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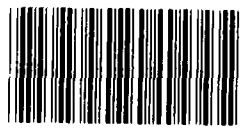
BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Better Guidelines Could Reduce VA's Planned Construction Of Costly Operating Rooms



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The Veterans Administration's criterion for surgical facilities in new or replacement hospitals -- 1 operating room for every 28 surgical beds -- results in too many operating rooms. The VA guideline fails to consider that some occupants of surgical beds do not undergo surgery and the time needed to perform a surgical procedure varies according to the type of surgery and the experience of the surgeon.

In this report, GAO presents a model for determining the number of operating rooms required in a surgical suite. The model uses actual workload data, thereby taking into account each facility's unique combination of surgical procedures and surgeon experience.

By staffing only the operating rooms needed to support the workload, better use can be made of nursing staff. Additional cost savings can be realized by using less skilled personnel to carry out many nonprofessional tasks now handled by operating room nurses.

HRD-81-54
MARCH 3, 1981

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-202047

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on why the planning methodology the Veterans Administration uses to determine the number of operating rooms for new and replacement surgical suites should be improved.

Copies of this report are being sent to the Director, Office of Management and Budget, and the Administrator of Veterans Affairs.

Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

BETTER GUIDELINES COULD REDUCE VA'S PLANNED CONSTRUCTION OF COSTLY OPERATING ROOMS

D I G E S T

As part of its construction program, the Veterans Administration (VA) is planning to spend more than $1 billion to replace 10 of its medical centers. Each replacement center will have a surgical suite--among the most costly hospital departments to construct and operate.

In reviewing operating room utilization at 10 VA centers, including one--Minneapolis--that VA intends to replace, GAO found that, on the average, the 74 operating rooms at these centers were idle about 50 percent of the time they were available for scheduled surgery. Most of these centers were built many years ago, and VA does not know what criterion was used for planning these operating rooms. VA's current planning criterion calls for 1 operating room for every 28 surgical beds. However, continued use of this criterion could result in overconstruction of operating rooms with resulting low utilization.

In developing its criterion, VA did not recognize that all patients admitted to surgical beds do not undergo surgery. Moreover, VA did not fully recognize the significant variations among medical centers in (1) the type of surgical procedures performed (i.e., surgical mix) and (2) the length of time different surgical procedures take. Instead, VA adopted a planning criterion that GAO believes focuses on the wrong measure--surgical beds rather than surgical workload. (See pp. 3 to 7.)

Many patients admitted to surgical beds in VA medical centers do not undergo surgery. Some develop medical complications that preclude surgery, others are admitted for diagnosis or nonsurgical treatment, and still others decline surgery.

Average operating times varied significantly among VA medical centers, particularly between centers affiliated with medical schools and nonaffiliated centers. On the average, surgical procedures generally performed by medical school

residents at affiliated centers took longer than similar procedures performed by VA staff at nonaffiliated centers. For example, urological procedures averaged 29 minutes at nonaffiliated centers and 56 minutes at affiliated centers. Similarly, the surgical mix at affiliated and nonaffiliated centers varied widely.

GAO developed a model for planning operating rooms which focuses on the unique surgical workload characteristics of each VA center. When this model was applied to a 20-day test period at the 10 centers GAO reviewed, it showed that VA could have handled the surgical workload with 48 operating rooms--22 fewer than if VA replaced these facilities using its current criterion. In the case of the Minneapolis medical center, which VA originally planned to replace with 12 operating rooms, GAO's model showed that only 7 rooms were required. Overall, GAO estimated that applying its model to the 10 centers reviewed could save about $3.5 million in potential replacement construction and equipment costs. (See pp. 8 to 17.)

GAO's analysis of actual surgical workload requirements showed that VA assigned more operating room nurses than needed to handle the surgical workload. This overstaffing resulted because VA has too many operating rooms. On the average, the operating room nurses at the 10 centers reviewed spent about half of their on-duty hours performing activities not directly related to the surgical suite.

GAO believes that, if VA would assign operating room nurses in accordance with the number of rooms actually needed to handle the surgical workload, nursing staff productivity could be increased and distribution of nursing positions could be improved at VA medical centers. Also, certain savings could be realized if VA made use of less skilled personnel to do many of the nonprofessional tasks now handled by skilled operating room nurses. (See pp. 22 to 27.)

RECOMMENDATIONS TO VA

The Administrator of Veterans Affairs should direct the Chief Medical Director to:

--Discontinue use of VA's current operating room planning criterion in favor of a planning methodology based on surgical workload for new or replacement operating rooms similar to the one GAO developed, with the aim of achieving an 80-percent operating room utilization level.

--Use operating room estimates obtained from GAO's model, or a similar workload model, to reassess the number of operating rooms needed at the Minneapolis VA Medical Center and use such a model for all future construction proposals submitted to the Congress.

If, in VA's judgment, more operating rooms are needed than called for by the workload model, the Chief Medical Director should be required to justify the additional rooms.

--Develop staffing guidelines for operating room nurses based on the number of operating rooms needed to handle the surgical workload.

--Better use skilled operating room nurses by assigning nonprofessional tasks to less skilled personnel.

RECOMMENDATION TO THE CONGRESS

Construction of new or replacement surgical suites in VA medical centers is not cost effective if operating room requirements are based on VA's current criterion. The Congress should not approve any funding requests for new or replacement surgical suites in VA centers based solely on room-to-bed ratios, unless the planning is so far along that adjusting the surgical suite(s) planned would not be economically feasible.

AGENCY COMMENTS

VA generally agreed with the concept of and the need to develop a planning model based on surgical workload but expressed several reservations about the use of GAO's proposed model. GAO believes that VA's reservations regarding

the proposed planning model for operating room construction are generally unfounded. (See pp. 18 to 21.)

VA generally agreed with GAO's recommendations to improve operating room nurse staffing and productivity. (See p. 27.)

Contents

ABBREVIATIONS

CASH	Commission for Administrative Services in Hospitals
GAO	General Accounting Office
PFD	personal time, fatigue, and unavoidable delays
VA	Veterans Administration

CHAPTER 1

INTRODUCTION

The Veterans Administration's (VA's) Department of Medicine and Surgery is reponsible for ensuring complete medical care and services (including surgery) for eligible veterans, primarily through the largest centrally directed health care system in the Nation. In fiscal year 1979 the VA health care system was composed of 172 medical centers, one independent domiciliary, and 49 satellite or independent clinics. All VA medical centers provided hospital and outpatient care, 92 operated nursing home care units, and 15 operated domiciliaries. During the year, VA provided care to about 1.3 million hospital patients, over 49,000 nursing home patients, and over 27,000 domiciliary patients. In addition, over 17 million visits were made for outpatient medical care--15 million to VA staff and 2 million to fee-basis physicians. VA's fiscal year 1979 medical care budget was about $5.3 billion, of which $908 million (17 percent) supported surgical service activities in VA medical centers.

VA SURGICAL SERVICES

At the end of fiscal year 1979, surgical services were provided in 136 VA medical centers, containing over 18,000 surgical beds and 900 operating rooms. At these centers, the core of the surgical suite consists of the operating rooms, recovery room facilities, surgical intensive care units, and other surgical support areas.

In fiscal year 1979 over 276,000 surgical procedures, ranging from routine diagnostic procedures to open-heart surgery and kidney transplants, were performed in VA medical centers. VA's surgical physician staff consisted of full-time surgeons, members of affiliated medical school faculties or surgeons in private practice who held part-time appointments with VA, and medical school residents.

