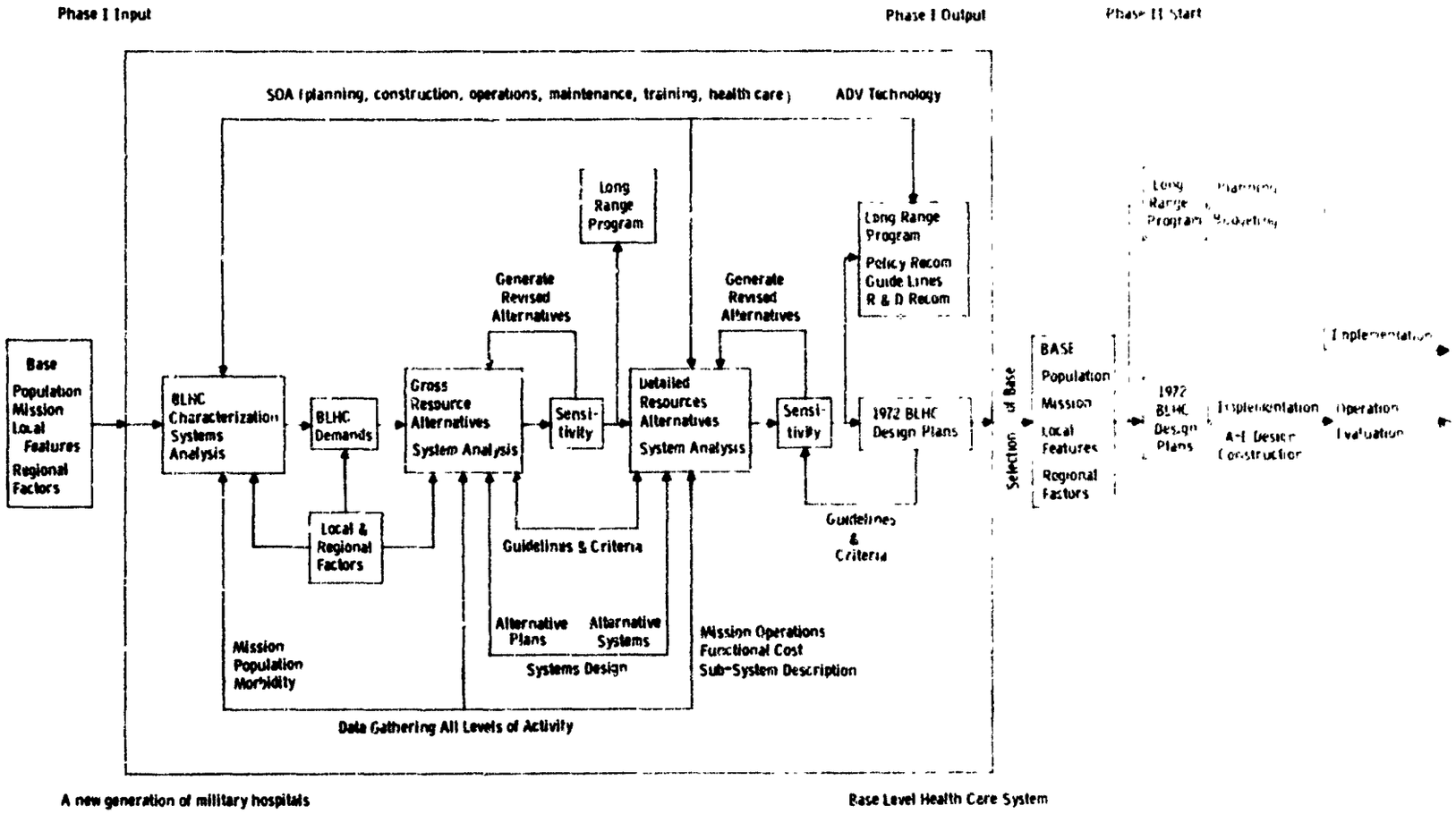

FIGURE 1: HEALTH CARE SYSTEMS MODEL
SHOWING PROCESSES AND INTERRELATIONSHIPS OF ALL STUDY TASKS WITHIN THE SYSTEMS ANALYSIS FRAMEWORK

STUDY CONSTRAINTS

Several constraints were imposed by the Department of Defense on the conduct of this Phase I study, A Systems Analysis Study Towards a "New Generation" of Military Hospitals. These constraints were:

- Alternative systems designs should be developed to serve military base communities with the DoD specified hospital capacities of:

Beneficiary Populations	Beds	Outpatient Visits per Year
40,000 - 50,000	250	300,000
60,000 - 80,000	500	450,000
80,000 - 100,000	750	650,000

- Studies should be limited to services provided at only the base level, i.e. primary hospital plus associated health facilities and dispensaries.
- Regionalization concepts above the base level should not be investigated.
- Disaster planning for natural disasters or mass evacuations should not be included.
- The alternative systems design will not assume relationships for shared services between the Base Level Health Care System and contiguous civilian or other non-DoD related health care facilities.
- The proposed systems concepts must comply with the appropriate governmental and non-governmental agencies regulations and policies pertaining to legal, professional and institutional considerations . . . such laws and regulations should be identified as constraints but should not be limiting in the development of proposals for new and improved operating procedures.

PROBLEM IDENTIFICATION

The fundamental fact which emerged from the study was the uniqueness of each individual BLHC System. Every System has different demands and performance requirements. Based upon that understanding, need for improvement became apparent in three basic areas of the system -- in planning, facilities design, and operations.

1. In planning, a need for a better method of predicting the changing demands a BLHC System must satisfy over its life cycle. Traditional planning methods had too often led to understated resource requirements and unmet health care needs. Needed was a tool to forecast health care requirements at various times in the future, a tool which would also convert those forecasts into specifications of the health care resources required.
2. In facilities design, a need for a system design concept which can respond to health care needs not only initially, but after significant changes and substantial growth. Present designs can rarely absorb rearrangements or modifications in response to new technology nor can they absorb the sometimes abrupt, and often large, expansions required by mission changes. The results have been facilities used in ways that were not intended, and costly modifications and expansions after systems had reached a point of saturation.
3. In operations, a need for resource management and for evaluating the array of sub-system or functional improvement opportunities (such as communications or dietary systems) which are already operational, or which are likely to be in the near future. An extension

of this need for evaluating sub-system alternatives was a method or framework for bringing the many alternatives together in the best combination for the optimal working of the system over its life cycle.

The primary focus was on providing a comprehensive approach for the overall system and sub-systems, with the knowledge that detailed problems can only be resolved within a sound overall framework.

RESULTS AND CONCLUSIONS

The study yields are presented in the following five areas:

1. A massive data resource on health systems in general and on the BLHC System in particular.
2. A demand model -- a method for translating BLHCS beneficiary population data into a statement of the health care required for those populations.
3. A design concept -- a facility organization that will provide a framework for operations and for change and growth over the life cycle.
4. Cost/benefit analyses on major health systems functional areas such as communications, dietary, and materiel handling.
5. Recommendations on medical care.

None of these yields is separate; to some extent they describe the process of the entire study, the path the Westinghouse group took in learning, conceptualizing, analyzing, and testing. Nor are they necessarily in sequence; they are sometimes parallel, often interactive. They are presented separately to dramatize the fact that the sequence

described -- planning, design, and operations -- can be performed over a period of time by different groups. The improvements and tools can be implemented and evaluated in toto or individually. And the careful audit trails provide continuing growth and development of all study yields.

The objectives described in the RFQ and Westinghouse commitments made in its proposal have been met, and more. In several instances during the study, Westinghouse has even contributed the use of proprietary software programs and other Corporate resources to further study goals.

The yields from the study meet the three categories of needs previously described with pragmatic and effective solutions.

- The responsive Westinghouse concepts for the NGMH can accommodate new ideas, changes in policy, changes in health care trends, as well as identified performance requirements.
- Planning and design tools developed are generalized solutions adaptable to any BLHC System. These concepts can respond to the uniqueness of every BLHC System.
- Planning and design tools can reduce the time between planning and occupancy.
- These concepts are not confined to the BLHC System; they will also be widely applicable by HEW, civilian hospitals, and the Veterans Administration.
- Many of these study results are not limited to new facilities, but have immediate appli-

cation to retrofit situations both inside and outside the BLHC System.

- Individual operations analyses have produced viable recommendations for the major subsystem areas.
- Medical care recommendations have balanced and guided engineering outputs throughout the study.

2. RECOMMENDATIONS

The recommendations resulting from the successful completion of the Department of Defense Phase I study — Systems Analysis Study Towards a "New Generation" of Military Hospitals, are summarized as follows:

	Source
• Proceed with Phase II implementing and evaluating the results of Phase I. The DoD should regard Phase II as a comprehensive and continuing R&D program, managed through planning, design and operations as a single and consistent process, without discontinuities in time and responsibilities. The same interdisciplinary approach which has proved successful in Phase I should be employed.	Volume I pg. 9
• DoD should establish a full-time interdisciplinary group to participate with industry in Phase II. This DoD group would be the new cadre of health care system planners who will become the core group for a larger staff necessary for the design, construction and operation of the "New Generation" of military hospitals.	

The following recommendations have immediate applicability in all DoD existing facilities and should also be incorporated in the "New Generation" of military hospitals. These recommendations do not require Research and Development (R&D) efforts for implementation.

	Source
• Military careers should be made more attractive and competitive with civilian opportunities by expanding continuing education programs using self-instructional and multimedia aids, and provide opportunities for attending professional meetings and short courses, and developing a peer audit review system with assistance from the Joint Conference Committee of the American Medical Association.	Volume II pp. 3.3-150 to 172 Volume III pp. 33 to 54 Volume IV pp. 3-201 to 218
• Utilize a manual materiel handling system with exchange cart; the automated Power and Free materiel handling system should be considered for 200-300 and 700 to 800 bed BLHC Systems.	Volume II pp. 3.3-34 to 52 Volume IV pp. 3.232 to 252
• Large-cross-section pneumatic tubes should be installed to accommodate high-volume, high-frequency trash and soiled linen removal.	
• Investigate the use of automatic dumbwaiters for limited use in high-volume, high-frequency, non-level workload areas such as conventional dietary systems.	
• A combination of convenience foods and abbreviated kitchen for each nursing unit should be adopted; revise staffing and design criteria to allow for BLHC System-wide application.	Volume II pp. 3.3-53 to 68 Volume IV pp. 3-180 to 200

	Source
• Standardize clinical laboratory test procedures and equipment for more precise internal management and generation of more usable data for prediction of workload.	Volume II pp. 3.3-69 to 86 Volume IV pp. 3-37 to 57
• Automated clinical laboratory equipment costing over $35,000 should be leased and not purchased.	
• Utilize a staffing criteria to allow a ratio of one dentist to four assistants to three operatories.	
• Expand the practice of four-handed sit-down dentistry.	Volume II pp. 3.3-87 to 100 Volume IV pp. 3-160 to 179
• Increase the use of dental hygienists in preventive dental programs such as dental prophylaxis, fluoride treatments, water-supply fluoridation, and patient education on prevention of dental disorders.	
• Institute "outpatient surgery" as an integral part of the composite facility -- utilizing existing operating room suites, personnel and ancillary services.	Volume II pp. 3.3-101 to 110 Volume IV pp. 3-1 to 36

	Source
• Level the nursing workload by rescheduling from the peak morning hours of 0700 to 1000 procedures such as: Inpatient movement to ancillary areas Admissions/discharges Bed baths	Volume II pp. 3.3-111 to 149
• Employ the unit dose drug distribution with IV additive and Auxiliary Clinical Pharmacist for both inpatient and outpatient operations for all BLHC Systems of 200 beds or more. • Introduce a drug information center for 750- to 1000- bed BLHC Systems.	Volume II 3.3-173 to 190 Volume IV pp. 3-264 to 281
• Utilize the double corridor concept for improved staff and patient traffic patterns in Radiology Departments. • Generators equipped to serve several X-ray machines should be used rather than the existing use of one generator to one X-ray machine.	Volume II pp. 3.3-191 to 206 Volume IV pp. 3-307 to 324

The following recommendations for Short-Term R&D, that is research and development programs that can be completed in less than eighteen months, have been identified by Westinghouse.

	Source
• The data base for the Demand Model should be immediately extended and refined to show ancillary usage by level of dependency and by specialty clinic visit. The Demand Model's capabilities depend upon the quality and range of available data; this requires that the data and the Model itself be adjusted and updated on an ongoing basis. The Phase I study developed data to enable immediate application of the Demand Model.	Volume II pp. 3.1-1 to 60
• Investigate the implications of the Westinghouse Phase I study yields for BLHC Systems smaller than 250 beds and for specialty or regional referral centers.	
• Revise existing guidelines and criteria for planning, design, construction and staffing to facilitate incorporation of the various technological options and improvement alternatives into design specifications for the "New Generation" of military hospitals.	Volume II pp. 3.4-1 to 84

	Source
• Investigate initial installation of a central dedicated processor with time-sharing capability having the essential features of: - central processor dedicated to the NGMH system - time-sharing by functions - commonly shared data base with a natural language interface - cathode ray tube for basic input/output media with limited hard copy capability. • Develop specifications for the use of microfilm for the production, storage, and retrieval of such data as medical records, admission, medical summaries and boards and its applicability to BLHC Systems.	Volume II 3.3-12 to 33 Volume IV pp. 3-58 to 126
• Determine the economic break-even point for dietary disposables and evaluate the consequent impact of disposables on the materiel handling system. • Develop specifications for computerized menu planning for more economical purchasing and inventory control procedures.	Volume II pp. 3.3-53 to 68 Volume IV pp. 3-180 to 200
• Develop a computerized, centralized and standardized data-collection system for major elements in the Base Level Health Care System.	Volume III pp. 94 to 101

	Source
• Develop specifications for computerized central appointment systems for clinics and outpatient services which can handle rescheduling, cancellations, and other varying demands upon the system while allowing flexibility for individual clinics.	Volume III pp. 94 to 101
• Provide audio-visual referral communications centers between BLHCS, dispensaries and University Medical Centers for consultation, to reduce the estimated fifty percent of hospital referrals, and to promptly alert hospital staff to the details of more acute problems and permit more rapid communication of health care data.	Volume III pp. 55 to 69
• Implement computerized techniques including automated testing procedures, terminals for laboratory result readout in nursing stations, outpatient departments, remote facilities, communications systems with hospital decision-making centers, disease detection systems, and quality control for the Clinical Laboratories.	Volume II pp. 3.3-69 to 86 Volume III pp. 55 to 69
• Develop specifications for communications equipment for the Clinical Laboratory which can effect adequate and low-cost image storage and retrieval.	Volume II pp. 3.3-69 to 86

	Source
• Establish an innovative position of "Barracks Health Master" with training in preventive medicine including communicable disease, safety, and trauma prevention. These corpsmen on the staff of the drill instructor, would be stationed in the barracks of recruit training centers to function with appropriate responsibility and authority. Such a position would reduce visits to dispensaries and outpatient clinics by recruits.	Volume III pp. 33 to 54
• Adopt the Physician's Assistant concept for all outpatient clinics in new BLHC Systems; utilize the Corpsman Physicians Assistant for clinics with predominate male patients and the Nurse Practitioner for clinics with predominate female patients.	
• Reevaluate and revise outpatient clinic staffing and space planning criteria to allow for: - Operation of most clinics twelve hours per day, five days per week. - Provide two examining rooms per physician for most clinics. - Provide office space for physicians outside the clinic. - Meeting needs for patient-family education and counseling, including use of multimedia aids.	Volume II pp. 3.3-101 to 110 Volume III pp. 55 to 69
• Establish and computerize the Westinghouse "Graduate staffing" procedure to enable Nursing Service to vary unit staff on a daily basis as workload varies.	Volume II pp. 3.3-111 to 149 Volume IV pp. 3-337 to 360

	Source
• Adopt the Modified Nursing Specialist - Unit Manager organization.	Volume II pp. 3.3-111 to 149 Volume IV pp. 3-337 to 360
• Develop specifications for an education and training concept employing integrated Media -- a combination of electronic dial access and instructional program management information and control; evaluate the feasibility of installing this system in existing BLHC Systems.	Volume II pp. 3.3-150 to 172 Volume IV pp. 3.201 to 218
• Evaluate the applicability of the Radiology "Cluster Room" concept to military hospitals.	Volume II pp. 3.3-191 to 206 Volume IV pp. 3.307 to 324

The following recommendations for Long-Term R&D, that is research and development programs that require more than eighteen months of effort before completion of the program, have been identified by Westinghouse.