PLANNED CONSTRUCTION OF SURGICAL OPERATING ROOMS

In VA's 5-year medical facility construction plan (fiscal years 1980-84) issued in August 1979, VA included 10 total hospital replacement or construction projects with a combined estimated construction cost of over $1 billion. Each of these 10 replacement projects will have surgical suites. While detailed cost estimates for the surgical operating rooms planned for these projects are not available, current literature indicates that surgical operating rooms are among the most costly hospital departments to construct and operate.

OBJECTIVES, SCOPE, AND METHODOLOGY

The objectives of this study were to:

--Determine the extent of utilization of operating rooms in VA medical centers with surgical suites.

--Evaluate VA's planning process for determining the number of required operating rooms in new and replacement surgical suites.

--Evaluate the productivity and utilization of operating room nursing staff in VA surgical suites.

We reviewed the surgical services at 10 VA medical centers--Albany, New York; Albuquerque, New Mexico; Batavia, New York; Cheyenne, Wyoming; Denver, Colorado; Long Beach, California; Minneapolis, Minnesota; New York, New York; Prescott, Arizona; and Wadsworth, California.

In selecting the medical centers for detailed audit, our goal was to cover centers affiliated with medical schools and nonaffiliated centers of various sizes and with wide geographic differences. At the time of our review, the Albuquerque, Batavia, and Prescott centers were not affiliated with a medical school, while the other seven centers were. VA Central Office Surgical Service officials stated that the 10 centers reviewed were representative of surgical services in the VA health care system.

At each of the 10 centers, we examined records pertaining to surgical procedures scheduled and performed during the centers' normal 8-hour day for the 20-day period from April 16 to May 11, 1979 (weekdays only). This period was selected with the concurrence of VA Central Office officials, because it offered a good example of the centers' normal surgical workload unaffected by holidays, summer staff turnover, and seasonal patient demand. Analysis of the surgical workload data showed that the workload during the 20-day test period we selected exceeded or closely approximated that of similar periods during 1979 at each of the centers reviewed.

We spoke with officials at the VA Central Office in Washington, D.C., and at each center we visited. In addition, we reviewed pertinent reports, records of hearings, publications, and documents obtained from VA, research libraries, individual authors, and the U.S. Government Printing Office.

We did not review the quality of patient care at the 10 centers.

CHAPTER 2

TOO MANY OPERATING ROOMS EXIST: BETTER PLANNING IS NEEDED

The 10 VA medical centers we reviewed had more surgical operating rooms than they needed to handle their surgical workload. The 74 operating rooms at these centers were, on the average, used about 46 percent of the time available for scheduled surgery. The utilization levels of these rooms ranged from 16 percent at the Cheyenne center to 74 percent at the Long Beach center.

If VA continues to use its current planning criterion for new or replacement operating rooms, further overconstruction with low utilization may result. We believe that, in developing its criterion, VA did not fully recognize significant differences among centers in the mix of surgical procedures and in the time to perform various procedures. Instead, VA established a criterion of 1 operating room for every 28 surgical beds.

In our opinion, VA's current criterion focuses on the wrong measure--surgical beds rather than surgical workload. To improve VA's planning for operating room requirements, we developed a model which focuses on the unique surgical workload characteristics of each VA medical center. Our model is designed to achieve higher utilization of operating rooms and provide a means through which construction and equipment costs can be minimized for operating rooms planned for new construction or replacement. For example, VA plans to replace the Minneapolis medical center, which under VA's planning criterion originally called for 12 operating rooms. If our model were applied to this center, only seven such rooms would be required. Overall, applying our model to the 10 medical centers reviewed showed that only 48 operating rooms would be needed--22 fewer than called for if VA planned to replace these facilities using its current criterion. Using VA cost estimates, we computed that applying our model could provide savings amounting to about $3.5 million in potential construction and equipment costs at these 10 centers.

OPERATING ROOM UTILIZATION AT CENTERS REVIEWED WAS LOW

Based on our analysis of surgical procedures performed during the 20-day test period--April 16 to May 11, 1979 (weekdays only)--the 74 operating rooms available for use at the 10 centers reviewed were, on the average, idle about 54 percent of the time. The number of operating rooms available for use and the utilization levels by center are shown on the following page.

VA medical center	Number of operating rooms available for use	Percentage of actual utilization	Average number of rooms idle each day
Albany	10	31.1	6.9
Albuquerque	8	33.5	5.3
Batavia	4	25.0	3.0
Cheyenne	2	16.1	1.7
Denver	8	55.6	3.5
Long Beach	8	74.4	2.1
Minneapolis	9	63.6	3.3
New York	12	37.8	7.5
Prescott	3	34.8	2.0
Wadsworth	10	54.9	4.5
	74	a/46.35	39.8

a/Average actual utilization for 10 centers reviewed.

DEVELOPMENT AND SHORTCOMINGS OF VA'S PLANNING CRITERION

According to Central Office officials, VA generally plans its medical center support functions, including surgical suites, based on the number of constructed beds. Accordingly, in 1976 VA established a planning criterion for surgical suites which calls for 1 operating room for every 28 surgical beds. In developing its criterion, VA analyzed the surgical workload of 30 medical centers for a 3-month period in 1975. As a result of this analysis and the development of expected annual workloads for these centers, VA determined that 2.5 surgical procedures would be performed daily in each operating room of a surgical suite. In making its determination, VA assumed that 1 operating room would support 28 surgical beds at an 85-percent occupancy rate and a 14-day length of stay. In addition, VA assumed that all patients admitted to surgical beds would have surgery. .

As discussed below, VA's 1976 planning criterion for operating rooms does not consider factors, which vary from center to center, that significantly affect the decisionmaking process for operating room planning.

Not all surgical bed patients have surgery

In developing its planning criterion, VA assumed that all surgical bed patients have surgery. However, many patients admitted to surgical beds in VA centers do not. Some patients develop medical complications that preclude surgery, others are admitted to surgical beds for diagnosis or nonsurgical treatment, and still others decline surgery.

Our review of medical records for 1,907 patients discharged or transferred in May 1979 from surgical beds at the 10 centers reviewed showed that 562 patients (29.5 percent) did not have surgery. A similar observation was made by the National Academy of Sciences in a 1977 report, 1/ which stated that no surgery was performed on 47 percent of the patients discharged from VA surgical beds in fiscal year 1975. In its report, the Academy pointed out that, unlike private hospitals, VA medical centers lack a comparable system whereby patients are admitted to a surgical service only on referral by a physician who has already determined that surgery is appropriate. In VA centers, the decision to hospitalize, and in which bed section, is often made by the admitting physician on the basis of limited information. According to the Academy, if a tentative diagnosis was made for which surgery may be appropriate, the patient was likely to be admitted to a surgical ward. Since nearly half of the patients admitted to VA surgical beds were discharged in fiscal year 1975 without surgery, the Academy noted that for many patients hospitalization may not have been necessary or that initial assignment to a medical service would have been more appropriate.

Surgeon experience and surgical mix affect average operating times

Average operating times by surgical procedure vary among VA centers because of each center's unique mix of surgeon experience and surgical workload. VA's 1976 operating room planning criterion makes no allowance for these variations.

We recognize that some of the differences in operating times between affiliated and nonaffiliated centers may be due to differences in the kinds of surgical patients treated. Centers affiliated with medical schools generally treat more surgical patients with severe medical conditions, often accompanied by multiple and chronic illnesses that complicate surgery and extend operating times. In contrast, operating times are usually shorter at nonaffiliated centers, where surgical patients generally have less severe problems and fewer complications.

1/"Health Care for American Veterans" (June 1977).