• Develop nursing procedure time values by type of patient, level of patient dependency and type of nursing skill required.	Volume II pp. 3.3-111 to 149
• Develop a uniform and comprehensive reporting procedure for all DoD health care services. Among the major findings of the Westinghouse Phase I study were the variety, inconsistency, and inadequacy of existing data and data reporting systems. Variations between service branches are common: inconsistencies occur between services and, within services, between individual hospitals; and data reported are tied to "functional costs" rather than performance requirements.	Volume II pp. 3.1-1 to 58 Volume V pg. 3-1

	Source
• Implement programs to develop automated hospital information hardware and software systems defined by specifications established in the Short Term R&D programs.	Volume II pp. 3.3-12 to 33
• In the area of construction planning, Westinghouse recommends that the DoD develop specific user needs for industrialized building systems, and components throughout BLHC Systems.	Volume II pp. 3.4-1 to 97
• Explore the development of a worldwide health data bank to permit complete assessments of health care trends, the development of preventive medical programs, and to determine health needs and costs on a much more accurate and efficient basis than currently possible. This might be developed jointly by the military services and the Veterans Administration.	Volume III pp. 94 to 101

In summary, Phase I has not only produced tools that have the capability and flexibility for the complete spectrum of DoD hospitals under consideration, but these tools extend the Westinghouse results to far broader applications, such as retrofit situations.

The many existing BLHC Systems offer a myriad of opportunities for implementation of the results of this systems analysis program. Such retrofits need not wait for the full scale Phase II application for the DoD to realize substantial benefits in time, dollars, and better sub-system operations.

The implications of this study will extend beyond the DoD. As one of the world's largest comprehensive medical health care programs, the DoD BLHC Systems can become a model for large health care systems everywhere.

3. STUDY PROTOCOL

BACKGROUND

One of the major objectives of this study, stated in both the RFQ and the Westinghouse proposal, is "...improving the operating efficiency of the individual military hospital, which includes inpatient and outpatient responsibilities, while maintaining or improving the quality of patient care...." The Westinghouse Study Team realized that engineering expertise per se would not be adequate to judge the compatibility, acceptability, and quality of medical practices. As a major part of the system's analysis of the BLHC System, therefore, a Medical Health Care Review Team, composed of physicians, nurses, dentists, and hospital administrators, was assigned to study the three primary BLHC Systems. Their charge was to make recommendations on medical and nursing practices based on their observations and interviews and on their professional experience.

This study is primarily a qualitative review rather than an in-depth study. Recommendations are based on the Medical Health Care Review Team's professional interpretation of the System in their brief, but intensive, observation of selected facilities and interviews with health personnel. These recommendations clearly highlight the complexity of the demands upon the System as well as some of the medical factors which will have impact upon the design, construction, and operation of the NGMH.

Since the Civil War era, military medical services have been both innovative and progressive. Military medical activities in supplying health care have become legend with such achievements as the Letterman System of Progressive Casualty Care and the establishment of priorities of sorting mass casualties. In addition, military physicians have pioneered in the development of pathology registries; a world-wide environmental research program; studies in shock therapy; the search for blood substitutes; and

preventive progressive medical programs which have resulted in effective tetanus prophylaxis. More recently air evacuation services to continental U.S. and rehabilitation programs are significantly reducing morbidity. The elevation of health technicians (corpsmen) to active participation in medical care has been adopted in the civilian section. Such programs have made American military medical care the prototype of military and civilian health systems throughout the world.

In the past two decades, civilian professional medical care in America has also progressed rapidly, generating more services and more sophisticated diagnostic and therapeutic advances than in the preceding several hundred years.

Unfortunately, for a variety of reasons which will be discussed in this report, the effectiveness of the military medical system hinges on many uncertainties. It depends upon an involuntary draft of physicians and also a large civilian consulting force. Probably the most serious and obvious problem arising from this draft of health care personnel is the rapid turnover of physicians and other key supporting professionals such as nurses and technical corpsmen.

In recent years, dependents and retirees have increased so that eligible dependents and retirees now exceed all active duty Armed Forces personnel. Expanded medical care for this sector has injected into the Military Health Care System the compelling demands of a modified comprehensive health care practice. Family clinics and services for retirees have created a system which now provides beneficiary services and utilizes sophisticated and expensive diagnostic, therapeutic, and consulting services. Dependents and retirees, therefore, place the heaviest burdens on the System; military personnel, by contrast, benefit from an effective preventive medicine program within the military system, and when hospitalized, are often quickly ambulatory. The focus of military medicine then, has shifted from an orientation primarily directed towards young healthy

males to one confronted increasingly with the ills of children, wives, and people in the geriatric age group.

A most important trend in the last two decades has been the development of outpatient clinics and ambulatory health services. Such clinics help the military to meet the crisis needs of the dependent and retiree population and reduce demands upon inpatient hospital services.

To help meet this demand, a partial pay program, the Civilian Health and Medical Program of the Uniformed Services, (CHAMPUS), was enacted in 1966 as a third party health program to ensure quality care for dependents of active duty personnel, and retirees and their dependents. Although this program has problems in defining all the health care services it supports, it provides drugs and care outside the hospital, as well as special long term care for the handicapped, retarded, or chronically ill.

Designed to complement existing military medical programs, it has made its greatest contribution in providing health care in locations where services were not previously available. In 1968, CHAMPUS provided about thirty-five percent of all inpatient services and ten percent of the outpatient care for dependents. Approximately one-half of the outpatient care is for psychiatric services. In 1960, there were 360,000 hospital admissions under CHAMPUS, of which 80 percent were for dependents of active duty personnel and retirees.*

The breakdown of patients utilizing CHAMPUS services (using the International Classification of Disease Adapted system) is; 48 percent relate to labor and delivery or pregnancy, 14 percent to respiratory diseases, eight percent to urogenital problems, and six percent to digestive diseases. For retirees, digestive diseases are the principal complaints, with circulatory disease second, and mental or psychiatric problems third. For the dependents of retirees, respiratory disease, genitourinary complaints, and

*CHAMPUS 12th Annual Report, 1969 (Calendar Year 1968)

digestive problems, each represented 13 percent of admissions; pregnancy and psychiatric conditions, each represented ten percent of admissions. During Fiscal Year 1969, programs for the handicapped, chronic conditions, and nervous or emotional disorders, a potentially expensive area of services, represented only 12 percent of the total cost of $160,458,000 of CHAMPUS activities.* Because CHAMPUS provides so many civilian health care services to dependents, these services are unlikely ever to be eliminated, and in fact, they will undoubtedly be reinforced by a Federally sponsored compulsory health insurance program, if and when it evolves.

It is estimated that if current professional BLHCS services** are increased 50 percent, Military Health Care Services in the new generation could continue supporting about 85 percent of the inpatient care demands and possibly 90 percent of outpatient demands. Although the costs for purely military supplied services is less than that in the civilian community, providing the resources to give complete dependent care in military facilities appears attractive.

Care areas which the current Military Health Care System cannot support at the BLHCS facilities surveyed include cardiovascular surgery, certain types of pediatric surgery (congenital defects, orthopedic problems), and psychiatric disorders. Demands in these could be referred to the next echelon of medical care in the military system, the "center." However, the freedom to choose physician and hospital permitted under CHAMPUS means that dependents and retirees may refer to the civilian system.

SCOPE OF STUDY

In this phase of the study, the Medical Health Care Review Team focused on the following factors relating to medical practices: (1) methods to attract, upgrade, and hold professional medical personnel (including training, staffing patterns, responsibilities and utilization, career development, and specific duties), (2) the ways in which facilities, equipment, and

*CHAMPUS 12th Annual Report, 1969 (Calendar Year 1968).

**All Beneficiary Categories.

space allocations interface with viable medical practices, and (3) how the professional and administrative services must be considered in planning for the new generation.

The findings of the Health Care Review Team were to interface with the investigations of the Westinghouse study teams at two points: (1) within the first several months to indicate current practices which the systems analysts and designers should be studying and analyzing; (2) during the latter months ensure that the design and operational recommendations were both acceptable and feasible to professional health care personnel.

STUDY APPROACH

The primary charge of the Medical Health Care Team was to review the effectiveness of health care delivery through structured interviews and observations during three-day visits to each of three primary study hospitals assigned by DoD. As a result of this study, the Team was to make recommendations that would:

(1) Identify unmet health care needs

(2) Serve as a critical filter, observing and critiquing the present BLHC System to provide Westinghouse analysts and designers with a basis for selecting areas to study in greater depth for the most impact

(3) Ensure that Study Team recommendations are compatible with good medical practice.

The Team's assignment included: study of the quantity, quality, comprehensiveness, and effectiveness of diagnostic, laboratory, and therapeutic equipment and procedures; a determination of the adequacy of health examinations, diagnoses, and treatment; an evaluation of preventive care programs; an assessment of the availability of medical services to the population concerned; and a report on discharge planning programs and the subsequent use of ancillary outpatient clinics.

The Team was also to review facility records; assess current standards of hospital medical care; review and/or develop guidelines for training corpsmen and technicians; perform a job satisfaction study in terms of the style of manage-

ment, promotion, remuneration, staff effectiveness, and quality of patient care; and assess administrative problems.

In addition to determining current and effective health practices, the Study Group was also charged with devising and directing innovative thinking towards the improvement of the New Generation of Military Hospitals.

The Medical Health Care Review Team held a series of organizational meetings to outline and specify the required data to be collected at the military health facilities. The Team identified specific information to be collected by the system engineers. Combined with the data pack material supplied by DoD from each of the three hospitals, this information was to provide background for the in-depth data collection activities by all project teams. The data pack information, however, was very limited and inconsistent from hospital to hospital.

Using the survey form as a guide, Team members tried to determine the current practice of medical and health services in the three principal areas of operation (military dispensaries, hospital clinics, and inpatient services) via in-depth interviews with as many physicians, nurses, and health personnel as possible during each of the three-day visits. During the interviews, performance problems in current organization, equipment, facilities, and services were itemized in terms of both current operation and possible expansion; those elements of the System or operation that should be retained, modified, or replaced were noted.

A three-day visit to each of the three primary facilities in November and December of 1969 produced a total of 134 interviews with physicians, nurses, corpsmen, medical service corps officers, and patients. The Team held organizational meetings in January and February to discuss findings and to begin preparation of the final report. Throughout the study, regular communication between the Westinghouse engineers, systems analysts, and members of the Medical Health Care Study Team ensured the compatibility of engineering recommendations with

good medical practice.

Study Limitations

Major study limitations were the time consuming nature of the interviews and the need to determine the reliability and value of collected data. The Team's recommendations and suggestions represent a consensus based on professional evaluation of observations and on data collected during on-site visits as well as peripheral, unofficial information accumulated during the study. The Health Care Study Team had no access to cumulative health data comparable to civilian service activities reports.

Superior medical care within military hospitals, as with any health system, is dependent upon the effectiveness of certain basic elements such as (1) a high caliber professional and administrative staff; (2) appropriate and well-equipped facilities; and (3) efficient institutional practices. How well these elements function in combination is difficult, if not impossible, to quantitatively assess within the scope of this study.

Qualitative measures of health care can be attempted from several viewpoints: the technologic expertise of physicians, the organizational acumen of hospital administrators, the scope of services offered, and methods of "in house" professional auditing. The measure of success, however, must come from how effectively the System rehabilitates the patient, although such recoveries may be equally difficult to assess in the military setting.

In the military system, the service man or his dependents often measure the success of health care in a fairly pragmatic fashion. They are concerned with prompt attention, an understandable diagnosis, and "non-military" relationships with the physicians from whom they expect a modicum of sympathy and concern.

Performance Criteria

Standards or criteria of acceptable performance for health care have evolved slowly. Over the last two decades, the accreditation process of the Joint Commission on Accreditation has stimulated many "voluntary improvements" in health services, principally by emphasizing the minimum, rather than the optimum, in performance of medical care. Other measurements of quality have resulted from efforts by specialty organizations such as the American College of Surgeons, the American Heart Association's work on hospital emergency departments, and the attention of the American Medical Association, the National Research Council, and the Department of Transportation (Highway Safety Act) on Emergency Medical and Health Services. The fact remains that no one standard exists against which to measure the quality of health care.

Areas of Assessment

Because of the limitations of three-day visits, the Team could not assess in-depth the complete medical and health care provided at any single health facility. The Medical Health Care Team, therefore, selected critical areas to discuss with chiefs of services and other personnel at the assigned military installations. They also reviewed charts and toured the hospital and service areas.

Four principal elements were considered: (1) the role and quality of personnel; (2) the facilities; (3) the professional services including basic medical services and quality control, and (4) administrative service. With emphasis on these areas, the Team's basic approach was to study and evaluate as many critical elements in the health facility which directly or indirectly affected professional services.

The resulting Team recommendations and suggestions can be measured against one of the following objectives:

(1) Upgrade and utilize personnel more efficiently while providing the same quality of care and decision making.

(2) Permit maximum flexibility in adjusting to new service demands.

The remainder of this report details the observations in the four principal areas mentioned above and the resulting Team recommendations and suggestions.

TEAM COMPOSITION

The Medical Health Care Team consisted of seven physicians, a dentist, two registered nurses with doctorates, and a hospital administrator.

F. C. Jackson, M.D.	Team Captain; Chief Surgical Services, V.A. Hospital, Pittsburgh and Professor of Surgery, University of Pittsburgh
R. A. Chez, M.D.	Professor, Obstetrics and Gynecology, and Associate Dean, University of Pittsburgh School of Medicine
T. B. Fitzpatrick, M.S.	Associate Professor, University of Pittsburgh, Graduate School of Public Health
W. A. George, D.D.S.	Associate Dean, University of Pittsburgh, College of Dentistry
M. F. Hill, R.N., Ph.D.	Associate Professor of Nursing Administration, University of Pittsburgh, School of Nursing
H. W. Kroeger, M.D.	Director, Medical and Hospital Administration, University of Pittsburgh, Graduate School of Public Health
J. W. Love, Ph.D., M.D.	Chief, Division of Thoracic and Cardiovascular Surgery, Baltimore City Hospitals and Surgeon, The Johns Hopkins Hospital
F. D. W. Lukens, M.D.	Chief of Staff, V.A. Hospital, Pittsburgh and Professor of Medicine, University of Pittsburgh

I. T. Ramey, R.N., Ph.D.	Chairman, Department of Medical - Surgical Nursing, University of Pittsburgh, School of Nursing
C. T. Rumble, Jr. M.D.	Adjunct Assistant Professor, Community Mental Health, and Clinical Instructor in Psychiatry, University of Pittsburgh and Private Practice in Psychiatry
E. W. Saitz, M.D.	Assistant Professor of Pediatrics, University of Pittsburgh, School of Medicine and Assistant Director, Outpatient Department, Children's Hospital of Pittsburgh

4. PRESENTATION OF RESULTS

4.1 OBSERVATIONS ON PERSONNEL

Information on health care personnel gathered by the Team through observation and interviews at the three primary BLHC Systems is summarized in this section. While abundant data were collected, only those relevant to the "New Generation" Military Hospital (NGMH) will be reported.