At the 10 centers we reviewed, the average operating times varied widely, particularly between affiliated and nonaffiliated centers. On the average, surgical procedures at affiliated centers--where most surgery was performed by medical school residents--took longer to perform than similar procedures performed by VA staff physicians at nonaffiliated centers. For example, hernia operations 1/--a common procedure at both types of centers--averaged about 55 minutes at the three nonaffiliated centers and 84 minutes at the seven affiliated centers. In another example, urological procedures averaged about 29 minutes at the nonaffiliated centers and about 56 minutes--almost twice as long--at the affiliated centers. The following table shows that such differences prevailed for most categories of surgery performed at the affiliated and nonaffiliated centers we reviewed.

Average Operating Time by Surgical Procedure at 10 VA Medical Centers

Type of surgery	Affiliated medical centers			Nonaffiliated medical centers		
	Number of procedures	Percentage of procedures	Average time per procedure	Number of procedures	Percentage of procedures	Average time per procedure
			(minutes)			(minutes)
Vascular/cardiac	186	9.7	187	3	1.1	177
Thyroid/thymus	16	.8	160	0	.0	-
Neurosurgery	60	3.1	156	2	.7	49
Abdominal	245	12.8	125	76	28.5	40
Oral	50	2.6	124	2	.7	16
Thoracic	107	5.6	119	16	6.0	44
Otolaryngology	157	8.2	100	9	3.4	19
Breast	7	.4	96	1	.4	24
Orthopedic	286	14.9	93	25	9.4	19
Ophthalmology	156	8.1	73	5	1.9	27
Plastic	153	8.0	71	40	15.0	23
Gynecology	7	.4	68	0	.0	-
Urology	439	22.9	56	76	28.5	29
Proctology	46	2.4	55	12	4.5	21
	a/1,915	b/100	99	a/267	b/100	32

a/Actual number of surgical procedures performed from April 16 to May 11, 1979 (weekdays only).

b/Total does not add to 100 percent due to rounding.

1/Included in the abdominal category in the table on this page.

Some surgical procedures require more time than others. In this regard, the above table shows that affiliated centers tend to do more time-consuming procedures than nonaffiliated centers do. For example, vascular and cardiac procedures made up almost 10 percent of the operations performed at the affiliated centers but only about 1 percent at the nonaffiliated centers.

We recognize that differences in patient population characteristics, if proved significant, could limit the comparability of average operating times between affiliated and nonaffiliated centers. However, the data in the table on page 6 clearly show that average operating times vary significantly among centers, particularly between affiliated and nonaffiliated centers.

Daily surgical workload varied among centers reviewed

In developing its 1976 planning criterion, VA applied a constant daily surgical workload factor of 2.5 procedures for each operating room. However, during the 20-day test period, the actual number of procedures performed daily in each operating room at the 10 centers reviewed ranged from 0.9 to 2.2, as shown below.

Surgical Procedures per Operating Room

VA medical center	Number of procedures (note a)	Number of existing operating rooms	Average number of procedures per room per day
Albany	223	10	1.1
Albuquerque	169	8	1.1
Batavia	109	4	1.4
Cheyenne	36	2	.9
Denver	257	8	1.6
Long Beach	344	8	2.2
Minneapolis	302	9	1.7
New York	333	12	1.4
Prescott	122	3	2.0
Wadsworth	287	10	1.4
	2,182	74	1.5

a/Actual number of surgical procedures performed from April 16, to May 11, 1979 (weekdays only).

We believe that using a constant workload factor tends to lead to inaccuracy because of its insensitivity to variations in surgery mix and the time taken to perform various surgical procedures in different hospitals.

USE OF SURGICAL WORKLOAD AS BASIS FOR DETERMINING OPERATING ROOM REQUIREMENTS

Unlike VA's current planning criterion for operating room requirements, we developed a model that recognizes the unique factors that affect surgical workload at each VA center. Our model provides a better measure of operating room requirements because it focuses on actual surgical workload rather than VA's indirect measure--surgical beds. Our model also recognizes that not all patients admitted to a surgical bed have surgery and considers the effect of each center's surgical mix and surgeon experience. Our model and its application are discussed below.

GAO model for determining operating room requirements

To compute the number of operating rooms, we developed the following planning model:

$$\text{Number of operating rooms} = \frac{\text{Number of procedures per day} \times [\text{Average hours per operation} + \text{Room preparation and cleanup time}]}{8 \text{ hours} \times \text{Expected utilization rate}}$$

Our model can apply to any period--a year, or a sample of several weeks--that provides representative workload data. As shown, our model is set up for daily averages. However, it can easily be modified to fit any period of time by adjusting the denominator. The basic strength of this approach is that with two workload measures--number of surgical procedures and average operating times--it recognizes the unique characteristics of each VA medical center.

Should a degree of precision be needed beyond that offered by overall statistical averages, our model can be adapted to stratification of the workload data. For example, if VA planners need to know if an open-heart surgery workload is enough to justify a special-purpose operating room, our model can be set up to include only the workload data pertinent to such surgery.

Our model can also be used for historical or projected data. For example, if a replacement surgical suite is to be built and no significant changes are planned in the surgical mix or the share of surgery done by residents, then our model, using historical workload data, can provide a reliable indicator of the number of operating rooms needed. In addition, our model can use estimated anticipated workload data to estimate operating room requirements for new centers where no historical information is available. If, for example, a new center is to be closely affiliated with a medical school, the surgical workload and

number of operating rooms required to meet the workload could be estimated by analyzing actual workload data at existing VA affiliated centers similar in size and mission to the planned new facility.

To compute the average operating times, we obtained information from VA's Operation Report (Standard Form 516) or from worksheets used to prepare the form. For each surgical procedure the anesthesia and surgery starting and ending times are recorded on the form. Generally, the sequence of recorded times is: (1) anesthesia begins, (2) surgery begins, (3) surgery ends, and (4) anesthesia ends. To compute average operating times, we used the longest recorded times--usually the elapsed time between the starting and ending of anesthesia. For operations that did not involve anesthesia, we used actual surgery times.

In developing our model, three elements were not derived from actual workload data--room preparation and cleanup time, the 8-hour workday, and the expected 80-percent utilization level. (The photograph on the following page depicts key events occurring in a VA surgical suite.) Room preparation and cleanup times were not recorded at the 10 centers reviewed; however, we believe that this time should be counted toward operating room utilization. To compensate for the lack of historical data, we developed information to arrive at a reasonable average estimate of room preparation and cleanup time, and added it to the historical average operation times. The 8-hour day was based on VA's practice of scheduling its elective (nonemergency) surgery during the main day shift hours. The expected utilization level we used--80 percent--is a factor for estimating what portion of each day the operating rooms should be in use. Our literature research showed that many authorities consider 80 percent to be an optimal utilization level for operating rooms.

Factor for room preparation and cleanup

Our model includes a factor of 30 minutes for each surgical procedure for preparing the operating room for surgery and for cleaning up afterwards. We believe this time should be added to the actual anesthesia or surgery times to provide a more reasonable measure of average operating times. We concluded that 30 minutes per operation represents a conservative, reasonable standard for preparation and cleanup, based on the following:

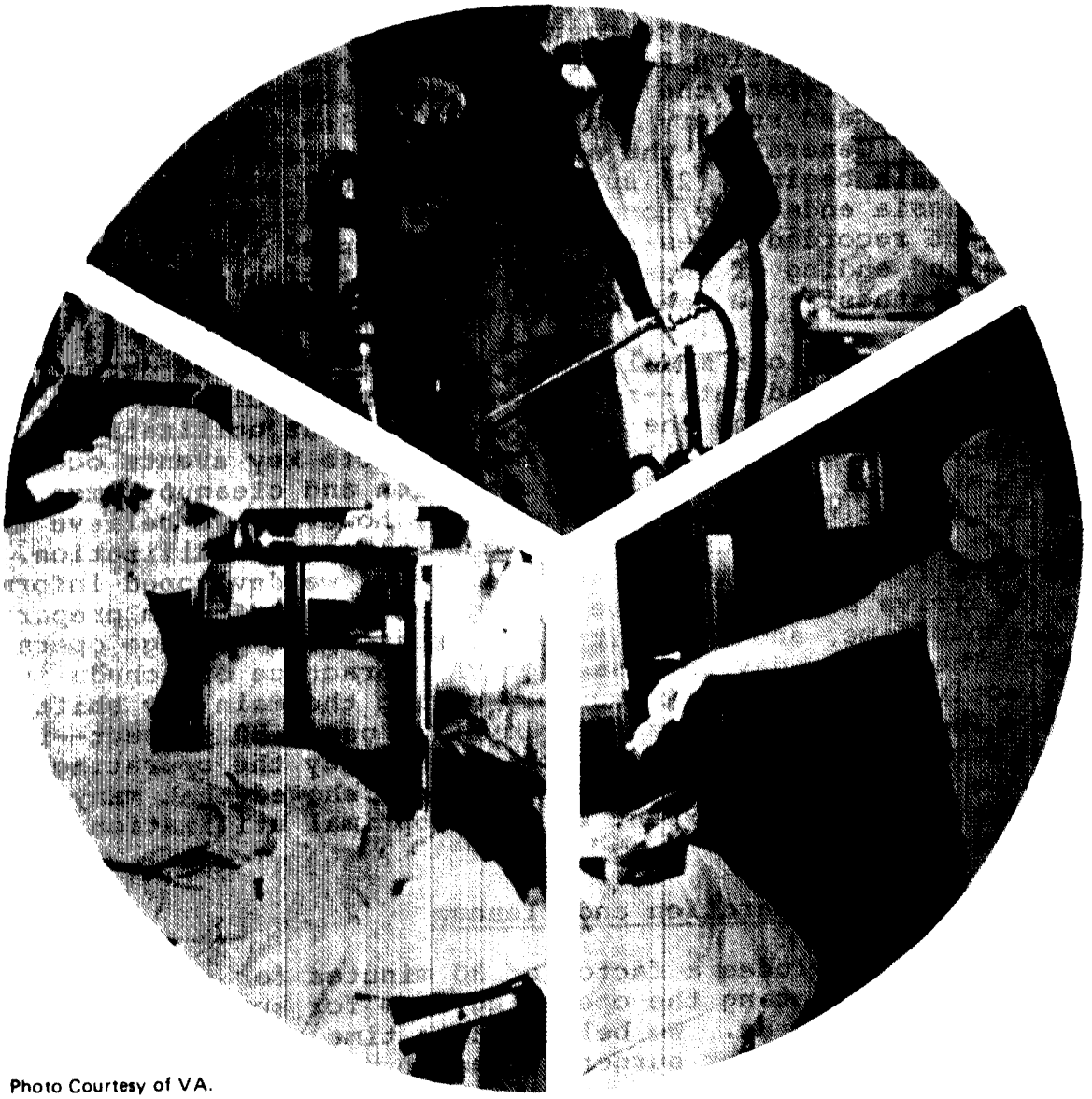

Photo Courtesy of VA.

SCENES IN A VA MEDICAL CENTER OPERATING ROOM. Clockwise From Lower Right: Preparing For Surgery; Performing a Surgical Procedure; and Cleaning Up After Surgery.

Room utilization study, Long Beach VA hospital

During December 1978 and January 1979, the operating room nursing staff at the Long Beach VA Medical Center kept logs of elapsed times between key events before, during, and after each surgical procedure. The information contained in those logs indicated that, on the average, it took about 13 minutes to prepare the operating room for surgery and about 17 minutes for cleanup.

Chicago Hospital Council study

In a 1974 study of operating room resource utilization, 1/ the Chicago Hospital Council developed average preparation and cleanup times for the 44 most frequently performed procedures at 10 Chicago area hospitals. Of a total sample of 8,034 operations, only 328 had combined preparation and cleanup times that exceeded 15 minutes. The other 7,706 operations sampled (96 percent) had a combined room preparation and cleanup time of 15 minutes or less.

The Commission for Administrative Services in Hospitals

The Commission for Administrative Services in Hospitals (CASH), a hospital administration consulting firm in Santa Ana, California, developed time standards for evaluating the operating room activities of client hospitals. For room preparation and cleanup, the standard times developed by CASH varied by length of the operation, as shown below.

Length of operation	Standard times for preparation and cleanup (rounded)
	(minutes)
Under 1 hour (minor case)	27
1 to 3 hours (major case)	41
Over 3 hours (extended major case)	67

1/Rinde, S., and Blakely, T., "Operating Room Resource Utilization: Chicago Area Survey Findings and Recommendations." Chicago Health Council, December 1974.

Using the CASH standards, we computed the weighted average preparation and cleanup time for the 2,182 operations performed during the 20-day test period at the 10 VA centers reviewed, as shown below.

Type of operation	Number of procedures	CASH time standards: Gross time	Allowance for PFD (note a)	Net time	Total hours
		(minutes)			
Minor	1,090	27	5.4	21.6	392.4
Major	800	41	8.2	32.8	437.3
Extended major	292	67	13.4	53.6	260.9
Total	2,182				1,090.6
	Average:	30 minutes			

a/Because CASH standards are used to make staffing projections, a 20-percent allowance is added for personal time, fatigue, and unavoidable delays (PFD). Since our model is concerned with actual cleanup and preparation times, for comparison purposes the CASH standards are shown with the PFD allowance excluded.

Opinions of VA operating room supervisors

We asked the operating room supervisors at the 10 centers reviewed to estimate the average elapsed time between the time a patient leaves the operating room and the time the room is ready for the next patient. Eight of the 10 stated that room preparation and cleanup time averaged 30 minutes or less. At the Prescott and Wadsworth centers, the supervisors told us that preparation and cleanup took 45 minutes.

Use of the 8-hour workday

As a fixed resource, operating rooms in VA centers and other hospitals are generally available for use 24 hours a day. In VA centers, however, surgery is scheduled during the regular 8-hour day shift of the operating room nursing staff, excluding weekends and holidays. Therefore, we used an 8-hour workday as the baseline for measuring operating room requirements for a given surgical workload.

Operating room utilization

There is no universally accepted utilization standard for operating rooms. However, we believe that an 80-percent utilization level is a reasonable goal for VA operating rooms. The Department of Defense uses an 80-percent utilization factor in developing its operating room requirements. While utilization levels in community hospitals have not generally reached 80 percent, numerous studies suggest that anything consistently below an 80-percent rate is an inefficient use of operating room resources. In their 1974 study, Rinde and Blakely 1/ emphasized that operating room management must aggressively control the surgical workload that can be controlled--specifically elective surgery--to achieve higher utilization. They pointed out that the low utilization levels are caused by two factors: poor facility planning (i.e, too many operating rooms) and poor surgery scheduling.

In the November 1979 "Bulletin of the American College of Surgeons," Dr. L. Donald Bridenbaugh stated that operating room utilization levels below 50 percent are inefficient and that, ultimately, someone must pay for that inefficiency. Each of the authors noted above cited an 80-percent level as the upper range of attainable utilization, except in unusual circumstances. They also noted that operation utilization rates consistently below the potential 80-percent level are symptomatic of poor facility planning. As noted on page 4, the 74 VA operating rooms we reviewed were--on the average--in use less than 50 percent of the time available during the 20-day test period.