Military and civilian hospitals* share many personnel problems such as shortages of professional personnel, inadequate training and education programs, and difficulties in keeping abreast of today's rapid technological changes. However, because of several basic differences between the military and civilian systems, certain problems are more severe for military hospitals than for their civilian counterparts. The most recurrent are the very high personnel turnover and the resulting disruptive fluctuations in the amount and types of services available at any specific time. Reasons for these differences include:

- Military health facilities are administered by the military command which extends to all operational practices within military hospitals and dispensaries.
- The military physician manpower strength and the supportive staffs are essentially maintained by the draft law enacted and renewed by Congress. In addition to transient personnel and the high turnover rate, health care personnel are often transferred to meet service-wide demands rather than local requirements.
- Salary scales and other benefits for professional personnel are generally below those provided for the civilian counterpart although certain inducements (retirement program, social club facilities, and "sign-over" bonuses) provide some compensation for salary deficiencies.
- Professional staffs are required by military practice to assume specific professional and administrative duties (such as Chief of a

---

* A civilian hospital is defined as a comprehensive health care system (community hospital) of equal size to the military hospital being compared.

Dispensary, Ship or Battalion Surgeon) which may dilute their professional effectiveness.

- Most professional or administrative leadership is generated from the corps of career (versus reserve or draftee) physicians. This tends to slow changes in approaches to health care, since an infusion of non-service appointments does not occur at the various levels of professional or administrative responsibility.

The need to attract and hold highly skilled professional personnel on all levels is probably the paramount requirement for the NGMH, and this problem will increase as competition for trained professional health care personnel intensifies from the civilian sector.

The military must continue to broaden the spectrum of services to provide adequate health care for them and to parallel those in civilian hospitals. Such changes are necessary because the military system is handling increasing numbers of non-military beneficiaries, from young dependents to active duty personnel to older retirees.

Although a variety of topics was investigated, including staffing, assignment patterns, training programs, preparation for service responsibilities, and career development, many problems were related to motivating and retaining personnel. This chapter contains the Team's reports on interviews with physicians, nurses, and corpsmen. Although other allied health professionals play active roles in the facilities visited, the Team did not review their activities completely. However, pertinent peripheral comments and observations regarding these specialities are included.

PHYSICIANS

The military physician in 1970, together with his predominate civilian reservist medical corps is capable of providing services equal to the best civilian health care. In practice, however, he is hampered by the sometimes inflexible military system.

The majority of Chiefs of Services observed by the Medical Team were well-trained and Board Certified. They seemed dedicated to the Service, innovative and were trying to meet all the demands made of them. The majority of younger staff members had completed their residencies.

The overall number of physicians in the military services seemed to be sufficient within specialties; however, rosters varied from hospital to hospital and service to service, particularly in scarce specialty disciplines. In one institution visited, the ratio of physicians to population served was 1 to 1100, and in the second hospital the ratio was 1 to 666, twenty-five percent above its assigned ceiling. Some disciplines were represented by only one physician.

Essentially, all hospitals surveyed maintained a core staff representing the following disciplines: (1) medicine (dermatology, cardiology, infectious disease or pulmonary disease, and hematology); (2) surgery (general surgery, orthopedics, urology, ophthalmology, otolaryngology, and anesthesiology); (3) obstetrics and gynecology; (4) pediatrics; (5) physical medicine. Subspecialties including allergy, rheumatology, neurology, gastroenterology, genetics, thoracic surgery, and acute medicine were all represented in one facility recently designated as a "center." While all units had a diagnostic service core of radiology and laboratory sections, none had neurosurgical or plastic surgical services. There are no osteopathic physicians in the hospitals visited. Other special services available within the complex of the hospital dispensary systems included radiotherapy, aero-medical evacuation areas and physical examination surveys (induction-discharge). Two institutions had united psychiatric services.

Length of Service

Ninety percent of the physicians in the BLHCS visited were reservists, with experience ranging from one year of internship to completed residencies. Reservist's assignments at these facilities varies considerably from service to service, depending largely upon military requirements. For example, Air Force assignees usually serve one to two years at the same hospital while in the Army the majority tend to stay one year or less, except in rare special discipline categories.

The remaining ten percent of physicians represent the core of career officers. These officers can be divided into three categories: (1) those with twenty or more years of service and who now serve in a completely administrative capacity or who are Chiefs of Services ; (2) those with less than twenty years of active duty who are fulfilling "in-service" graduate training obligations and remain because they are close to the twenty-year retirement level and (3) those who resign after completing payback.

Assignments

Administrative: Physician assignments are influenced by several factors including military demands, local institutional needs, scarcity of physicians in certain disciplines, or the transfer of reservists in and out of the services. This flux in personnel, in turn, creates assignment changes for the ten percent regular military physicians, often placing the burden of frequent relocations on them. In general, the high turnover of chiefs of services and administrative physicians has discouraged or seriously affected planned growth and development within any individual facility.

Although the regular military medical officers rarely have formal administrative training, some of them fill administrative roles such as Chief of the Service, Commanding Officer, hospital services director, and Executive Officer. They have as supporting staff members Medical Service Corps officers with requisite educational and administrative experience.

Chiefs of clinical services rarely stay longer than two years in one facility. Only if a medical officer was a specialist in a specialized discipline or had achieved a national reputation would he hold a position beyond five years.

Medical and Surgical: Generally, physicians with two or more years of graduate training or board-qualified and/or certified physicians were assigned to appropriate disciplines in the hospital. General Medical Officers, who were not certified, however, tended to be assigned to either dispensaries, one of the

medical or surgical disciplines, or one of the medical or surgical services as on-the-job trainees.

Differences existed between hospitals over the assignments of physicians to wards or bed sections. Most physicians in "in-service" positions are "part-time," with much of their effort expended in outpatient areas. General Medical Officers are frequently assigned solely to a ward or an outpatient department with most being assigned to wards such as obstetrics or pediatrics for dependents. The remainder appeared to be assigned to limited specialties such as orthopedics or a ward requiring limited decision-making. Clinic assignments generally involve the entire staff for individual specialties on clinic days, leaving many physicians with conflicting "double duties" which frequently produced delays (for example, an obstetrician on call in delivery room may also work in the clinic). Staffing patterns generally reflected these heavy outpatient services, particularly in Obstetrics-Gynecology and Pediatrics.

It was not possible to determine how much time physicians spent on all their duties including ward, operating room, clinics, consulting, and writing reports. Nevertheless, more than half their working time seemed to be spent in the outpatient department and in preparing summaries, reports, or Board actions.

Utilization of physicians in the dispensary system was also difficult to determine. Primary time was allocated to sick call, minimally held twice daily. Since more than half of these military patients are screened by corpsmen, the physicians essentially see only patients with acute illness or injury or those who request to see the physician. Dispensary assignments seem to be the most objectionable positions because physicians are removed from the mainstream of hospital medicine. These assignments are generally given to reservists with little or no post-internship training, little familiarity with military health problems, and limited time in service. Where these individuals are also given hospital responsibilities, their role appears to be more effective and their morale higher.

The total physician time devoted to military medicine was in some instances reduced by extra non-military activities, i.e. moonlighting. Reasons for these activities included the need for extra income or to maintain their civilian oriented experience by caring for civilians. Probably no more than twenty percent of the physicians were involved and these were usually reservists or two year men. However, key personnel, such as the only qualified anesthesiologist, occasionally were engaged in extra military activities which reduced their effectiveness.

Another problem was the "lame duck" physician planning to leave within three or four months and usually involved in setting up his new civilian practice. If he holds a key staff position, he may create particular problems since he is away part of the time and his interest is at a low ebb. The "early out" policies, which permit physicians to leave up to several weeks ahead of scheduled departure date, created additional staffing problems. One institution partially compensated for this situation by scheduling reserve medical units at the hospital in July and August, when staffing was likely to be low.

Personnel Shortages

Certain professional services, such as neurosurgery, plastic surgery, psychiatry, elective cardiovascular and thoracic surgery, hand surgery, major tumor surgery, and elective pediatric surgery (particularly for orthopedic problems and congenital defects) are often unavailable because of: (1) a scarcity of these specialists in the civilian,or draft system, (2) limited demand for such services, or (3) military policies regarding the care of certain military problems, such as service-connected injuries. Such care is referred to Regional Centers. Civilian physicians are utilized as consultants in some of these specialties as well as to augment the military physician staff for night duty, week-end clinics, emergency department or acute medicine clinics.

Career Development

The Survey Team found that on-going training and education of military physicians generally received low priority. As a result, some physicians felt they were losing touch with advances in civilian medicine, and many were

worried about loss of professional skills with the paucity of stimulation available. Others, however, felt that military experience contributes breadth and variety to their medical careers. Most hospitals had in-hospital conferences, ward rounds, and meetings with visiting consultants. However, participation in these was reportedly perfunctory rather than enthusiastic.

At the dispensary level, no program existed for professional growth and development or for review. In addition, budgetary limitations and distance limits often placed restrictions on travel to professional meetings.

Only a few clinical research activities were identified in the three institutions visited. These included an attempt to determine the loss of hearing acuity during military service and a clinical assessment of gynecological oncology. This latter study evolved solely through the efforts of an enthusiastic Chief of Obstetrics and Gynecology who had developed a professional reputation in his clinical efforts. In one institution physicians from a nearby university were studying viral infection and meningitis in the recruits.

Career development for military physicians is almost totally tied to the military service promotional system — a system primarily oriented toward command or administrative responsibilities as well as time in service. This career development system leaves many physicians feeling trapped by a gradual senescence of clinical acumen. They must orient themselves toward administration, for once they are promoted, these medical officers have been unable to remain involved in purely clinical work. Unlike their civilian counterparts, no premium is given for the expert clinician, the investigator, or the academician, and, in fact, a general officer rank within the therapeutic health services has in the past been stubbornly resisted. Changes in advancement policies could be very effective in encouraging the clinician to remain in military practice.

Career Advantages and Disadvantages

The obvious advantages of a military career for the physician include excellent residency training programs with a high success rate on board

examinations, a busy practice immediately following training, travel opportunities, and retirement benefits.

There are, however, many disadvantages. Assignments can be unpredictable, with preference given to career men with rank; income is lower than in civilian practice; separations from family occur, often for a year or more; and reassignments can completely disrupt family life, particularly for school-age children.

Although much has been said about the military retirement program, it is no longer competitive with the rewards of civilian practice or building an estate. Civilian income even for the recent graduate far exceeds the financial rewards of a military appointment.

Professional satisfaction can be difficult to achieve if by chance a physician enters the military system at an advanced level.

A further disadvantage for a specialty physician in a scarce discipline category is that he may be quickly overwhelmed with work and the lack of assistants as the director of a "one man" service.

The Medical Survey Team undertook a limited survey to determine the factors which would encourage a physician to remain in the service. The following physician responses, given in order of decreasing frequency reflect many of the problems already discussed. These items already well-known to the DoD are not intended as recommendations, however, since many are inconsistent with the military mission. They do indicate the improvements desired by a small sampling of military physicians.

(1) Greater stability of assignment

(2) Increased pay

(3) Less regimentation, rigidity, and control over personal, non-professional life

(4) Some self-determination of assignment, such as area of country, housing, or duties

(5) Less administrative work or more assistance in providing it

(6) More direct patient treatment time

(7) More professional freedom and educational opportunities

(8) Privilege and opportunity to engage in extra-military medical work (especially if major portion of work is administrative.)

Because of the present draft law, the scarcity of the physician per se is not reflected in the military system. However, the draft law cannot be used indefinitely as the principal recruitment mechanism and the realities of competing for the scarce "physician commodity" must soon be faced.

NURSES

The Survey Team Nursing consultants interviewed not only chief nurses and their assistants, but also ward supervisors, head and staff nurses, corpsmen, wardmasters, and patients to explore such areas as the utilization of nurses, their career development, relationships to other professional groups, and appraisal of patient care. They found that although morale tends to be high among military RN's due to attractive travel, education, and retirement benefits, the general shortage of nurses remains a major problem, compounded by high turnover as a result of marriage and better civilian opportunities.

Assignments

Nurses are usually assigned by a quota system established by personnel and staffing sections in the Office of the Surgeon General and by Surgeons at Command Headquarters. Assignment to a particular hospital is usually short in comparison to established civilian practices. Within assignments, nurses are frequently rotated from service to service, making it difficult for the nurses to provide real leadership in establishing standards of care or even to learn the details of each service. The military nursing staff in two of the hospitals visited numbered only half the total roster of physicians. When necessary, nursing staffs were augmented by civilian nurses. They lent some stability to the nursing staff, although some are service personnel dependents who leave when their spouses are transferred.

Utilization of Personnel

The Team observed that the role of the nurse was often poorly defined, and nurses spent little time planning, administering, or evaluating patient care.

Nursing services generally appeared to be task oriented. Essentially, nurses supervised corpsmen, maintained records, carried out physician's orders too complex for the corpsmen, and provided a variety of non-nursing functions such as housekeeping, clerical, or laboratory services. Corpsmen provided most of the direct care. Few military nurses had speciality training for the position they occupied, and, in fact, when other services were short of personnel, the nurses often filled in.

Most nurses functioned under the nursing department; however, they were occasionally assigned to specific services, such as the Outpatient Department or the OB/GYN Department. The nursing service found these arrangements generally unsatisfactory; it was difficult to rotate or utilize personnel efficiently, and some nurses complained of feeling isolated.

Although most nurses interviewed said they used the team approach to patient care, critically ill patients were generally "case" assigned and a functional approach seemed to be used for most routine work. Individualized patient care varied widely, generally at the discretion of the head nurse. In some wards, standard nursing routines were carried out for all patients, while on other wards, individual care plans were prepared.

Cooperative Relationships

Nursing personnel appeared to have a satisfactory working relationship with other professional groups, although collaborative planning with other professionals and department heads seemed to be initiated by the nurses. Physicians supported nurses in planning special care for acutely ill patients; however, most were short-stay patients requiring routine care and little special planning.

Nurses assigned to the psychiatric and obstetric services appeared to have a closer relationship with other professionals, perhaps because the treatment structure required closer cooperation.

Appraisal of Patient Care Systems

Although each military hospital has policy and procedure manuals to guide personnel, Medical Directors of the various specialties frequently established

routines which supersede these manuals. Since these administrative physicians were frequently reassigned to new posts, changes were constantly being made which not only created confusion among the staff, but also increased the difficulty of appraising the patient-care system.

The Chief Nurses worked closely with some of the Medical Officers in planning, providing, and evaluating patient care. They were also members of committees which appraise medical care such as the Medical and Dental Records Appraisal Committee, the Executive Committee, the Infections Committee, the Therapeutic Agents Committee, the Library Committee, and the Disaster Committee.

While ward rounds with physicians and close cooperation between professional personnel on hospital committees and boards provided an indirect evaluation of nursing services, the nursing service had no formal systematic evaluation of nursing care, particularly at the ward level. Obvious problems such as crusted urethral catheters or the appearance of decubiti on individual patients might be discussed in informal conferences; however, systematic nursing assessments were not made for every patient.

The Team noted that nursing notes seemed to be minimal and essentially uninformative. When patients were transferred from one unit to another, the Kardex, medication cards, and nursing care plan (if any) were sent with them. The receiving ward was notified by telephone and given a verbal report on the patient's condition. If he was very ill, a nurse accompanied him.

Another problem noted by the Team was that accidents were not always reported or assessed properly. Patient falls, generally related to toileting or showering, accounted for the highest number of accidents. This problem may be related to the fact that patients, especially military personnel, often have the responsibility for their convalescent care including personal hygiene,

carrying meal trays, measuring and recording intake and output, finding their own way to diagnostic testing laboratories and therapy centers, and preparing some of their own treatments such as Sitz baths. These duties not only lightened the staff nursing load, but also provided occupational therapy to prepare the patient for hospital discharge.