According to utilization studies and VA center officials, idle operating room time must be provided to allow operating room managers enough flexibility to manage their surgery schedules. For example, idle operating room time occurs as a result of short-notice cancellations that leave gaps in the surgery schedule, operations that are finished before the end of the shift but too late to start another operation, and operating rooms that are occasionally closed for repairs and maintenance. Allowances must be made for emergencies and high-priority operations. Although idle operating room time is inevitable, we believe that VA's planning criterion should include a room utilization standard of 80 percent that, in our opinion, balances the need for scheduling flexibility with the need for efficient management and use of costly resources. The table on page 15 shows the sensitivity of our model when different levels of utilization are used to determine operating room requirements.

1/See footnote on page 11.

IMPACT OF WORKLOAD MODEL ON 10 CENTERS REVIEWED

Although the methodology VA used to plan the operating rooms at the 10 centers reviewed is unknown, applying VA's current planning criterion to these facilities would not measurably improve the average operating room utilization or significantly reduce the number of operating rooms available. However, applying our model to the 20-day test period, we found that the centers' surgical workload could have been handled with 22 fewer operating rooms than VA's current criterion would call for. Applying our model at an 80-percent utilization level would still leave, on the average, about 28 percent of idle time for schedule flexibility. Using VA construction and equipment cost estimates, we computed that applying our model could save about $3.5 million in potential replacement construction and equipment costs at the 10 centers reviewed. If our model were used to determine the number of operating rooms required at the Minneapolis center, which VA now plans to replace, a reduction of five operating rooms from VA's original estimate of 12 rooms could be made with estimated construction and equipment cost savings of $800,000.

Applying current VA criterion to centers reviewed makes little difference in number of rooms needed

Most of the centers we reviewed were built long ago, and VA Central Office officials do not know what criterion was used to determine the number of operating rooms included. None of the facilities were planned using VA's current criterion of 1 operating room for every 28 surgical beds. To determine the effect of VA's criterion on the number of operating rooms in use at the time of our fieldwork, we divided the number of surgical beds at the 10 centers by 28. As shown in the table below, an overall reduction of four operating rooms would result. Individually, six centers would need fewer rooms, three would need more, and one would need the same number. Using our workload model, at an 80-percent utilization level, eight of the centers would need fewer rooms and two would need the same number.

Operating Rooms in Use Versus Needed

VA medical center	Currently in use	Number of operating rooms needed (note a)				
		Based on 1976 VA criterion (note b)	Based on GAO's workload model at various utilization levels			
			80%	70%	60%	50%
Albany	10	7	4	5	5	6
Albuquerque	8	5	4	4	5	6
Batavia	4	c/2	c/2	2	2	2
Cheyenne	2	c/2	c/2	2	2	2
Denver	8	7	6	7	8	9
Long Beach	8	10	8	9	10	12
Minneapolis	9	12	7	8	10	12
New York	12	14	6	7	8	9
Prescott	3	c/2	c/2	2	2	2
Wadsworth	10	9	7	8	9	11
Total	74	70	48	54	61	71

a/In accordance with VA's approved space criteria, computations with fractions of 0.30 or less are rounded to the next lowest figure, and fractions of 0.31 or more are rounded to the next highest whole number.

b/One operating room for every 28 surgical beds.

c/Computations of 1 room or major fraction thereof were rounded to 2 to comply with VA's minimum room requirements for a surgical suite. (See p. 8 for description of GAO workload model.)

Fewer rooms, higher utilization using workload model

The above table shows the number of operating rooms needed based on our workload model, using data for the 20-day test period at various utilization levels. The table shows that using our workload model, at an 80-percent utilization level, results in 22 fewer operating rooms than VA's current planning criterion would call for. Using VA estimated construction and equipment costs of $160,000 per room, this amounts to potential savings of about $3.5 million if these facilities were replaced. In the case of the Minneapolis center, which VA originally planned to replace with 12 operating rooms, applying our model would require only 7 operating rooms. As shown in the following table, surgical suites planned at an 80-percent utilization level using our workload model would have--due to rounding fractions of rooms--actually been used about 72 percent of the time during our sample period. This compares to 49 percent for operating rooms planned under VA's

1976 criterion. Thus, applying our model would still leave about 28 percent of total operating room time available for scheduling flexibility. The Minneapolis center, which had the highest potential utilization level, would have about 18 percent idle time.

VA medical center	Average hours all rooms in use each day (note a)	Projected average daily operating room utilization percentages: VA 1976 criterion — Room hours available	VA 1976 criterion — Utilization percentage (note b)	Workload approach (note b) — Room hours available	Workload approach (note b) — Utilization percentage (note b)
	(rounded)		(rounded)		
Albany	24.9	56	44.4	32	77.7
Albuquerque	21.5	40	53.7	32	67.1
Batavia	8.0	16	50.0	16	50.0
Cheyenne	2.6	16	16.1	16	16.1
Denver	35.6	56	63.6	48	74.1
Long Beach	47.6	80	59.6	64	74.4
Minneapolis	45.8	96	47.7	56	81.7
New York	36.3	112	32.4	48	75.6
Prescott	8.4	16	52.3	16	52.3
Wadsworth	43.9	72	61.0	56	78.4
	c/274.5	560	49.0	384	71.5

a/Based on period April 16 to May 11, 1979 (weekdays only).

b/Based on expected average utilization rate of 80 percent.

c/Figures do not add to total due to rounding.

SOME VA OFFICIALS BELIEVE SURGICAL PLANNING SHOULD BE BASED ON PEAK LOAD REQUIREMENTS

Some VA officials at the centers we reviewed believe surgical facilities should be based on peak load requirements. For example, the chief of the surgery service at VA's Minneapolis center told us that surgical facilities planning should be directed at meeting peak load demands in order to give surgeons and operating room managers the flexibility needed to manage the surgical schedule. According to him, no surgeon will agree with our workload model because average utilization is the wrong basis for planning operating room requirements. He stated that planning must be based on a peak load situation--otherwise, emergencies will come in and there will be no place to put them because all the rooms are full.

However, another point of view was presented in an article in the November 1979 "Bulletin of the American College of Surgeons." The author--a surgeon and professor of surgery--stressed the need to balance the needs of the surgeons with "realistic restraints set by budget and utilization." The author included a methodology for determining the number of operating rooms that computes even fewer rooms than our workload model because it assumed a full 8-hour-per-day utilization for each room. Our model builds in a factor for idle time. As discussed earlier, we believe that some idle time is unavoidable and should be allowed for in planning operating room needs.

As to accommodating surgical emergencies, six of the centers in our review did not identify the number of emergency operations handled during the day shift. Therefore, we were unable to determine the frequency of such occurrences or their impact on the surgical schedule. However, at four centers--Albany, Denver, New York, and Wadsworth--that identified emergencies, emergency operations accounted for an average of 5 percent of the centers' 8-hour day workload. As noted on the preceding page, applying our model to the 10 centers reviewed showed that about 28 percent of total operating room time would be available for scheduling flexibility, including emergencies.

CONCLUSIONS

Using our surgical workload model, the 10 surgical suites at the VA medical centers we reviewed have 22 more operating rooms than needed. Our analysis of actual surgical workload data for the 20-day test period showed that, on the average, the 74 operating rooms at the 10 centers were not in use about 50 percent of the time available for scheduled surgery. While the criterion VA used to justify construction of the 74 rooms is unknown, continued use of VA's current planning criterion--1 operating room for every 28 surgical beds--will result in further overconstruction of operating rooms and low utilization of these costly resources. We believe that, if VA's planning criterion instead focused on surgical workload and the variations in surgical mix and surgeon experience of each center, savings in new or replacement construction and equipment costs could be realized. Immediate savings could be made at VA's Minneapolis center now planned for replacement if our model were used to plan the number of operating rooms.

We believe that our model can be a useful tool in determining the appropriate number of operating rooms in future VA surgical suites that will effectively meet the needs of the patient, the center, and the surgical staff.

RECOMMENDATIONS TO THE ADMINISTRATOR OF VETERANS AFFAIRS

We recommend that the Administrator direct the Chief Medical Director to:

--Discontinue use of VA's current operating room planning criterion in favor of a planning methodology based on surgical workload for new or replacement operating rooms similar to the one we developed, with the aim of achieving an 80-percent operating room utilization level.

--Use operating room estimates obtained from our model, or a similar workload model, to reassess the number of operating rooms needed at the Minneapolis VA Medical Center and use such a model for all future construction proposals submitted to the Congress. If, in VA's judgment, more operating rooms are needed than called for by the workload model, the Chief Medical Director should be required to justify the additional rooms.

RECOMMENDATION TO THE CONGRESS

Construction of new or replacement surgical suites in VA medical centers is not cost effective if operating room requirements are based on VA's current criterion. The Congress should not approve any funding requests for new or replacement surgical suites in VA centers based solely on room-to-bed ratios, unless the planning is so far along that adjusting the surgical suite(s) planned would not be economically feasible.

AGENCY COMMENTS AND OUR EVALUATION

In commenting on our recommendations (see app. I), VA generally agreed that developing and implementing an operating room planning methodology based on surgical workload would enhance its ability to plan. However, VA had some concerns with the planning model we developed and said that, until an agreeable workload model was developed, it would continue using its current operating room planning criterion. VA's comments and our evaluation are summarized below.

Operating room utilization

VA said that, while an 80-percent utilization may be achievable in some of its facilities, it is not a proper standard for evaluating each operating room in a surgical suite. According to VA, operating room utilization of less than 80 percent does not necessarily result from poor planning or inefficient management. VA said that some factors are beyond management control, such as location of other surgical facilities in the area, availability of surgeons, and the existence of specialized and dedicated rooms.

We believe that an 80-percent utilization rate represents a reasonable standard for evaluating operating room efficiency. Our review of current literature showed that many authorities considered this an optimal utilization rate and that using operating rooms at levels consistently less than 80 percent was inefficient and symptomatic of facility planning problems.

We recognize that certain surgical workload factors are beyond the control of operating room management. However, these factors generally result from emergency patient surgery, in-hospital transfers, short-notice cancellations, and postponements. We believe that the 20-percent variance between the maximum attainable operating room utilization (100 percent) and the optimal utilization rate (80 percent) we recommended more than adequately allows for these uncontrollable factors. 1/ Moreover, we believe that these uncontrollable factors point out the need for management to aggressively control the surgical workload that is controllable--elective surgery--which accounted for more than 90 percent of the workload at the 10 centers we reviewed. In our opinion, continued use of VA's current operating room planning criterion--1 operating room for every 28 surgical beds--is not cost effective and will continue to result in only rough estimates of operating room requirements and low utilization of these costly resources.

Impact of historical data on planning process

VA said that using historical data to determine average operating times will hinder the planning process because of the necessity to conduct separate studies for each surgical construction project. VA believed that using historical workloads will create unexplainable differences between similar facilities, will penalize surgical services which are operating effectively, and may lock a facility into an operating room configuration limited by past experience rather than recognizing future need or mission. According to VA, an operating planning model must be stratified to allow for program characteristics that affect operating room scheduling, such as case mix and complexity; levels of care; and facility size, location, and affiliation status. VA said that small hospitals require at least two operating rooms. 2/

1/As discussed on page 12, operating rooms in VA centers and other hospitals are generally available for use 24 hours a day. However, our model uses an 8-hour workday as the baseline for measuring operating room requirements. Thus, the 80-percent utilization factor applies to only one-third of the available time operating rooms can be used.

2/As indicated on page 15, we factored in VA's minimum requirement for two operating rooms per surgical suite into our model.

Based on our experience in using the model in connection with the 10 centers reviewed, we believe that using it for individual proposed projects is compatible with other planning activities for the individual facilities and will not slow down the overall planning process. Rather, using our model should give much more credibility to the process of planning one of the more expensive areas of a medical center.

We believe that historical data represent the best measure of operating room utilization and efficiency and that an assessment of a facility's past performance must be included in the decisionmaking process before future changes in operating room configuration and mission are made. Our planning model adequately considers those factors that directly affect operating room scheduling, particularly surgical mix, surgeon experience, levels of care, and affiliation status. In our opinion, VA's current room-to-bed criterion does not give sufficient consideration to these factors and results in an inappropriate number of operating rooms. In contrast, our model is designed to recognize the unique characteristics of each surgical suite and to arrive at an operating room estimate which will meet the needs of the surgical staff and achieve higher utilization of operating room resources. Particularly important is the fact that our model, unlike VA's criterion, recognizes that the surgical workload and other variables which affect operating room utilization vary significantly among VA centers, particularly between affiliated and nonaffiliated centers. In addition, our model can use stratified surgical workload data so that VA planners can evaluate a facility's need or capacity to adjust its operating room configuration to accommodate a change in mission.

Average operating time and intervals between operations

VA said that our computation of average operating times should include an allowance for the time a surgical patient enters and leaves the operating room rather than when anesthesia starts and ends. VA also suggested that the 30-minute interval between operations for room preparation and cleanup we used in developing our model be modified to allow for program differences among centers. However, VA said that the statistical data needed to establish a modified standard for room preparation and cleanup time intervals were not readily available.

We believe that our computation of average operating times provides a reliable and conservative estimate of the time it takes to perform an operation and to ready an operating room for the next patient. We found that the times surgical patients enter and leave the operating room are largely manageable by scheduling and that using these times--rather than the times we used in developing our model--overstates the average operating

times and understates the efficiency of the surgical team. Moreover, the excess times patients spend waiting in the operating rooms should be adequately compensated for in the planning model by using the 80-percent utilization factor.

We recognize that average time for room preparation and cleanup varies for each surgery procedure. However, based on our literature research and discussions with VA medical center officials, we believe that an average 30-minute interval for these activities is reasonable.

Application of our model to surgical construction projects

VA disagreed with our recommendation to use operating room estimates obtained from our model, or a similar workload model, to reassess the number of operating rooms needed at the Minneapolis VA Medical Center and use such a model for all future surgical suite construction projects.

We believe that the shortcomings we identified with VA's current planning criterion are significant and support discontinuance of its use for planning purposes. This was clearly evident when we applied VA's criterion to the 10 medical centers we reviewed and found that it would not measurably improve the average operating room utilization or significantly reduce the number of operating rooms, which were, on the average, in use less than 50 percent of the 20-day test period we reviewed.

CHAPTER 3

VA SURGICAL SUITES ARE OVERSTAFFED WITH OPERATING ROOM NURSES

Closely related to the shortcomings in VA's operating room planning criterion discussed in chapter 2, we found that 9 of the 10 centers in our review were overstaffed with operating room nurses. Overall, we estimated that these centers had about 32 (30 percent) more nurses than needed to handle the surgical workload. Overstaffing of operating room nurses resulted because most of the centers we reviewed had too many operating rooms--most of which were idle about 50 percent of the time available for scheduled surgery. On the average, operating room nurses at the centers reviewed spent about 50 percent of their time performing duties not directly related to the surgical suite.

We believe that, if VA assigned nursing staff to the number of operating rooms needed to handle the surgical workload (as discussed in ch. 2), staff productivity could be increased and distribution of nursing positions at medical centers could be improved. In addition, cost savings could be realized if VA made greater use of less skilled personnel for nonsurgical duties now being performed by skilled operating room nurses.