Patient Instruction

The nurses on the Team were very concerned about the lack of a comprehensive patient-teaching program. Physicians generally explained operative procedures, pathophysiology, and therapy to patients while nurses only reinforced or clarified this information. Except for teaching diabetic self-care, diet, and hygiene or giving instruction on clinic visits, nurses assumed little initiative in patient teaching. Team observations indicated a lack of patient-professional communications; patients were frequently confused over the tests and studies being performed.

One nurse who had been in the service for eleven years stated that few nurses utilized available opportunities to teach patients, resulting in frequent patient relapses. Neither the nurses nor the hospital had special teaching materials, and patient teaching was usually on a superficial, one-to-one basis at the patient's bedside or in the Outpatient Department.

In one hospital, the team found an excellent patient teaching program which had evolved around family planning. The classes were extremely well-attended. In the ante- and post-partum clinics and other family-oriented programs, conferences, teaching films, tapes, and tours of the hospital were both innovative and effective.

Team members were concerned about the lack of preventive health teaching for all military personnel and their dependents. They felt that classes on disease prevention and hygiene could promote good health practices as well as reduce the number and length of future hospital stays.

Orientation

Nurses received a basic orientation to their military role prior to assignment. Each institution visited also attempted to provide additional orientation programs, usually by rotating the nurses on all services to enable the nurse to function more effectively as a "generalist," while still acquiring special skills. One problem noted was that rotation frequently continued after orientation was completed. As a result, nursing performance was often erratic because rapid changes from service to service prevented the nurses from becoming effective in any one service.

Continuing Education

The Team felt that a career in military nursing could be made considerably more attractive through further educational opportunities. Although the military has some educational programs permitting career nurses to finish their college educations while in the service, programs for continuing education were not well coordinated nor were they the same in each facility.

In many in-service programs, nursing staffs relied heavily upon films provided by commercial drug houses, although they were not always appropriate to military nursing. Unfortunately, sessions were scheduled during on-duty hours and attendance was optional. Only one Medical Library visited had a shelf with nursing texts and references.

Research

No nursing research was being conducted at any of the hospitals visited with the exception of occasional surveys to ascertain the career goals of military nurses or to determine the nursing needs of patients in order to calculate staffing levels. Although nurses occasionally assisted physicians with research projects, this was rare.

CORPSMEN, TECHNICIANS, AND SPECIALISTS

In many ways, the corpsmen and technologists were pivotal personnel since they provided most of the direct and indirect patient care. When billets were

unfilled or turnover was high (100 percent at one hospital within a six-month period), the patient care system tended to falter and efficiency was affected. For example, the volume of surgery performed on a given day in one operating room reflected not only the number of patients awaiting surgery, but also of the number of corpsmen available to scrub as technicians. A primary concern of the Team, therefore, was not only how to attract, train, and retain corpsmen in the military, with special attention to career potential, but how to operate the system to permit sufficient tenure in critical areas for the hospitals to function more efficiently.

In-service Training

The basic medical specialty training program for corpsmen varies throughout the three services: the Army program is 440-hours; the Navy, 560 hours; and the Air Force, 428 hours. Course content varies as much as program duration.

The Team summarized the following as specific problem areas in corpsmen curriculum: (1) little practical experience is provided in the major portions of the didactic program; (2) too little emphasis is placed on observing and reporting patient symptomatology and record-keeping; (3) curriculum is organized according to anatomical systems rather than syndromes taught concurrently with the nursing process; (4) the scope of the training programs is considered too general and oriented more towards field hospital training than hospital teaching. Although the latter may apply more to pragmatic military needs, it may result in reduced military career development and ultimately, inefficiency.

Assignments

The number of corpsmen assigned to the three hospitals visited varied. At the Naval Hospital, the ratio of corpsmen to nurses was approximately five to one and the ratio of corpsmen to physicians was six to one. Because assessment of ward and clinic staffing was complicated by the use of "working patients," the effectiveness of these ratios was difficult to interpret. One problem in using patients as part of the ward personnel roster was that the wards with

the "light" care patients had the largest number of patient-workers. In the Orthopedic ward at Beaufort Naval Hospital, for example, 30 percent of the patients needed intensive care, however the number of patient-workers was one-third less than in a corresponding "light" care ward. In all hospitals visited, the nurses considered the staffing minimal or subminimal in almost all areas where corpsmen played a key working role in health care services. This problem was compounded in one of the hospitals visited because most of the direct patient care was given by corpsmen with less than six months experience.

Utilization of Corpsmen

Much of the direct and indirect patient care is given by these non-professional military personnel. Many corpsmen regarded an assignment to a specialty clinic as highly desirable because the skills they learned could be an asset in civilian employment. The Team also observed instances where trained technicians were assigned jobs unrelated to their specialty training such as a trained Otolaryngology technician assigned as a clerk-typist.

A less tangible problem related to male corpsmen performing within a largely female nursing service. The "blunting" of the male ego coupled with a lack of status within a similar civilian system appeared to reduce pride in work.

In the Base Level Health Care System, the corpsmen seemed to assume more responsibility at the periphery of the System, particularly in the dispensary, where they related directly to the care of military personnel and often became major decision-makers. At one detached dispensary for an air station, which cared for a population of approximately 5,700 including dependents, 53 corpsmen served nine physicians. Most of these corpsmen were specialists assigned to laboratory, radiology, and transportation services. At another dispensary, corpsmen with high ratings were responsible for sorting sick call patients either by sending them directly to the hospital, assigning them to one of the dispensary physicians, or providing minimal care and returning them to duty.

Corpsmen were given remarkable responsibility including suturing all wounds not requiring hospitalization. The physician in charge indicated that these corpsmen were skilled and rarely required supervision. No data were available on incidence of wound complications in these instances.

Corpsmen also functioned with minimum supervision at processing centers where discharges were processed or annual physical examinations conducted. In one center, a Chief Dispensary NCO, an ENT specialist, two medical lab specialists, an X-ray assistant, an ENT assistant, and a dispensary orderly processed up to 3,500 men monthly. Nine additional men were used as clerks, although several had been trained for such non-clerical positions as flight surgeon's assistant or EKG technician.

Specialties

Corpsmen can be divided by training and experience into four major groups:

(1) Those with only basic training, usually short-time service personnel such as draftees, who are assigned to wards for on-the-job training.

(2) Those trained as technicians in specialty areas of diagnosis such as radiology, laboratory, or physiotherapy.

(3) Those trained as technicians in specialty areas of therapy such as operating room, otolaryngology, or urology.

(4) Those with specialty skills and assigned to dispensary and clinic areas requiring some direct decision-making such as sorting patients on sick call.

Corpsmen in the Recovery Room, Operating Room, Intensive Care Unit and Orthopedic wards have other responsibilities than those in the above categories.

Corpsmen who have enlisted for four or more years often become highly specialized as a result of extensive on-the-job training. The Team noted that specialist corpsmen performed very effectively in delivering direct patient care on the various wards. Since direct patient care is a critical part of

the health care system, ways must be found to encourage more corpsmen to become such specialists.

The Health Care Study Team observed "wardmasters" at two institutions. These personnel were responsible for ordering supplies, equipment and maintenance, as well as contributing to the control and conduct of other personnel on the ward. The role was designed to relieve the charge nurse of some of her non-nursing administrative functions, since clerks or secretaries were used in only a few of the nursing units visited.

ALLIED HEALTH SPECIALISTS

The Health Care Team did not review in depth the Allied Health Specialists. The Team observed that in general, in the facilities visited, the Army and Air Force hospitals used staff dietitians, and the Navy used consultants. One hospital supported six dietitians, two of whom provided diet therapy with the assistance of six dietary aides. Staffing was affected by special dietary requirements even though they are not as varied as in civilian hospitals. The Navy Hospital was serviced by a consultant who visited monthly but these services were of limited value.

Optometrists were among the most plentiful of the allied health specialists, probably because military optometrists generally exceeded their civilian counterparts in stature and professional relationships with physicians and other military medical personnel. Their relationship with ophthalmologists was uniformly good throughout the service and they performed an important supporting role.

Pharmacist staffing was notably inconsistent in the hospitals visited. A 774-bed hospital with 734,000 annual out-patients visits had three registered pharmacists and seven enlisted pharmacists (pharmacists with Bachelor's Degrees). A 270-bed hospital with 75 percent of its medical activity in out-patient services, had two registered pharmacists, three pharmacy technicians, and two on-the-job trainees. All pharmacies generally appeared understaffed for the volume of activity.

Psychologists were utilized for diagnostic testing, behavior therapies, and conditioning of patients; however, only those with doctorates were commissioned. The Army had approximately 165 psychologists and the Air Force only 26, although billets existed for 42. The remuneration for the clinical psychologist was not comparable to civilian income, and promotion was slow, despite professional excellence and in-depth training, since they must compete with line officers. Air Force psychologists report to the Bio-Medical Science Corps of the USAF Surgeon General's Office. The majority of psychologists engaged in extra-medical activities for economic factors and few remained in the services beyond their legal obligations.

Their was a great need for librarians trained in record room procedures in the facilities visited; all had recurring difficulties in retrieving and handling records. With ambulatory care visits approaching 500,000 annually in one facility and record storage divided into two or three areas, retrieval was frequently chaotic and complete reorganization seemed necessary. Recruitment of librarians is difficult, however, since salary grades are not competitive with other governmental agencies and civilian institutions.

RECOMMENDATIONS

Physicians

- Military careers should be made more attractive and competitive with civilian opportunities by expanding continuing education programs using self-instructional and multimedia aids, and providing opportunities for professional meetings and short courses, and developing a peer audit review system with the assistance of the Joint Conference Committee of the AMA.

- Utilize physicians more effectively by:
  (1) Stabilizing assignments of physicians so that they can better develop services.
  (2) Relating physicians assigned to dispensaries to hospitals through assignment rotation and continuing educational activities.
  (3) Training all commanding officers as administrators, and for the future, consider appointing non-physicians as professional administrators.
  (4) Continuing to seek ways to draft, train, and use osteopaths in the military services.
- Upgrade professional personnel and encourage career development by:
  (1) Creating a Division of Medical Education for physicians related to the National Library of Medicine and a National University of Health Science for Continuing Education Services.
  (2) Developing academic opportunities; supporting clinical research in such areas as patient care, clinical diagnosis, diagnostic accuracy, and therapeutic applications; and encouraging the appointment of physicians as clinical professors in nearby medical centers.
  (3) Upgrade board certified physicians by developing retraining programs followed by voluntary recertification, a concept rapidly developing and gaining acceptance in civilian health care systems.
  (4) Instituting effective cooperative programs with civilian medical systems for more effective consultation sources as well as for joint planning, implementing and evaluating regional health care programs.
  (5) Offering attractive, shorter retirement programs, i.e. 10 years and annuities, as well as educational support opportunities for dependent children.

Nurses

- Utilize nursing personnel more effectively by reducing excessive rotation of nurses both within a facility and from one assignment to another. Administrative and supervisory personnel should not be transferred more than every three to five years.

- Make military health care careers more attractive than civilian opportunities and encourage nurses to upgrade their professional skills by:

  (1) Encouraging nurses to obtain their baccalaureate degree and additional education, particularly in clinical areas such as medical, surgical, maternal and child health, and psychiatric nursing, and provide opportunities for attending educational meetings and continuing educational programs. The military should underwrite the expense of these activities.

  (2) Expanding utilization of nurses with specialty education for leadership positions in clinical areas.

- Improve nursing care by instructing professional nurses in the theory and methodology of teaching so they can better supervise and train corpsmen and orient and instruct patients.

- Establish a nurse practitioner (nurse physician's assistant) to provide greater patient care management at the clinic and ward level and give nurses greater responsibility in patient care decision-making. Nurse graduates of a hospital diploma school or a baccalaureate program with training in physical diagnosis and primary treatment can provide at a staff nurse level such broad responsibilities as screening diagnosing, referring patients, counseling and patient education.

- Utilize nurse clinical specialists in supervisory capacities for outpatient clinics and nursing units with primary responsibilities focused on direct patient care. Educational requirements are a graduate of a Nursing

Masters program with specialty training in a clinical area such as surgical, medical, pediatrics etc. The clinical specialist's role will expand in the future to one of a collaborative role with the physician in performing physical examinations, diagnosing and treatment.

- Utilize nurse educators to develop orientation, inservice education programs and continuing education programs for all levels of nursing. This personnel category requires a masters degree in nursing (with in depth knowledge in one or more areas of clinical nursing) and graduate training in theory and teaching.

Corpsmen

- Upgrade the skills of corpsmen, specialists, and technicians by:
  (1) Broadening curriculum content to cover decision-making activities in problem areas such as: drug abuse, malingering, psychoneurosis.
  (2) Adopting a career-ladder approach and encouraging corpsmen to qualify as licensed practical nurses, registered nurses, or as other allied health specialists.
  (3) Reducing assignment rotation to increase ward efficiency.
- Investigate a standard curriculum for corpsman of all services. Curriculum should include study in both biological sciences and the administration of nursing care. Each service should design a portion of the curriculum to be tailored to the needs and mission of the individual service.
- Develop an innovative position of "barrack health master" with training in preventive medicine including communicable disease, safety, and trauma prevention. These corpsmen on the staff of the drill instructor, would be stationed in the recruit barracks to provide, with appropriate responsibility and authority, basic health care and other screening services. Such a position would reduce visits to dispensaries and outpatient clinics by recruits.

- Develop a corpsman-physician's assistant program in which selected corpsmen would be given additional training in physical diagnosis and treatment to relieve the physician of such tasks as history taking, physical examinations, record keeping, writing orders (under physician supervision), and making periodic checks of ward patients (rounds). The corpsman-physician's assistant should be utilized in dispensaries or clinics and wards with a predominantly male patient population.

Allied Health Disciplines

- Give allied health specialists professional recognition by rank and salary comparable to their civilian counterparts to encourage career development and retention.
- Train selected allied health care personnel in such areas as administrative assistants, educational specialists, medical records librarians, dietitians and multiphasic testing technicians.

4.2 FACILITIES: DESIGN, SPACE ALLOCATIONS, AND SERVICES

The goal of facilities design is to ensure personnel efficiency through improved resource allocations, and permit maximum flexibility to adjust to new or changing service demands. The Team reviewed three BLHC Systems to evaluate design and resources from a professional standpoint and to propose avenues that can lead to innovative improvements, in both ambulatory and inpatient areas.

AMBULATORY MEDICAL SERVICES

The tremendous growth in demands for all aspects of ambulatory care was not fully anticipated in the design of present military facilities. As a result, dispensaries and outpatient clinics have little or no room for expansion and little or no flexibility for rearranging or using facilities for more than one purpose. Because ambulatory services are spread throughout the facilities, undesirable flow patterns of patients, staff, materiel, and communications all too often produce confusion, congestions, and inefficiency.

Dispensaries

Dispensary units are outpatient facilities physically detached from a hospital, developed to bring health care to active duty personnel and to provide other "non-hospital" preventive health service, such as annual physical examinations, discharge examinations, and immunization services.

A single, large dispensary or several dispensaries may be located on or near a large military base with multiple service activities. These dispensary facilities are generally satellites of Base Level Health Care Systems. When geographically removed from a base that provides a full range of patient care, beds are provided for short-term observation and care.

In addition to providing ambulatory care for assigned or transient personnel, dispensaries also handle physical evaluation and examination for personnel

departing to, or returning from, overseas assignments, and personnel terminating military service as well as for admission to military academies, officer candidate schools, and appointment as reserve officers.

In general, dispensary units were housed in barracks or outdated buildings. As a result, the major defect in the dispensaries visited was the poor relationship between the building design and the health services rendered. Services had to be adjusted to the available physical surroundings and inefficiencies were frequently noted because of the lack of space, poor location, or outdated buildings.

In large dispensaries, a major part of the space was allocated to sick call examination, with additional space for a waiting room, doctors' offices, a small laboratory, a pharmacy, or X-ray unit. Major dispensaries assigned to large depots had space for up to 50 beds in two wards for short-term observation and treatment not requiring the facilities and services of the base hospital.

The examining facilities in these units were designed for a steady flow of personnel through a series of adjoining rooms. Facilities for examining inductees, dischargees, or other personnel consisted of individual rooms for specific types of examination such as: general examination; laboratory assessment (serology, urinalysis, 70 mm chest X-ray); EENT survey; muscule-skeletal and dental examinations; and a room for physical assessment by the physician, either upon the request of a serviceman or upon the discovery of a physical defect in the screening process. A fairly new addition to the standard technical testing was the audiometric examination.

At those bases visited that had primary aerospace or flying missions, medical facilities were provided to support these operations. These facilities offered a range of services including: physical examination; evaluation and surveillance of the physical and mental health of flight crews, air controllers, radar control operators, and applicants for flight training; flying safety; physiological altitude evaluation and training; special clothing and equipment for flight personnel, and bionucleonics, etc.

Special dispensaries for women were also scattered throughout the system and were generally similar to those for enlisted men. They were physically separate and usually some distance from the male dispensaries, requiring duplicate physician assignments or physician travel.

Some of the problems observed in the dispensaries relate to areas discussed in other sections of this report. For example, the dispensary system is probably the least enticing to physicians. Many physicians stationed at dispensaries said they were frustrated because they were cut off from the main hospital facility by both physical distance and inadequate communication and because of the tedium of the assignment. However, where physicians worked in hospital facilities, and the physicians' duties have been only partially concerned with the dispensary, this service was reported to be less onerous.

In summary, the Team found that the dispensary system tended to be poorly related to other echelons of health services, particularly in the lack of professional and consulting communications. Buildings were not always designed for the services offered such as mass health screening or physical testing, and they were also ill equipped for "mass" therapy of minor diseases or injuries. The physical dissociation of dispensaries from the base hospital coupled with problems in record keeping leads to wasteful practices and duplicated efforts at many administrative and professional levels.

Outpatient Clinics

The most serious problem in Base Level Health Care Systems today is the burgeoning demands by dependents and retirees for outpatient health care services which already demand more than half the time of BLHC physicians. Outpatient visits to fixed military medical facilities increased from 21.4 million in 1966 to 25.7 million in 1969.* More importantly, dependents and retirees often demand comprehensive medical care which places heavy burdens upon the military health system.

* CHAMPUS Report 1969.

The Team did not know in detail the role of CHAMPUS and its relation to demands on the clinics of the hospitals visited. However, a review of the CHAMPUS annual report showed that in 1969, CHAMPUS accounted for three million, or 15 percent, of the total outpatient load upon fixed military medical facilities.

The facilities surveyed were not designed for current patient volumes which, in one instance, approached one-half million outpatient visits annually from a base of 20,000 service personnel. Since no room for expansion was allocated in planning, it is very difficult to adapt old construction to present, let alone future, demands. Even hospitals built within the last ten years have already demonstrated serious physical shortcomings which create service delays and inefficiencies.

Some examples of planning deficiencies in clinics include: an insufficient number of examining rooms per clinic physicians and for certain specialties (otolaryngology, ophthalmology, urology); a lack of waiting rooms; and small, inundated pharmacies (75 percent of drugs dispensed at one hospital pharmacy were to outpatients) with long waiting times at peak periods.

One outpatient service unit, originally designed for one wing, had spread to an additional wing to meet growing demand. As a result, certain diagnostic and therapeutic services such as the Laboratories, Radiology, and Physiotherapy were inconveniently distant from the clinic areas.

In some facilities, specialty service units for Preventive Medicine, Obstetrics, Pediatrics, and Allergy were added in recent years using many unique and effective design elements. Problems in these new units involved inadequate supporting elements, such as appointment systems, referral clinics, and diagnostic units.

The Team noted how one well designed "medical-surgical clinic" employed a "core" structure, with waiting rooms, examining facilities, and diagnostic rooms adaptable to use by more than one discipline. The Team also observed a variety of other planning related problems including inadequate or

non-existent eating facilities, and services or conveniences such as waiting rooms for children or baby-sitting services.

The design of the Outpatient Pharmacy was another common facility deficiency. Drugs are usually dispensed through a window to patients in a small adjacent waiting area. On busy days two to three hour delays often occurred. To compound the congestion, pharmacy waiting areas were sometimes located near entries to over-crowded outpatient clinics or emergency rooms.

The functioning of the Clinic Record Department was hampered because this department was usually separated from the main Hospital Record Rooms, and the transfer system was inadequate. As a result, records were frequently duplicated and hospital records filed separately.

Because the Emergency Department is usually adjacent to the clinic areas, it was often used out-of-hours for non-emergency problems. In some facilities this practice was eliminated by evening or special clinic hours.

Two other types of semi-outpatient services include the aeromedical facility and the medical holding facility.

Aeromedical Evacuation: Facilities designated as aeromedical holding or transfer points are provided to accommodate needs for patients in the aeromedical evacuation system. These facilities were generally annexed to the base hospital located at, or adjacent to, the air field. Patients received by these facilities were en route to designated hospitals for further care, treatment, and disposition and generally required only limited care.

Medical Holding Facilities: Another type of base hospital annex provides the necessary care and housing for military patients awaiting evaluation and review Board action to determine whether they qualify for discharge, retirement, or some other disposition. This facility provides only limited, and generally ambulatory care.

Emergency Departments

In assessing the role of the Emergency Department and its facilities in the BLHC System, the Medical Health Survey Team used data collected by the Westinghouse system engineers to define medical emergencies. The five major categories of emergencies were:

- Trauma (fractures, lacerations, and burns)
- Gastrointestinal (vomiting, diarrhea)
- Gynecological (miscarriages or vaginal bleeding)
- Respiratory or pulmonary distress (infections, pneumonia)
- Cardiovascular disease (angina)

Under these categories, emergencies represented 10 percent of the emergency department visits at one hospital, 16.5 percent at the second (18 percent on weekdays), and 10 percent at the third. Life threatening emergencies represent less than two percent of the visits. The departments were used as walk-in clinics for the majority of visits.

Emergency loads in military hospitals are not as heavy as in civilian hospitals which average closer to 40 percent for emergencies. Although the size and design of military emergency facilities appeared larger and more complex than necessary, consideration must be given to the nature of the military mission and operations, and the accident potential at each base. The Emergency Departments observed by the Team varied according to these considerations.

In all facilities, a general entrance served the Emergency Department, as well as the staff, patients, and visitors. In two hospitals, the Emergency Department entry was off the main driveway near the general entrance, while in the third unit, it was at the rear of the hospital away from the main entryways, but was used occasionally as a general entrance by hospital employees.

All facilities had signs indicating the emergency department area; however, indications for the quickest route from the hospital ground entrance was inadequate. The Team considered the lack of prominent identification a deficiency.

Each facility had a single room well-equipped for sophisticated resuscitative effort, although in one instance, a defibrillator was not found in the immediate area.

INPATIENT FACILITIES

The military facilities visited were built for a large male population and designed for patients suffering from contagious diseases and trauma.

The Team found that the number and location of beds on general wards varied from hospital to hospital; one facility had 52-bed "open" wards (with two, 4-bed, semi-private rooms), while another had allocated two-thirds of its space to private and semi-private rooms. Where military hospitals serve induction and training centers, particular attention is paid to controlling contagious diseases such as meningitis, influenza, and rheumatic fever. Because services to dependents and retirees are often separate from those for regular military personnel, some essential services are duplicated.

Wards

In only one hospital were officers and enlisted personnel patients mixed. In addition, patients were segregated, when possible, by age and sex. Unlike most civilian hospitals, some surgical wards were designated as "clean" or "dirty," a military practice designed to isolate one environment from another to reduce cross-infection from hospital personnel or through the adjacency of infected or contaminated patients. Segregating patients by disciplines (e.g. hematology, pediatrics, or orthopedics) or by disease (e.g. pulmonary and cardiovascular) is also a conventional civilian and military hospital practice, but it tends to limit flexibility.

Nursing facilities in the three hospitals visited showed many similar problems. Some common problems include the following Team observations:

- The nursing stations were not always centrally located, making efficient access to patient rooms and patient observation difficult, particularly in the nurseries. The stations were further congested by drugs being stored within the station.

- Storage space on the wards was at a premium for linens, disposables, and standing equipment.
- No private offices for Charge Nurses were available for planning, counseling, and teaching patients and staff.
- Bathroom facilities were often inadequate for the large ambulatory population. The Team was particularly concerned about the frequent absence of hand rails and other safety devices, since falls in the toilet facilities are a major cause of patient injuries at most institutions.
- Few solariums were available for patients and those that were did not have adequate recreational facilities. Many patients complained of boredom and patient morale was often a problem. The Team felt that design factors such as inadequate telephone facilities, noise, and drab colors, contributed to patient complaints.

Other problems in facility design involved maintenance of existing facilities such as non functional signal lights, telephones, pneumatic tube systems, and intercoms. Although in some cases parts were no longer available for the older systems, these problems were often due to a shortage of trained maintenance crews.

Intensive Care Unit

In two of the three surveyed hospitals the Intensive Care Units combined recovery room, intensive care, and coronary services.

In one hospital, the unit consisted of eight beds in an open L-shaped ward, a total of 1116 square feet with a nursing station located near the entry of the facility, a storage area (144 square feet), and work rooms (252 square feet). Monitoring equipment was available for one bed, but no backup equipment was available. The average bed occupancy for a six-month period was 2.5 patients with an average stay of a little over two days. The second hospital contained two Intensive Care Units; one for surgical and one for medical patients. The

surgical unit, adjacent to a five-bed recovery room, had 13 beds in three rooms -- two four-bed rooms and one five-bed room. The Team noted that the nursing station did not provide a complete overview of the five-bed room or the recovery room, both at opposite ends of a small corridor. In the Medical ICU, the average number of occupied beds was four. The third hospital did not have an intensive care unit. Although this facility had a coronary unit, it was separated from its monitoring systems by two floors with contact by telephone only.

The team questioned whether separate medical, surgical, and coronary intensive care units were necessary. They agreed that combining these units would increase operational efficiency and lower costs in the three units surveyed.

In the operating rooms visited, space allocation, design, and location were generally conventional. Professional staffs indicated that space, sanitation, lighting, temperature, humidity, and air filtration control were adequate.

Key areas, such as Intensive Care Units and the operating room should have air-conditioning and ventilating systems separate from the rest of the hospital with auxiliary power sources. Priority maintenance and support are also essential for such services. No sophisticated surgical specialization was observed. No operating rooms were equipped with monitoring apparatus or with fixed X-ray units for orthopedic surgery or angiography. All institutions separated obstetrical delivery rooms from the general operating rooms, except for gynecological surgery.

In all hospitals visited, office and storage facilities for the anesthesiology services were inadequate. Consequently, anesthesia equipment was often stored in hallways.

The recommended ratio of operating rooms per hospital bed is generally four units per 100 surgery beds. Generally, the Team felt that too few operating rooms had been designed on the basis of this ratio. In addition, operating room

space was not always optimal. The Team also observed that the following functions or services were not always adjacent or easily available to the operating rooms: radiology, surgical pathology, laboratories, post anesthesia, recovery rooms, and surgical intensive care units.

The influx of contaminated equipment and personnel into the operating room areas is a general problem at civilian and military facilities. At the facilities visited, compartmentalization has been attempted as a solution by separating hallways outside the operating rooms from the nurses' stations. However, many operating room areas were of a design that would restrict and isolate service personnel from the unit. Since they could not enter alternative areas, such as the nurses' station or the clerk's desk, delivery of supplies and even normal communications were difficult.

Chemistry and Pathological Laboratories

The three chemistry laboratories visited by the survey Team ranged from small and overcrowded to large, well-equipped, and sophisticated.

Between 80 and 90 percent of the test requests could be performed in the current chemistry laboratory facilities; two of the three installations had automated equipment (Technicon MSA-12). However, at one of the hospitals only three electrolyte chemistries had been ordered for one day; this low demand apparently was not unusual.

The Blood Bank laboratories rarely provided more than 20 units of blood weekly to the therapeutic services. However, they did participate in a much larger blood donor program.

When one busy hospital increased its outpatient services, it encountered difficulties in fitting new equipment into the space allocated to the laboratories. The waiting room was also inadequate, although it was adjacent to clinic operations.

Another hospital emphasized laboratory services and provided them for a number of other service hospitals. Its laboratory space allocations were quite

adequate and many sophisticated services were offered including endocrine chemistry and virology.

Delivering chemistry, surgical, and autopsy specimen information to physicians was probably the most common laboratory problem. Many procedures that should be completed and reported in 24 to 48 hours or less were seriously delayed, creating problems in the outpatient service system and in consulting services for dispensaries and discharge centers. These delays were generally caused by inadequate data handling systems. Those laboratories involved with the total health care systems were much more effective and better supported than smaller isolated ones.

Radiology Departments

Radiology, as a discipline, has a shortage of qualified physicians. Consequently, it is essential that equipment and space allocations are adequate for meeting the volume demands of the Base Level Health Care System, which include taking and interpreting X-rays and transmitting reports to decision-making centers such as the ward, clinic, and dispensary.

Where volume studies were necessary, as with chest X-rays, standard 70 mm. units were generally used. Most major dispensaries had a single, well-equipped standard X-ray unit. Film exposures at all hospitals had increased, as much as 33 percent over the past four years at one institution, while laboratory procedures at the same hospital increased approximately 66 percent. All hospitals were well-equipped to handle the current demands placed upon them; however, space allocations were inadequate and inefficient. Outpatient Service demands created overcrowded waiting rooms, dressing rooms, and physicians' offices. With the increase in the retiree population, larger facilities will be necessary to perfrom the sophisticated studies which will be required (i.e., coronary angiography, cerebral angiography, and pneumography).

The most obvious diagnostic deficiency in all Radiology Departments for hospital size was the inability to provide special examinations. Angiography or isotope scanning was available on a limited basis in only two of the three hospitals.

The demand for X-ray studies in the operating room was light, but equipment for taking both lateral and anterior projections of fractures was usually not available.

Another recurring problem in the Radiology Departments visited was inadequate film storage facilities, compounded by the transiency of military patients and their dependents.

RECOMMENDATIONS

Ambulatory Medical Service

- Dispensaries, or Military Health Service Centers, should be retained and designed to provide the following services:
  - (1) Primary identification of illness or injury.
  - (2) Preventive medicine program.
  - (3) Minimal outpatient medical, surgical, and supportive treatment.
  - (4) Modern screening methods for sick call.
  - (5) Outpatient mental health services.
- Obtain maximum flexibility and personnel efficiency by:
  - (1) Organizing, staffing, and equipping Health Care Service Centers as functional elements, under the jurisdiction and control of the base hospital, using sophisticated communications, transportation, and services.
  - (2) Increasing the utilization of nurses and technicians to perform dispensary services to gradually reduce the physicians' workload.
  - (3) Military Health Service Centers should provide services to both men and women as an integral part of the Base Level Health Care System and the "New Generation" Military Hospital.

(4) Interfacing dispensary physicians with the hospital system for conferences and other education programs.

(5) Designing induction, discharge, or screening centers to operate in the future as multi-phasic testing centers. These centers should have the required facilities, support, communication, and audio-visual systems to operate efficiently and economically.

(6) Including audio-visual "decision-making centers" for consultation, to eliminate an estimated fifty percent of hospital referrals, to promptly alert hospital staff to the details of more acute problems and permit more rapid communication of health care data.