NURSING STAFF IN VA OPERATING ROOMS

For most surgical procedures performed at the 10 centers reviewed, the surgical team included two nurses--a scrub nurse and a circulating nurse. The scrub nurse is either a registered nurse, a licensed practical nurse, or a nursing assistant. The scrub nurse is responsible for assisting the surgeons by (1) handing them the instruments and supplies as needed, (2) keeping the surgical field neat, clean, and dry, (3) keeping track of the sponges, instruments, and needles used, and (4) preparing the dressings. Under VA's staffing requirements, the circulating nurse must be a registered nurse. The circulating nurse supervises the scrub nurse and attends to the general needs of the surgical team. Coverage of one circulating nurse and one scrub nurse is generally appropriate for most surgical procedures performed in VA centers. However, a few complex, high risk, and lengthy procedures--such as open-heart and thoracic surgery--require more than two nurses. On many minor procedures--such as tonsillectomies--either a circulating nurse or a scrub nurse is generally adequate.

Although the normal surgical team includes two operating room nurses, we believe that VA should use a staffing standard of 2.5 nurses for each operating room to allow for nonproductive staff time, such as personal needs, fatigue, and unavoidable

delays. The Chicago Hospital Council study by Rinde and Blakely 1/ recommended that 15 to 20 percent be allowed for the nonproductive time of operating room nurses. As shown below, this is consistent with the overall nursing staff patterns we found during the 20-day test period (April 16 to May 11, 1979) at the 10 centers reviewed.

VA medical center	Nurses available for duty (note a)			Nurses actually on duty		
	Staff (note b)	Rooms	Ratio	Staff (note c)	Rooms (note d)	Ratio
Albany	20	10	2.00	14.9	6.65	2.24
Albuquerque	16	8	2.00	10.6	5.00	2.12
Batavia	5	4	1.25	4.1	4.00	1.03
Cheyenne	4	2	2.00	3.8	1.25	3.04
Denver	16	8	2.00	13.1	5.70	2.30
Long Beach	30	8	3.75	25.0	7.10	3.52
Minneapolis	33	9	3.67	25.0	7.35	3.40
New York	24	12	2.00	17.6	8.05	2.19
Prescott	7	3	2.33	6.4	3.00	2.13
Wadsworth	28	10	2.84	18.5	7.75	2.39
	183	74	2.47	139.0	55.85	2.49

a/Includes registered nurses and nursing assistants.

b/Nurses assigned to main operating room suite, day shift, excluding operating room supervisors but including head nurses.

c/Average full-time-equivalent staff on duty each day.

d/Average rooms used each day.

Although the above table shows moderate variations in staffing patterns, the overall pattern that emerges is about 2.5 nurses for each operating room. Several VA operating room supervisors told us that they used the staffing standard of 2.5 nurses per operating room to estimate staff needs. In addition, Community Systems Foundation, a consulting firm in operating room management, uses a standard of 2.5 nurses per operating room. The same standard is also used by Medical Management Planning, Inc., a consulting firm VA uses for training programs.

MOST SURGICAL SUITES WERE OVERSTAFFED

Based on our analysis of surgical workload data, 9 of the 10 centers reviewed had more operating room nurses than could be

1/See footnote on page 11.

justified by the surgical workload. As shown below, these centers had about 32 (30 percent) more operating room nurses than needed if VA applied a staffing standard of 2.5 nurses for each operating room required to handle the surgical workload.

Operating Room Nursing Staff Needed Versus on Duty

VA medical center	GAO estimate of rooms needed	Average full-time-equivalent staff on duty needed at 2.5 per room	Average full-time-equivalent actual staff on duty	Staff over or under(-)	Percent over or under(-) (rounded)
Albany	3.88	9.7	14.9	5.2	54
Albuquerque	3.35	8.4	10.6	2.2	26
Batavia	1.25	3.1	4.1	1.0	32
Cheyenne	.40	1.0	3.8	2.8	203
Denver	5.56	13.9	13.1	-.8	-6
Long Beach	7.44	18.6	25.0	6.4	34
Minneapolis	7.15	17.9	25.0	7.1	40
New York	5.67	14.2	17.6	3.4	24
Prescott	1.30	3.3	6.4	3.1	94
Wadsworth	6.86	17.2	18.5	1.3	8
	42.86	107.3	139.0	31.7	30

As noted on page 15, our workload model rounds fractions of estimated operating rooms to whole rooms because, as a practical matter, partial operating rooms cannot be built. However, nursing staff requirements can be based on partial operating room estimates because operating rooms are not in use all of the time and the staffing levels needed to support the operating rooms during the scheduled surgery period are adjustable. For example, an operating room may be available for scheduling surgery in the morning but not in the afternoon. In this situation, part-time personnel often can be effectively used during the scheduled surgery period.

PRODUCTIVITY OF OPERATING ROOM NURSING STAFF WAS LOW

Operating room nurses should spend between 60 and 70 percent of their time performing duties directly related to the surgical workload. In the 10 centers reviewed, only the Denver center's nursing staff achieved a direct time percentage in this range. Overall, the operating room nurses at the centers reviewed spent over half of their workday performing duties not directly related to surgery.

Standard for direct time

As discussed earlier, we believe that 80-percent operating room utilization is a reasonable standard for determining the number of rooms required in a surgical suite. Assuming each nurse is productive 80 percent of his or her on-duty hours, the direct time for operating room nurses should average about 64 percent. This can be illustrated by a hypothetical surgical suite of five rooms, staffed with 2.5 nurses per room and an average of 2 nurses per procedure:

Available staff hours

(1) 5 rooms x 2.5 nurses x 8 hours = 100 hours/day

Direct staff hours

(2) 5 rooms x 8 hours = 40 room-hours for each day available
(3) 40 hours x .80 = 32 room-hours per day used
(4) 32 hours x 2 nurses = 64 direct staff hours

Direct-time percentage

$$(5)\ \frac{\text{64 direct staff hours}}{\text{100 available staff hours}} \times 100 = 64 \text{ percent}$$

Community Systems Foundation, in a study of operating room utilization, concluded that direct time should be between 60 and 70 percent for operating room personnel. Based on our own analysis, we agree that this range represents a reasonable standard for direct-time percentage.

Direct-time percentages were low at most centers reviewed

Nine of the 10 centers we reviewed fell below the 60- to 70-percent direct-time range, as shown on the following page.

VA medical center	Percent of direct time spent by nursing staff performing surgical duties (note a)
Albany	41.8
Albuquerque	50.5
Batavia	48.6
Cheyenne	16.8
Denver	68.1
Long Beach	47.7
Minneapolis	45.7
New York	51.4
Prescott	32.8
Wadsworth	59.2
Overall average	49.3

a/Covers 20-day period from April 16 to May 11, 1979 (weekdays only).

If the centers in our review assigned nursing staff to only the number of rooms needed to handle the surgical workload, the overall direct-time percentage would have been increased from 49 to 64--a gain of more than 30 percent.

OPERATING ROOM NURSING STAFF PERFORMED MANY NONSURGICAL TASKS

At the centers reviewed, operating room nurses performed many tasks that did not require the professional skills of registered nurses or nursing assistants trained as scrub nurses. Although such tasks are more suited to aides or orderlies, they were often done by skilled nurses when operating rooms were idle.

Some tasks do not require skilled surgical personnel

According to the Rinde and Blakely study discussed on page 11, some operating room tasks do not require skilled nursing personnel. Such tasks include patient transportation; housekeeping; and cleaning, packing, and sterilizing instruments. In the interest of economy, we believe these tasks should be assigned to nursing aides and orderlies. However, the operating room supervisors at the centers we visited said that such duties are done during periods when the surgical nurses are not in surgery and often done by whoever is available, regardless of skill level.