(7) Establishing hospital-based, self-powered mobile clinics to provide sick call services at remote military areas. These units would be composed of a van staffed by hospital-based personnel and equipped with limited laboratory, pharmacy, X-ray facilities.

Clinics

- Provide maximum flexibility and use of present clinic facilities by initiating:
  (1) Extended clinic services in high-demand areas, such as Obstetrics and Gynecology and Pediatrics for evening coverage.
  (2) Increasing the number of multiple-use clinics whereby several specialty clinics use the same facility on different days.
  (3) Meeting needs for patient-family education and counseling, including use of multi-media aids.
- Devising a system whereby routine services for dependents and retirees would be located in the clinic while specialty services would be related to the hospital.
- Establishing telecommunications stations with direct access to the Medical Record room, clinics, wards, dispensaries, laboratories,

radiology, and physicians' offices, to record and make message systems more efficient.

- In addition, the communications system should be related to the emergency department and all emergency service sections of the hospital to the ambulance system, referral hospitals, and the next echelon of military hospital.
- Maximize facilities flexibility and efficiency by:
  (1) Provide environmental isolation at each bedside with current or modified "life island" equipment to ultimately eliminate the need for special isolation rooms. Increase floor space of all special units.
  (2) Provide more sophisticated and standardized monitoring equipment in all units to display and record pulse, systemic blood pressure, central venous pressure, temperature and EKG with single or multiple leads. In addition, monitoring should provide urinary output, respiratory rate, availability of basic blood chemistries, gas tensions and hematocrit and urine osmolality.
- Improve patient care by:
  (1) Implementing a closed circuit audio-visual system for consultation, related to nearby university hospitals or medical centers.
  (2) Developing medical intensive care units where retiree population assessment indicates that chronic geriatric diseases (i.e., pulmonary) are a major health need.
  (3) Using computer based physiological monitoring to determine catastrophic trends before irreversible signs evolve. *

<u>Inpatient Facilities</u>

- Provide flexibility and efficiency by:
  (1) Having regional military hospitals provide rarely utilized laboratory tests.

* Reference- Dr. Homer Warner, Latter Day Saints Hospital, Salt Lake City.

(2) Implementing computerized techniques including automated testing procedures, terminals for laboratory result readout in nursing stations, outpatient departments, remote facilities, etc., communications systems with hospital decision-making centers, disease detection systems, and quality control for the Clinical Laboratories.

- Provide improved patient care in the future by:

(1) Developing film scanners using computer systems to identify major alterations in standard chest X-ray film.

(2) Reducing decision-making time at dispensaries, clinics, and hospital wards by implementing immediate transmission of reports or X-ray films between the physician and the Radiology Department. When Radiologists are unavailable, films should be transmitted between centers or between dispensaries and hospitals for consultations.

(3) Using two-dimensional tomography and holography coupled with angiographic techniques to complete radiographic disease assessment by more precise morphological dimensions.

4.3 PROFESSIONAL PHYSICIAN SERVICES

Professional medical services in the military vary from those in civilian community hospitals in that the major demands and emphasis are in the outpatient clinic system. In the inpatient facility, most patients are ambulatory and few are critical. Conceptually, the health services of the military system provide a comprehensive health care program to active military personnel, retirees, and dependents which surpasses the programs offered by most civilian services. The quality of these services is reflected in the Team's observation of the various professional services.

MEDICAL SERVICES

The physician services at the military hospitals visited were very similar to those in large civilian hospitals in that they generally consisted of inpatient and outpatients services, complemented by medical subspecialty practice and consultation. The chiefs of service were fully qualified, board-certified specialists.

General medical physicians, who have usually completed their internship, but are not qualified for board certification, were in the greatest demand in hospitals and the medical service was most directly in need of them. These physicians provide in- and outpatient care in the absence of subspecialty colleagues and meet the complex needs of an emergency service and broad patient demands.

Staffing was disparate among the services; the number of doctors in the Medical Service ranged from six to twenty and the number of subspecialties varied accordingly. One large hospital, for example, had four cardiologists, one gastroenterologist, two hematologists, and one endocrinologist, but all subspecialty disciplines were not usually represented. In the military medical service there were fewer certified internists than in comparable civilian hospitals, and generally, one internist would provide services in more than

one discipline, such as general medicine, gastroenterology, and endocrinology. A cytogenetic service was available in the one facility designated as a "center."

The Chiefs of Service were consistently satisfied with the caliber of their staffs, the majority of whom were well trained, post-residency men. Under the draft law and by comparison with civilian hospitals, the military hospitals in the United States have only minor staffing difficulties. A major problem appears to be the optimal use of available staff and the development of programs to attract good doctors to a career in Military Medicine regardless of the draft. Only one hospital had general practice residencies and these were not filled; most of the Medical Services had none. Where interns and residents had been present but were no longer available, the services appeared to suffer.

The prevalence of diseases differed from those in civilian hospitals. Bed occupancies on the Medical Services tended to be much more seasonal than on Surgical Services; the heaviest load occurred during the winter months when communicable and infectious disease admissions were high. Upper respiratory infections usually exceeded the volume of other admissions to the Medical Services by threefold.

Patients with certain diseases, such as tuberculosis or chronic pulmonary disease or with conditions requiring special treatment such as cardiac catheterization, were referred to hospitals outside the BLHC System.

Since two of the hospitals visited were at recruit training centers, the incidence of meningitis and its management were of major concern. One hospital found that about 18 percent of the recruits were carriers of the meningococcal organism when they entered the training program, and that upon completion of training the percentage had increased to 80 percent. At this hospital 50 to 70 cases of proven meningitis were admitted annually. Epidemiology and control of meningitis remain a major problem of the Medical Services. Current measures, however, were considered effective in view of the environment of military training and operations.

In the outpatient clinics the Medical Service also carried a major load because its staff generally provided screening, general medical, and acute medical care. Medical Services did not seem as overburdened as Surgical Services by demands for consultation from the dispensaries, probably because the chief problems at dispensaries, excluding upper respiratory illnesses, involved musculo-skeletal, traumatic, and psychiatric problems. Patients with upper respiratory illness and 100°F of fever were usually admitted directly to inpatient care and, therefore, did not tax the outpatient services.

Most physicians viewed duty on the medical wards and specialty medical clinics as desirable and considered duty on general medical clinics, dispensary, and emergency services burdensome and undesirable.

SURGICAL SERVICES

In general, the Surgical Services at the hospitals visited had very similar characteristics. There are variations by specialty, the outpatient, surgery, diagnostic, and consulting services of the surgical appointments consumed approximately 65 percent of the professional staff's time. Board Actions, record-keeping, and similar administrative duties required as much as 30 percent of the staff's time while the balance related to operative (inpatient services and ward) therapeutics.

All hospitals provided a recognizable core of surgical services, i.e., General Surgery, Orthopedics, Urology, Anesthesiology, Otolaryngology, Ophthalmology, Cardiopulmonary, and OB-GYN. Neurosurgery and Plastic Surgery were not available; patients requiring these services were referred to the Regional Centers.

The surgical services offered at these facilities depended upon administrative policies of rotating specialists and the general scarcity of physicians in certain disciplines, as well as on the anticipated or proven demands in the areas served. While two of the facilities had no thoracic surgeon, the remaining hospital, recently designated a "center," had two and was developing a reasonable load of pulmonary surgery and some cardiac surgery.

The character of surgical activities was also reflected in the surgical problems referred to other military hospital centers. These included

amputations, major plastic reconstructions, burn treatment (if more than 25 percent of the body), cardiovascular disease, most major pediatric congenital defects, hand surgery, and abolative tumor surgery.

If dependents and retirees required sophisticated diagnostic or therapeutic services, most of the surgeons arranged for consultations at other military or civilian facilities under the CHAMPUS Program.

It was difficult to distinguish "major" from "minor" surgery, since definition relates more to the type of anesthesia (general or spinal) than to the type of procedure. Major operations exceeded minor ones, but outpatient surgery performed in the clinics or emergency room was not included in the data. Operative surgery was characterized by a low clean wound infection rate (0.5 to 1 percent), few operative deaths (2 out of 3,370 operations), and few major complications.

The volume of surgical procedures tended to be low due to the military system of referrals and regionalization of care for complex surgery. None of the hospitals exceeded 3,500 procedures annually. Procedures were frequently the type that generated minimal professional skill and required only standard judgments.

The surgeons tended to agree on their problems and the demands for their services. They stressed the overload of paperwork; the disproportionate number of beds occupied by ambulatory patients awaiting administrative or disposition actions; the need for better communications with the diagnostic services; and the need for more space, more examining facilities in the clinic, and more equipment to meet the volume of diagnostic activities.

Because the surgeons were concerned with many non-professional routines or minor decision-making, almost all voiced the need for technicians, nurses, and particularly secretaries. A continuing major complaint was the inadequate numbers of operating room technicians and supporting staff personnel, and their high turnover.

Surgeons on busy services complained of little time for joint conferences or educational activities and few of the disciplines held mortality or complication conferences.

A particularly difficult problem occurred in services, such as Anesthesia, Urology, and Orthopedics, where only one qualified specialist was on the staff. Of all staff members, he was the busiest, the most burdened, and the most in need of support personnel. Where these individuals are involved in extra-military professional activities, critical situations may result. The problems of these services are complicated by the "super specialist system" in which complaints related to a given anatomical area are referred to specialists, particularly in Urology, Orthopedics, and Otolaryngology. This situation emphasizes the need for more decision-making by general medical officers and other physicians in clinic and dispensary operations.

The use of "dirty" surgery versus "clean" surgery wards continues. This environmental isolation was frequently reinforced with single room isolation. While this practice is common in both civilian and military hospitals, modern techniques and trained personnel now make it a questionable one.

In addition to these problems, surgical services must consider the following: (1) surgical disease will remain much within the current ratio (70% general, 20% trauma, and 10% neoplastic); (2) seriously ill patients will remain under 1% and, if current staff quality and the range of diseases continues, the operative death rate will be negligible; (3) demands for out-patient surgical services will greatly exceed inpatient surgical services; and (4) attention must be directed to basic "organ failure" problems, which occur in cardiovascular disease, pulmonary disease, and renal disease.

The following sections contain Team observations on each of the surgical specialties.

General Surgery

All the General Surgical Services were well staffed although turnover was high; none of the chiefs had been in their position for more than a year. While the bulk of general surgery was minor, relating to such procedures as inguinal hernias, pilonidal cysts, hemorrhoids, and soft tissue infections, all

services had some volume of major surgery, such as tumors of the GI tract, duodenal ulcers and gallbladder disease, particularly in dependent and retiree populations. The General Surgical Service did little or no vascular surgery primarily because of the lack of angiography, experience, or consulting assistance.

Although General Surgery also provided some Pediatric Surgery, in which a few of the general surgeons had advanced training, dependents were usually referred to local children's hospitals for this service.

Orthopedics

Orthopedic Surgery, one of the major surgical activities, usually had more than 50 assigned beds. Most admissions were related to musculo-skeletal trauma, back pain, and knee complaints. All orthopedic units had some Vietnam casualties on long-term care. One third or more of the wards were filled with military patients awaiting disposition and physical evaluation. Since these actions often require up to 12 weeks for completion, Orthopedic Units usually had many minimal care patients.

At the recruit depots, foot problems and knee injuries created a heavy volume of referrals to orthopedists. For example, only two or three of every hundred military personnel examined in the clinic were admitted, but the examinations required considerable decision-making.

Because orthopedic problems at recruit training centers were heavy, one orthopedic surgeon made regular visits to the dispensaries at the beginning of his tour of duty. However, increasing responsibilities at the hospital forced him to abandon this service.

Most pediatric orthopedic problems requiring corrective or operative therapy were referred to civilian or other military centers, even though they accounted for 20 percent or more of the outpatient visits.

Because previous records were important in the follow-up of certain orthopedic problems, one Chief complained that the lack of continuity of records, particularly for dependents, made his work difficult. A new record was

generally started for a dependent if an old one was not immediately available causing considerable repetition of questioning and paperwork. The amount of paperwork on Orthopedics was particularly heavy.

There were few complaints regarding the Physiotherapy Services, and all orthopedic surgeons were grateful for the assistance of podiatrists, who at one facility, were permitted to operate on bunions as well as minor foot lesions. Corrective shoes remained the largest demand upon the brace maker services.

Urology

Patients receiving urological care at one facility were approximately 60 percent active duty personnel, 35 percent Pediatric dependents, and 5 percent other dependents and retirees. Only one of the three facilities had two urologists and the maximum number of inpatients at any unit was 20.

Most genito-urinary operations on military service personnel were for circumcisions, ligation of varicoceles, and the management of urinary tract infections. Venereal disease was not admitted to the urological wards, but treated by the preventive medicine section.

In the dependent-retiree outpatient clinic, urinary tract infections accounted for the bulk of genito-urinary problems. In the facility with two urologists, the outpatient volume exceeded 800 visits per month, with as many as 400 cystoscopies. This group felt they needed another cystoscopy room and more examining rooms to meet this volume. Most cystoscopies were carried out in the clinic area; a particularly large number related to children with varying degrees of urethral or meatal stenoses.

Despite the presence of retirees in all areas, the number of prostatectomies rarely exceeded three or four monthly, and bladder tumors and kidney tumors were very rare.

Urology was one area where the pediatric patient was not always referred to another facility. At least one urologist did several replantations of ureters for congenital malformations. His only problem was the unavailability

of a pediatric cystoscope.

Anesthesiology

Two of the three hospitals had only one anesthesiologist usually assisted by general medical officers with on-the-job trainees or nurse anesthetists. Even the presence of one anesthesiologist seemed to vastly improve operating room organization and services. Although anesthesiologists were primarily concerned with administering anesthesia, they also were responsible for the post-anesthetic recovery room, and to a certain extent, the ICU. None were directly concerned with operating the Inhalation Therapy Service. Approximately one-half of all anesthetics administered were spinal, regional block, or local.

Most of the anesthesiologists disapproved of anesthesia being administered outside of their purview, although they usually cooperated with the surgeons. All Obstetricians administered saddle blocks, although they rarely set up an infusion to provide fluids and drugs. The anesthesiologist also administered anesthesia in the clinic areas, particularly during cystoscopy in the Urology Section. Anesthesia machines were maintained in these areas.

Monitoring equipment was usually inadequate in all areas, and a major complaint was the lack of maintenance personnel to handle the calibration of these delicate instruments. Another problem was the lack of a full spectrum of ventilators for the Intensive Care and Recovery Room Units.

Because anesthesia was generally not included in the original hospital design, all anesthesiologists lacked adequate office and storage space. Their offices were generally located outside the operating room suite. They also complained of inadequate secretarial assistance and lack of cooperation from the operating room staff.

Since cleaning instruments was difficult, anesthesiologists tended to use disposable airways, endotracheal tubes, and other equipment rather than clean, sterilize, and repack. Although this is acceptable hospital practice, one anesthesiologist felt that the personnel administering anesthetics should

clean their own equipment.

Otolaryngology

Otolaryngology sections were usually well-staffed with two or three trained physicians. Corpsmen were utilized very effectively in the ENT activities particularly in the clinic, carrying out several diagnostic and screening studies. They also performed drainage operations for small abscesses, attempted initial control of nose bleeds, cleaned ears, obtained cultures, ordered X-rays, and performed caloric examinations. A heavy load of audiometric evaluations were noted since hearing loss is considered a major service problem. Because the ENT clinics were usually behind in their hearing tests by as many as 50 or more scheduled studies, a diagnostic problem was created since 20 percent of the patients had non-organic hearing losses.

Ophthalmology

All ophthalmology facilities were well-equipped. In general, surgical activities were light, but diagnostic and treatment activities were heavy. At all facilities visited, the ophthalmologist received considerable assistance from the optometrists who performed most of the refractions. This was an excellent demonstration of inter-disciplinary cooperation.

Neurosurgery

Information on the potential volume of neurosurgical disease and injury was not available for the facilities visited. The occurrence of head injuries at each of the three installations was estimated between 12 and 20 annually; and one center felt that it had a sufficient volume to justify a full-time assignment for this problem alone. Staff members repeatedly stressed the need for more neurosurgical consultation and diagnostic and therapeutic services.

A review of several head injuries at these installations suggested that the absence of a neurosurgeon led to delays in emergency care. Presently all neurosurgery patients are transferred to the next echelon of military hospital, although transportation over distances of 50 or more miles could

create major problems. The lack of available neurosurgical consulting support is further compounded in rural communities where two of the three hospitals visited were located.

Clearly some consideration should be given to either training the general surgeons in more effective basic neurological diagnoses and care (cerebral angiograms, myelograms, evacuation of epidural and subdural hematomas) or to evolving more effective transfer systems to military or civilian centers.

Plastic Surgery

Plastic and reconstructive surgery was essentially unavailable at any of the installations visited with one exception; a plastic surgeon visited the hospital monthly to perform one or two operations, and provide consultation services. Dependents and retirees requiring such services were usually referred to this surgeon's private office on a non-military medical care arrangement. When Vietnam casualties needed reconstructive services on either the Orthopedic or General Surgical Section, they were often delayed in their discharges by the extensive procedures required. Consequently, some arrangements should be made to provide the necessary plastic and reconstructive services or to transfer such individuals to institutions where such services are available.

Cardiopulmonary Surgery

While some thoracic or pulmonary surgery was performed at all hospitals, only one of the three facilities had trained thoracic surgeons and at that facility there were two. Pulmonary resections and cardiac operations for arteriosclerotic disease or congenital defects were generally referred to a Class II or major Military Center, or in the case of dependents, to a civilian center.

In the BLHC Center with two thoracic surgeons, these services were only being developed although several mitral commissurotomies had already been performed. Since the diagnostic services in the medical and radiology

units were limited, it was questionable whether cardiopulmonary services could be augmented without also expanding these major supporting services.

OBSTETRICS AND GYNECOLOGY SERVICES

At all units visited, Obstetrics and Gynecology was one of the busiest services for physicians, with one or more clinics running daily. Although the number of visits of dependents varied considerably from 15,000 to 68,000, the actual OB-GYN Services rendered did not vary to the same degree.

One facility reported 29,405 annual visits to its OB-GYN Clinic with an average of less than 100 visits daily. However, the total visits in this unit occasionally exceeded 200 in a day, principally in the Prenatal Clinic which met three times weekly. In 1969, the hospital had 2,152 OB-GYN admissions and 1,260 deliveries. The Cesarean section rate at that hospital was 2.6 percent, close to that at all facilities, but low compared to the national average. Unwed pregnant women were about one percent of deliveries, also low compared to the national average. Of six physicians on the staff, only one was Board certified. The number of deliveries per physician averaged about 210 per year.

At this hospital 278 major and 276 minor gynecological operations were performed of which 89 were abdominal or vaginal hysterectomies and four hundred were cervical dilatations and uterine curettages. The problems reported in this unit were relatively minor, ranging from complaints about the lack of chaperones, slowness of clinic examinations, to the inability to hold frequent conferences and other educational activities because of the heavy patient load.

This same facility had an excellent ante-partum education program for expectant parents conducted by a public health nurse. Attendance averaged 200 for each of five sessions, which included both training films and a tour of the hospital. However, the Family Planning Clinic averaged a very low nine to ten visits per clinic session. Patient education in the hospitals visited varied depending upon the quality of the public health nurse or others

concerned with this responsibility.

Another facility with eight physicians had 1,470 deliveries annually, for an average of 184 deliveries per physician. The staffing at that hospital was generally inflated. This unit was staffed by three military and 14 civilian registered nurses with two military nurses and six civilian nurses in the labor rooms. In the last five years the actual number of births in this hospital has slowly declined from 4.3 to 4.0 deliveries daily. Prenatal clinics handle 200 visits per day and each physician sees approximately 30 patients within a four-hour period. Problems at this facility related to the rapid personnel turnover.

A delay in developing a premature nursery at one hospital resulted in its poor location and construction. Monitoring was unavailable and overview by the nurses was inadequate.

A common problem at all facilities was the long clinic wait for OB-GYN appointments, particularly at prenatal clinics (as long as seven weeks). The dependents also complained about lack of comfort on the obstetrical wards and restrictions on telephone privileges and on the number of visitors allowed.

PEDIATRIC SERVICES

More uniformity appeared among the Pediatric Services in the facilities visited than in almost any other service rendered. In all cases, staffing and clinic facilities were adequate; the largest staff was seven pediatricians, all Board eligible, and the smallest was three pediatricians with one general medical officer.

The major volume of demand was in the outpatient department with well babies and children. All facilities had daily pediatric clinics, usually from 8:00 a.m. to 5:00 p.m.; the largest number of annual visits was 51,000, covered by the equivalent of five and one-half pediatricians. Two of the three facilities had both an appointment and a walk-in clinic system; the other had a daily walk-in clinic. These clinics provided diagnostic and therapeutic services, school physical examinations, and immunizations. The immunization clinic was run by nurses and corpsmen and did not directly involve the physician.

During daylight hours, emergencies were generally handled through walk-in clinics, and after hours by the emergency room. Only one hospital had an after-hours pediatric clinic, held in the early evening and staffed by a civilian physician. At all hospitals visited, pediatricians were also on consulting call to the emergency department; one Pediatric Service had a policy of reviewing all pertinent patient charts from the ER each morning to provide a general overview of Pediatric Services.

The inpatient facilities were similar at all institutions: single bedrooms to six-bed rooms for a total of 12 to 20 patients, except in one facility which had beds for 25 to 35 patients. These patients were generally evenly divided between the Pediatric and the Surgical Services (Urology and General Surgery).

At one hospital, a major reason for admission was "failure to thrive." Other reasons for admission were major allergies, neurological or neurosurgical problems, congenital deformities, and advanced pulmonary disease. With the exception of the one hospital already mentioned, cardiac problems requiring catheterization were usually referred to other military facilities.

In general, Pediatric Services handled problems very effectively in the clinic as well as the inpatient areas. Several problems common to all units visited were:

- Delays of several weeks to months in receiving laboratory reports in the clinic. At one BLHCS, pediatricians kept individual laboratory logs to ensure the availability of information on revisits.
- Large numbers of school physical examinations required in the months of August and September.
- Difficulty in maintaining voluntary immunization programs with such a mobile population.
- Consultation delays from other specialties such as Ophthalmology, Orthopedics, and Dermatology.
- Poor overview by the nurses of the premature nursery as well as regular, pediatric patient areas.

- No areas to isolate suspected contagious diseases in the pediatric clinic.
- No thermostatic control for several isolettes in one unit.
- No play areas for ambulatory children.

NEUROPSYCHIATRIC SERVICES

Neuropsychiatric needs varied widely in the three facilities visited. Two of the facilities combined in- and outpatient services while the third maintained a Psychiatric Unit in the dispensary system which was administratively unrelated to the hospital. Psychiatrists, particularly analysts, were used for consultation at all facilities to supplement the neuropsychiatric-therapeutic program.

The volume for psychiatric services was similar in the two recruit training centers, with the heaviest demands in problems of behavior, motivation, personality disorders, drug abuse, suicidal gestures, and psychiatric decisions relating to personnel awaiting military trial or other disposition actions. At one recruit center with approximately 10,000 personnel, the psychiatrists handled between 500 and 900 consultation requests per month from recruits and approximately 70 for non-recruits. Between 35 and 75 Board actions were processed monthly resulting in about five discharges, up to 25 hospitalizations, and between 30 and 60 admissions to the inpatient psychiatric ward for acute problems.

In all areas, psychotic problems, (e.g., schizophrenia) rarely exceeded one and one-half percent of all patients screened for such problems. One-half of these were acute and the balance chronic. The general policy was to treat the acute and to discharge or otherwise process the chronic psychotic problems. In the units servicing recruits the usual problem patient was 17 to 18 years old with a low level of education and a history of expulsion from school. All these individuals had a bad prognosis for completion of basic training.

In all units, psychiatric treatment was minimal as were all neuro-psychiatric services. For example, all chronic psychotics were transferred to treatment centers and dependent children were referred elsewhere without further assessment of care.

Psychiatric services were generally limited or unavailable including behavior therapy, prolonged or intensive psychotherapy, and occupational therapy. Observation rooms with two-way mirrors, and facilities for psychodrama and group testing were also inadequate. Electroencephalography, sonoencephalography, and other neurological tests were usually unavailable, requiring patient transfer to other facilities. Active psychiatric therapy was limited almost entirely to drugs. However, Amytal interviews were seldom carried out and Lithium therapy and shock therapy were not available. Only one mental hygiene consulting service facility was available in any of the three BLHCS visited and this was for military personnel only.

Psychiatrists had little time to treat dependents and retirees, and those with acute psychiatric problems presented particular difficulties because they were frequently not residents of the state. Subterfuge often had to be used to obtain help for these people by transferring them either to a county or local hospital, and from there, to a state mental institution.

At one facility, military psychiatric social workers were under the military command of the medical company commander. They were structurally within the social work service but functionally within the department of Neurology and Psychiatry; this was a difficult administrative arrangement. Physicians had to devote most of their time to Board and legal actions for the disposition of active-duty personnel, and they were often faced with delays in the completion of records. Patients spent approximately half their stay awaiting final Board action, which, in one institution, averaged 57 days. Dictation and paperwork required an average of an additional 35 days. Frequent problems were created by the unavailability of secretaries, and poor communications. In addition psychiatric services located in dispensaries lacked adequate libraries.

The number of military personnel receiving Board action for detachment from the Service seemed directly related to the psychiatrist's military experience. One Team member noted that the number of Board actions dropped

from 40 percent to less than 15 percent of the patients reviewed by psychiatrists as they became more familiar with the Military system and the legal aspects involved.

In summary, Neuropsychiatric Services are faced with a high demand for decision-making regarding competency, sanity, motivation, behavior, and related medical-legal actions. They must also set up mental health programs and deal with problems of drugs and alcohol. They, like other services are faced with increasing numbers of Military, dependent, and retiree outpatients. They must also serve as consultants to Command, law enforcement, legal personnel, clergy, schools and their fellow physicians.

DISPENSARY SERVICES

Perhaps no service in the Military Health Care System is more subject to professional controversy than the dispensary. Providing health services (preventive medicine and minor acute problems) for a generally healthy male population continues to be a problem for the civilian-oriented physician. The short-term reserve officer is generally poorly equipped to face the volume of minute and uninteresting medical problems of active duty servicemen who have been thoroughly screened for physical defects, are seldom seriously ill, and usually use the system only for minor health problems or to avoid active duty.

Dispensary generally provides two categories of services:

(a) Routine services by health personnel such as annual physical examinations or physical for recruits, immunization programs and sanitation inspections,

(b) Daily screening sick call requiring limited diagnostic and therapeutic capabilities.

Within the dispensary services, optician services were in extremely heavy demand. The number of spectacles and eye examinations performed exceeded 100,000 procedures annually and was frequently the largest volume of activity at many of the units.

Dispensary staffing varied: one was overstaffed with nine physicians providing services for a military population of 5,000 personnel annually, while another facility was understaffed with 13 physicians at four dispensaries to serve 50,000 transient recruits annually plus 3,000 regular military base personnel.

Physicians were supported largely by corpsmen and technicians who were permitted to make decisions such as sorting patients at sick call and transferring them to the hospital based upon routine criteria such as temperature over 100 degrees and overt infection of the skin. Corpsmen services also extended to suturing lacerations not requiring hospitalization.

Since much of the initial sorting of complaints in the dispensaries was performed by corpsmen, the physician's decision-making was minimal. He saw only about 10 to 15 percent of those reporting to sick call and was primarily concerned with making decisions on the presence of fractures and acute problems. He also might routinely see all service personnel reporting to the dispensary with a repeated complaint particularly for chest or abdominal pain, rash, or a neuropsychiatric problem. The corpsman also asked the physician to see a patient when he felt unable to handle a complaint adequately.

The podiatrist played a major role at the recruit center dispensaries since approximately half of the admissions to dispensary beds and one-half of the sick call visits were related to foot problems.

Mild epidemics were also a problem for dispensaries. As many as 100 upper respiratory infections with fever might be transferred to a hospital on a given day following screening by corpsmen. The management of the upper respiratory infection and meningitis required the dispensary to supervise recruits in a preventive antibiotic program.

Non-military activities are also a source of health care demands. Intramural football caused 60 injuries in one season which required 18 operations resulting in the medical discharge of five men. Consequently, the athletic program has been somewhat curtailed. Automobile accidents were also said to be high, although actual figures were not available.

Other sick call loads involved trauma such as knee injuries, back injuries, and fractures, and neuropsychiatric disorders primarily related to anti-social traits, personality disorder, and behavior problems. The latter was particularly high among the two-year enlistees. One Dispensary reported that 119 men in an 11-month period were screened by psychiatrists and 47 of them were sent to a higher echelon military hospital for admission and further study.

Problems at the dispensaries probably exceeded those anywhere else in the BLHC System. A major problem was the difficulty in maintaining records. At one small dispensary, two physicians and several corpsmen were required to make an estimated 36,000 entries in the immunization health records of 3,000 recruits processed in eight weeks. Because of record losses, duplicate and triplicate copies of almost all reports were kept. Another difficulty was in obtaining consulting and laboratory reports which were often delayed up to several weeks. Maintaining suspense files on immunization records for transients, including tuberculosis screening, also required considerable personnel time and effort. Many records were illegible and the copy machine often inadequate for processing discharges. In addition, records carried by military patients or recruits were often defaced or lost, delaying transfers, discharges, and other related movement of personnel.

Another frequent problem in dispensaries was poor coordination between consulting services and hospital-based specialists. When neuropsychiatric problems arose, for example, three months or more could be required to obtain action for discharge, therapy, or return to duty. Delivery of test results from hospital specialty clinics to the dispensary physician was often delayed; still further delays resulted when X-rays or other tests had to be redone due to record loss.

CONSULTATION SERVICES

Professional consultation services were basically available but erratic, and all hospitals appeared to suffer from the lack of available attending staff, particularly in scarce specialty areas.

One service had developed a national consulting service. This service was excellent in concept but poor in execution. The staff was composed of retired experts in the military service, chairmen of departments at medical schools, or other individuals of exceedingly high caliber and, as a result, they were not always available. Their contribution to the system was primarily philosophical support rather than actual assistance in day-to-day practice.

One Survey Team member observed a Chief of Service consulting with three prominent physicians from three different areas of the country about one patient. This type of consultation has generally evolved through personal relationships between military and civilian physicians, particularly through military physicians referring dependents and retirees to prominent civilian physicians.

QUALITY CONTROL

Although all military hospitals visited generally followed the basic recommendations and guidelines established by the Joint Commission on Accreditation of Hospitals, the Tumor Committee of the American College of Surgeons and others, no uniform approach presently exists for auditing the quality of civilian or military medical services.

Basic mechanisms of quality control are often performed mechanically. Tissue Committees, tumor boards, ward rounds, and conferences are held. Medical libraries existed in the three hospitals visited, but these were judged minimal by quality and quantity when compared to comparable civilian hospitals.

While administrative and professional staffs do not resist attempts to devise intensive self-audits, they do not always feel impelled to initiate such programs. This may be related to certain characteristics of the system and its regulations and policies. For example, few seriously ill patients are in the hospital at any one time, since patients with serious problems requiring special diagnostic studies or "high risk" surgery are transferred to other facilities. Terminal cases are very infrequent at these facilities and few autopsies are performed annually. In addition, the high personnel turnover undermines the process necessary for devising and implementing self-audits.