Assignment of nonsurgical tasks varied

Many different approaches were used to accomplish nonsurgical or indirect tasks at the 10 centers we reviewed. For example, nine centers used operating room nurses to transport patients from

the wards to the surgical suite. Of these, six centers--Albany, Albuquerque, Batavia, Long Beach, Minneapolis, and Wadsworth--usually used nursing assistants for this task. The Denver and Prescott centers assigned this task to both registered nurses and nursing assistants. At the Cheyenne center registered nurses normally transported the patients. The New York center used ward personnel. Similar variations existed in how other indirect tasks were handled at the 10 centers.

We believe the preceding data raise questions about VA's staffing practices and employee productivity. It appears that the highest and best use of registered nurses, or skilled scrub nurses, is not served when they perform nonprofessional tasks.

CONCLUSIONS

Most of the centers we reviewed had more operating room nurses than could be justified to handle the surgical workload. This overstaffing resulted largely because VA staffed operating rooms that were often idle. We believe that staffing idle operating rooms is not cost effective and reduces the productivity of nursing personnel. If VA staffed only the number of operating rooms justified by the surgical workload, staff productivity could be increased and distribution of nursing positions at VA centers could be improved. In addition, cost savings could be realized if VA made greater use of less skilled personnel to do many of the routine nonprofessional tasks now handled by skilled operating room nurses.

RECOMMENDATIONS TO THE ADMINISTRATOR OF VETERANS AFFAIRS

We recommend that the Administrator direct the Chief Medical Director to:

--Develop staffing guidelines for operating room nurses based on the number of operating rooms needed to handle the surgical workload.

--Better use skilled operating room nurses by assigning nonprofessional tasks to less skilled personnel.

AGENCY COMMENTS

VA generally concurred with our recommendations and said it would take the following corrective actions:

--Develop new staffing guidelines for operating room nursing staff, based on the number of operating rooms needed to handle the surgical workload.

--Analyze the duties of operating room nurses to determine which can be delegated to less skilled personnel. (See app. I.)

APPENDIX I

Office of the
Administrator
of Veterans Affairs

Washington, D.C. 20420

Veterans
Administration

FEBRUARY 18 1981

Mr. Gregory J. Ahart
Director
Human Resources Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Ahart:

We have reviewed your December 16, 1980 draft report, "High Cost and Low Utilization: Better Operating Room Planning Needed for Veterans Administration Surgical Suites," which discusses the Veterans Administration's (VA) criterion for surgical facilities in new or replacement hospitals. Our comments on the report recommendations follow.

The General Accounting Office (GAO) recommends that I direct the Chief Medical Director to:

--Discontinue use of the Veterans Administration's current operating room planning criterion and implement a planning methodology based on surgical workload for new or replacement operating rooms similar to the one GAO developed with the aim of achieving an 80 percent operating room utilization level.

We agree that developing and implementing an operating room planning methodology based directly on the number of surgical procedures will enhance our ability to plan. However, we believe the GAO model is not comprehensive and flexible enough to implement in each health care facility. While an 80 percent operating room utilization rate may be achievable in some of our facilities, in our opinion, it is not a desirable or realistic standard for evaluating each operating room in every facility. It must also be recognized that a utilization rate of less than 80 percent is not necessarily the result of poor planning or inefficient management, but may result from factors beyond management control. Some of these factors are the location of other surgical facilities in the area, availability of surgeons, and existence of specialized and dedicated rooms. Efficiency rates must be individualized to reflect inherent program characteristics.

We agree the concept of a planning model based on surgical workload is appropriate, but have the following concerns about the model GAO proposes:

1. The use of historical data to determine procedure times for each medical center is not appropriate because it will not reflect the

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future mission of the medical center. In addition, it will create unexplainable differences between similar facilities, penalize surgical services which are operating most effectively, necessitate separate studies for each surgical construction project, and slow down the development process. When using historical workloads, factors such as constrained program levels due to unavailability of qualified staff, resources, and space, must be considered. Projections based on past performance may lock the facility into an operating room configuration limited by past experience rather than one recognizing future need.

2. A planning model must be stratified to allow for inherent differences in programs. The program characteristics particularly affecting operating room scheduling are case mix and complexity, special purpose or dedicated rooms, levels of care provided (primary, secondary or tertiary), and health care facility size, location, and affiliation status. Small hospitals require a minimum of two operating rooms.

3. Individual standards for each hospital would introduce unneeded complexity in the planning process. Therefore, we suggest incorporating the three program levels -- primary care, secondary care and non-affiliated -- in the planning model.

4. When calculating the hours per operation, we believe the start and stop times should be when the patient enters and leaves the operating room rather than when the anesthesia is begun and ended.

5. The 30-minute time interval recommended for room preparation and cleanup between operations must be modified to account for the program characteristics given in subparagraph 2 above. However, the statistical data needed to establish standards for interval time are not readily available.

--Use operating room estimates obtained from the GAO model, or a similar workload model, to reassess the number of operating rooms needed at the Minneapolis VA Medical Center and use such a model for all future construction proposals submitted to the Congress and containing new or replacement operating rooms. If, in VA's judgement, more operating rooms are needed than called for by the workload model, then the Chief Medical Director should be required to justify the additional rooms.

We do not concur in this recommendation. In his book, "Planning of Surgical Centers," (Lloyd-Luke, London, 1973) Ervin Pustep, an internationally recognized authority, considers 60 percent a reasonable efficiency rate

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for staff and facilities, assuming a five-day week and 250 operating days per year. He also suggests that surgeries should not be open more than six hours per day since procedures late in the day tend to cause anxiety and discomfort to the patients.

GAO, using their model, projected a need for seven operating rooms for the Minneapolis Medical Center. Originally, the VA criterion required 12 rooms, as GAO cited, but our current projection of 277 surgical beds reduces this to 10 operating rooms. GAO's calculations are based on an 80 percent utilization rate and 30 minutes between procedures. The Ervin Pustep book indicates that a utilization rate of 60 to 70 percent may be attainable. As stated earlier, we believe the 30-minute interval between procedures, which GAO recommends, should be modified. Substituting a utilization rate of 65 percent, with 45 minutes between procedures, the GAO model would provide 10 operating rooms at the Minneapolis Medical Center, the same number required by our criterion. In addition to these 10 rooms, 3 additional rooms have been justified, 1 for stereotaxic surgery and 2 in the outpatient surgical center.

Until a criterion based on surgical workload is developed, we plan to continue using our current criterion. In the interim, we will be pleased to work with your staff in an effort to arrive at an agreeable model for determining the appropriate number of operating rooms for VA medical centers.

--Develop staffing guidelines for operating room nurses, based on the number of operating rooms needed to handle the surgical workload.

We will develop new staffing guidelines for operating rooms because we agree that nursing staffing should be based on workload and that idle operating rooms should not be staffed. However, the GAO model does not provide a valid basis for the standard that each nurse should average between 60 and 70 percent direct time for operating room support. The GAO conclusion that VA medical centers are 30 percent overstaffed in nursing service support to operating rooms is based on statistics which do not fully consider program characteristics, the highly specialized staffing required by certain facilities, or the appropriate division of labor.

--Make better use of skilled operating room nurses by assigning non-professional tasks to less skilled personnel.

The GAO planning model on which this recommendation is based does not identify the "other than surgery-related" duties to be delegated, nor does it differentiate them from duties "directly related to the surgical workload." The shifting of duties from one group of staff to another assumes the availability of other staff to absorb and fulfill the functions. In

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principle, we agree with this recommendation and will analyze the duties of operating room nurses to determine which duties may be delegated.

Thank you for the opportunity to review this draft report.

Sincerely,

MAX CLELAND
Administrator

(401820)

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