A number of Team observations suggested that insufficient attention was directed to quality control of services. No facility posted operating room regulations prescribing the management of anesthetic gases, sterility control, or preoperative requirements for admission to the operating room. Such procedures are particularly important considering the high personnel turnover and many of the requirements promulgated by the Joint Commission on Hospital Accreditation. The Team found no evidence of preventive maintenance on important equipment and almost all facilities had limited standby monitoring equipment.

As in many civilian hospitals, no attempts were made to audit whether admission diagnoses compared favorably with discharge diagnoses, and reports on the intermittent self-evaluation audits on problems, needs, and goals of service were generally not maintained to augment staff planning and efficiency programs.

RECOMMENDATIONS

The following recommendations are designed to improve the efficiency of professional services and to permit rapid incorporation of technological advances.

General Medical Services

- Improve patient care by developing patient education programs for outpatients, particularly at dispensaries. Patient education is also critically important for the quality of long range care for dependents and retirees.
- Improve physician effectiveness by:
  (1) Integrating diagnostic and therapeutic services through sophisticated communications technology.
  (2) Utilizing physician-assistants and nurses capable of handling many decisions in the clinic and dispensaries.
  (3) Reducing demands upon the physician-nurse team through new corpsmen-technician specialists such as the "barrack health master", monitoring specialists, and data analysts.
  (4) Establishing residency programs.

Surgical Services

- Improve health care by:
  (1) Expanding the participation of Allied Health Care Specialists such as podiatrists and optometrists.
  (2) Providing for a growing need for peripheral vascular surgery, now recognized in most 500 bed hospitals.
- Increase flexibility and personnel efficiency by:
  (1) Establishing greater stability for key personnel in such critical areas of the Surgical Service as the operating room, the post-anesthetic recovery room, and the ICU.
  (2) Instituting a "core" of surgical personnel to operate as a unit and provide group surgical practice for military hospitals. This group (comprised of the Chief of Surgical Services and Operating Room Nurse, and Surgical Technicians) would operate as a unit within the United States; would be disbanded to answer particular needs and demands overseas; and would regroup in the United States upon return. This approach would improve service through team compatibility and efficiency, greater diagnostic and therapeutic acumen based upon mutual support and working relationships, and provide a balance of surgical services, provided through additional concentrated training in all areas of surgery, i.e., neurosurgery, plastic surgery, pediatric surgery, etc. Greater patient care efficiency could be obtained in terms of providing these subspecialty services to those patients presently referred to Regional Centers.

Obstetrical and Gynecological Services

- Improve patient care by:
  (1) Including anti-rubella programs, anti-rh negative, and cancer detection surveys in preventive medicine clinics, utilizing the Nurse Clinician Program.

(2) Standardizing "expectant mother" clinics and other patient education programs through the services and making efforts to ensure 100 percent attendance.

(3) Expanding "Telephone Clinics" for OB-GYN.

(4) Maintaining premature nurseries in all obstetrical units with the same sophisticated monitoring and life-support systems used in the Intensive Care Unit.

(5) Applying monitoring and detection devices throughout pregnancy, including increased application of amniocentesis (with analysis of the constituents of the fluid), plasma and urine determinations of various substraits elaborated in pregnancy, the controlled induction of labor, the sequential monitoring of fetal acid base and gas exchange during labor and delivery.

Pediatric Services

- Increase flexibility and personnel efficiency by using pediatric assistants or nurse practitioners, increasing the use of ambulatory surgical care, and improving and developing the preventive treatment of neonatal and prenatal pediatric disease.
- Improve patient care and personnel efficiency by using laboratory oriented multiphasic testing for pediatric health problems.

Neuropsychiatric Services

- Increase flexibility and staff efficiency by locating a mental hygiene consultation service within a basic training area combined with outpatient services at the hospital or at a family practice clinic to provide for the total population.

- Improve patient care by developing a modular treatment center and using a treatment team of a psychiatrist, six corpsmen, one nurse, a social worker, a psychology social worker technician, an NCOIC or a Civil Service Administrator and a secretary to handle 10 to 12 patients per treatment area.

Dispensary Services

- Improve patient care by:
  (1) Providing an X-ray unit for diagnostic services to permit filming soft tissue and bone, and a laboratory to permit limited microbiologic or chemical determinations, in addition to routine blood and urine analyses.
  (2) Utilizing multiphasic testing and screening techniques wherever mass assessment is necessary.
- To increase flexibility and staff efficiency by:
  (1) Giving special training to the dispensary physician in the neuropsychiatric and orthopedic specialties to handle the high incidence of personality and behavior disorders, and orthopedic and musculo-skeletal problems among recruits.
  (2) Maximizing the role of the corpsmen and the nurse in decision-making; the dispensary may be entirely staffed by non-physician health personnel in the future, utilizing telecommunications to a hospital-based decision-making center to assist in patient assessment because of the increasing shortage of physicians.
  (3) Developing a Surgicenter concept for minor operations to reduce loads on the Central Hospital Unit. Corpsmen and other physician assistant personnel could assume the decision-making areas with more intensive training and improved technology.

(4) Rotating dispensary physicians to other hospital duties to avoid isolation. Experienced physicians should serve in the dispensary in addition to two-year reservists and draftees.

Quality Control

- Improve the quality of health care by:
  (1) Maintaining Tumor Boards, Tissue Committees, Death and Complications Conferences and similar staff assessments.
  (2) Establishing hospital utilization committees to assess facilities utilization.
  (3) Auditing all deaths occurring within 24 hours of admission.
  (4) Establishing annual reports by discipline and service with reference to deaths and complications and supported by appropriate self-audit conferences.
- Improve the quality of personnel by:
  (1) Focusing more attention on staff education and development, including more liberal regulations on attending national and specialty meetings for professional personnel and improved libraries.
  (2) Posting regulations and procedures in the operating room.

Consultation Service

- Provide an audio-visual two-way communication (consulting) system between an area university medical center and one or more BLHC Systems* to improve the breadth and depth of services and to assist in meeting emergency problems such as head injuries, extensive reconstructive problems, etc.

---

* Reference - University of Wisconsin Two-Way Slow Scan/Audio System.

4.4 ADMINISTRATIVE SERVICES AND HEALTH RECORDS

ADMINISTRATIVE SERVICES

Administrative services in the facilities visited could be divided into two major areas: (1) sections or divisions headed by physicians, serving as a Commanding Officer, Executive Officer or Chief of Professional Services, and (2) those services headed by medical service corps or medical specialty service personnel such as Director of Hospital Services, Administrative Officer, Chief Pharmacist, or Chief of Physiotherapy.

The Team felt that Commanding Officers were not always appointed because of their capabilities or even their interest in administration. However, physicians generally can only achieve top rank through major administrative responsibility, such as hospital or dispensary Commanding Officer, District Medical Officer, Commanding Officer of MEDDAC or headquarters staff.

The Medical Service Corps was of high caliber in all the facilities visited. Several Administrative Officers, graduates of hospital administration programs, were supported by administrative assistants with supervisory responsibilities at related clinics and other hospital sections. However, not all of these supporting administrative positions were filled and, as a result, pharmacists at one institution were required to perform extra administrative jobs such as supervising "special" hospital services. This lack of supporting administrative personnel particularly affected clinic operations, discharge centers, and dispensaries. Since only a few physicians are assigned to these areas, much greater demands are placed upon corpsmen and administrative personnel.

Administrative and clerical support is apparently weak for Board Actions on service detachment for medical and related reasons, this contributes significantly to the long delays in completing these actions. Personnel turnover frequently makes the productivity of service chiefs and their sections somewhat erratic and inconsistent.

The high turnover is also a problem with young physicians, who enter under the Berry Plan, and generally stay no longer than two years. They report to the hospital with advanced training and experience in newer diagnostic and therapeutic techniques and burden the administration with demands for new equipment, space changes, and other alterations, without attempting to establish priorities.

For advancement to general rank, career officers in the Air Force Medical Service must have additional qualifications such as a Flight Medical Officer. However, not all physicians wish to engage in this extracurricular activity, and the career value of the clinician who does not receive "flight" status is depreciated. If the military becomes a voluntary service program, such overlapping special military roles may have long-term deleterious effects on physician recruitment.

The complexity of administrative responsibilities varied from service to service. The Naval hospital was unrelated administratively to the dispensary systems of the associated training base. At the Army hospital, administrative and support responsibilities under MEDDAC extended over several hundred square miles including 19 individual military stations and supervision of veterinary and dental services, and reserve training units, in addition to directing traditional hospital and clinic activities. This administrative role brings all medical activities under the command of a health officer and seems preferable to that of having related medical units under different military commanders.

Certain board administrative policies created distressing fluctuations in patient loads. For example, the requirement that all inductees with upper-respiratory infections or temperatures over 100°F must be hospitalized, placed enormous demands upon the hospital services. Fear that patients with meningitis might be overlooked without a blanket screening system has disrupted the hospital and overloaded many of its services. The military services continue to devote much time, research, and attention to meningitis control. However,

it is unfortunate that administrative decisions based upon public opinion create hospital admission policies which effect the efficiency of the physician staff and supporting personnel.

Administrative needs included efficient and uniform systems for reporting the status of health patterns, operations, and experience. The Team was continually hampered by the lack of annual reports on services and activities at all levels. At one facility, a reportedly excellent bimonthly professional activities report had been developed over the years but had been recently discontinued. The Chief of Surgery at this facility felt that the document had been very helpful in planning and retrospective assessment, and during the interview he was clearly embarrassed at his inability to provide pertinent information formerly contained in this publication. While the reasons for discontinuing this report were not entirely clear, a lack of communications between key professional personnel, the Commanding Officer and administrative personnel, or even higher levels in the service is indicated.

Of major concern, to both hospital and clinic staffs and the Team, was the difficulty in developing an effective clinic apointment system. The waiting time for an Outpatient Clinic appointment was as long as six to eight weeks, although diligent efforts by physicians at one clinic reduced this time to four or five days.

Centralized appointment systems had evolved at two of the facilities to meet this problem. The system had deteriorated in some areas, however, because it could not accommodate the demands of scheduling, cancellations, and rescheduling for all clinics. It also lacked the flexibility to adjust to various clinic loads, and the specialty clinics often circumvented the system by developing separate policies systems. Overall, the lack of uniformity in the management of central appointment desks, and the many changes that had occurred since their inception, indicated that more effort is needed to improve their efficiency. The Team agreed that the concept of a centralized appointment system remote from the general clinic area was basically sound.

Few of the hospitals visited seemed to have effective working relationships with either their local civilian hospitals or the next echelon of military service hospital. This was particularly apparent in emergency cases; for example, injured service personnel are frequently transferred from a civilian hospital to the military hospital without pre-treatment.

Programs for effective working relationships between military hospitals also seemed absent. Physicians often arranged for transfer, care and even consultation for dependents by telephone calls to personal friends on the staff of other military hospitals, rather than by administrative direction. This was particularly true where the military hospital does not have complete specialty staffing (pediatric, cardiovascular or neurosurgical). Almost all physicians concerned with the transfer of acutely ill patients mentioned the problems and delays caused by the loose arrangements between these military hospitals. Since these problems existed in an area with several well-staffed federal hospitals, they would seem easily correctable.

HEALTH RECORDS

Although the administration of medical and health records for service personnel, dependents, and retirees is one of the most important activities in the Medical Health Care System, it is also one of the weakest. At almost every level of health recording, numerous delays and errors are not only possible, but predictable and tolerated.

Problems in health recording can be divided into five major areas: (1) the mechanics of compiling and maintaining health records; (2) multiple inpatient and outpatient records; (3) transferring records from one installation to another; (4) filing and retrieving records; and (5) special health records.

Inadequate staffing was probably the principal cause of record compilation and maintenance problems. Record rooms suffered from insufficient numbers of medical record librarians and the high turnover of on-the-job trainees, volunteers, and other personnel.

As a result, additions to health records such as X-ray reports, laboratory reports, and consultations are often delayed a month or more. Delays up to several weeks also occurred in outpatient departments. Not only does this delay physician diagnosis, but patients and servicemen often become separated from their records. In one discharge center, the suspense file was cluttered with incomplete records because the activity or personnel involved did not always return the consultation reports, leaving records of their separation from the Service incomplete.

Since inpatient and outpatient records are maintained separately and records of visits at other military bases are also maintained separately, record multiplicity is a major problem. An individual can accumulate extensive health records dispersed throughout the country and abroad. The costs of duplicating diagnostic services and consulting hours underscores the weakness of the current system which does not utilize the central medical record data system.

With the exception of basic health records, maintained in the dispensary or the attached medical facility, inpatient and outpatient records do not always accompany an individual when he is transferred. Because of the rate of health record losses, active duty military servicemen generally carry their health records from station to station. Although a hospital summary of previous records is prepared when a serviceman is hospitalized, records are retained at the initial hospital. Dependents' records are not transferred when they accompany servicemen to another base unless specifically requested. Dependent inpatient records remain in the hospital for five years and are then sent to a central depot (St. Louis) for ultimate filing. Summaries on inpatient records reportedly take several months to appear in the outpatient records of both dependents and service personnel.

Record retrieval was a common problem in all units visited, particularly access to charts and other history material. Automated document retrieval systems at one facility were slow, permitted only one individual to search for a chart, and required frequent servicing. Evening personnel required nearly

the entire shift to assemble charts for the following day (1,000 individual charts). Transient personnel, volunteers, on-the-job trainees, and patient workers compounded filing problems.

Special Health Records were maintained at each installation; for example, all Air Force personnel on flight status had a separate clinic and a separate record room unrelated to the hospital or the other outpatient service systems. At one installation health records for inductees were in the Emergency Department rather than at the dispensary.

Record completeness and quality varied from poor to excellent. Of the number of the charts reviewed by the Health Team, only 10 percent of the records had what might be considered major deficiencies. All records used standard governmental forms but numerous improvised inserts appeared in the records. These were not standardized and reflected local policies such as forms for the intensive care unit, discharge clearance slips, and laboratory forms for new tests.

Chart work done by physicians including operative notes, pertinent physical findings, and consulting opinions was of unusually high caliber for the type of patient being cared for and considering demands upon the physicians' time. However, the long-standing requirement that physicians hand-write notes and opinions has led to delays in charting and consulting opinions.

RECOMMENDATIONS

Administrative Services

- Improve personnel utilization and staff efficiency by:
  - (1) Providing specialized administrative training programs for all officers, including graduate training and continuing education training programs.
  - (2) Stabilizing command, supervisory and staff assignments to ensure continuity of hospital and health care system operation.

(3) Placing the total health care system — clinic, dispensary, hospital — under a single command and maintaining administrative assessment at all levels, including dispensaries, clinics, hospitals and related commands.

- Improve patient care by:

  (1) Developing more efficient and effective echelons of progressive medical care among all service hospitals for diagnostic and therapeutic services. These arrangements should facilitate transfer and consultation services with essentially little or no delay in meeting patient needs.

  (2) Developing and organizing family clinics for dependents and retirees with administrative overview.

- Increase flexibility and staff efficiency by:

  (1) Developing a computerized, centralized and standardized data-collection system for major elements in the Base Level Health Care System.

  (2) Developing computerized central appointment systems for clinics and outpatient services which can handle rescheduling, cancellations, and other varying demands upon the system while allowing flexibility for individual clinics.

Health Record

- Increase flexibility and efficiency by:

  (1) Maintaining outpatient and inpatient records of dependents and retirees in a Central Data Bank with computerized and standardized medical information for every individual under the Military Health Care System.

(2) Converting all filing systems to the terminal digit with color coding.

(3) Employing trained record room librarians to oversee the health record system.

(4) Exploring the development of a worldwide health data bank to permit complete assessments of health care trends, the development of preventive medical programs, and to determine health needs and costs on a much more accurate and efficient basis than currently possible. This might be developed jointly by the military services and the Veterans Administration.