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INFECTION CONTROL

Military Programs Are Comparable to VA and Nonfederal Programs but Can Be Enhanced

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The Honorable Daniel K. Inouye
United States Senate

The Honorable Claiborne Pell
United States Senate

The Honorable Jim Sasser
United States Senate

In response to your request, this report discusses infection control programs in military hospitals and compares them to similar efforts in Department of Veterans Affairs (VA) and nonfederal hospitals.

We found that military infection control programs are comparable to those in VA and the nonfederal sector in the extent to which they use the infection control program elements that we identified in conjunction with acknowledged infection control experts. In fact, military programs are using more of these elements than are required in service regulations. However, these programs need more support from hospital management and more technical assistance from the services.

Several recommendations are made to improve these programs, all of which the Department of Defense agrees with.

As arranged with your offices, we are sending copies of this report to the Secretary of Defense, appropriate congressional committees, and other interested parties.

The report was prepared under the direction of David P. Baine, Director, Federal Health Care Delivery Issues, who can be reached on (202) 275-6207 if you have any questions. Other major contributors are listed in appendix VIII.

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Executive Summary

Purpose

The Centers for Disease Control (CDC) estimates that about 5 percent of all patients who enter a hospital contract at least one infection during their stay. With over 800,000 inpatient admissions annually, some 40,000 patients could contract infections each year while being treated in military hospitals. The incidence of hospital-acquired infections can be reduced, however, if hospitals operate effective programs to control infections.

Therefore, in line with their continuing interest in the quality of care in military hospitals, Senators Inouye, Pell, and Sasser requested GAO to review infection control programs in those hospitals. In performing this review, GAO assessed the completeness and adequacy of military infection control programs and compared those programs with programs operated in similar-sized Department of Veterans Affairs (VA) and nonfederal hospitals.

Background

The Office of the Assistant Secretary of Defense for Health Affairs has delegated responsibility for developing and implementing infection control policies and procedures to the three services (the Army, Navy, and Air Force) that operate hospitals. The services require their hospitals to operate infection control programs to identify existing infections and help prevent future occurrences.

GAO needed criteria outlining the basic elements of an effective infection control program in order to assess the programs operating in military hospitals. The program guidance the Department of Defense (DOD) and the three services issued to hospitals was too broad to serve this purpose. Moreover, no other U.S. health care organization had up-to-date and specific guidance.

To undertake this review, therefore, GAO worked with representatives of nine organizations and one other individual with expertise in infection control to develop a list of 56 basic elements of an effective program. The nine organizations included CDC, the Joint Commission on Accreditation of Healthcare Organizations, the American Hospital Association, the Association for Practitioners in Infection Control, and the Society of Hospital Epidemiologists of America. (See app. I.)

These elements, referred to in this report as GAO's basic elements, are applicable to infection control programs in any hospital with over 50 acute-care beds. (See app. II.)

GAO used these elements to examine military hospital infection control programs. It collected information through visits to nine military hospitals and a questionnaire sent to all 79 military hospitals with more than 50 acute-care beds, all VA medical centers, and a sample of 567 nonfederal hospitals. GAO used the questionnaire responses to compare military infection control programs with those in VA and nonfederal hospitals.

Results in Brief

Service guidelines do not include most of GAO's elements. However, infection control practitioners in military hospitals are using most of the elements. In the military hospitals GAO visited, the elements were used largely because of the individual initiative of the infection control practitioners. Having only limited guidance and direction from the services, military practitioners sought current infection control information and implemented many activities that went beyond their guidance and included the basic elements. The extent of use by military hospitals was similar to that of VA and nonfederal hospitals.

Several of the basic infection control elements, however, should be used by more practitioners in both the public and private sectors. These elements are generally more labor intensive than those in widespread use.

In addition, to be most effective, military infection control programs need management attention. The programs generally (1) lacked resources to perform all of GAO's basic elements or, in some cases, service-required activities; (2) were a low priority with hospital management; and (3) were not adequately monitored by the services.

Principal Findings

Service Infection Control Guidance Needs to Be Updated

Service guidance on infection control programs requires the use of few of GAO's elements. Of the 56 elements GAO believes should be basic to infection control programs, Air Force instructions specify 31; Navy instructions, 13; and Army instructions, 10. At the nine hospitals GAO reviewed, the infection control practitioners took the initiative to take training, contact others, or read literature concerning infection control programs. As a result, they used activities in their programs that went beyond service instructions and included most of GAO's basic elements. (See p. 20.)

Fifteen of the elements GAO identified are not being used as frequently by the military hospitals as the other 41. These elements, not one of which is included in service instructions, include assuring that physician advisors have taken a course in hospital infection control programs, more frequently conducting activities that identify infections, routinely reporting surgical wound infection rates to practicing surgeons, and reporting ward-specific infection data to ward supervisors. (See pp. 21-27.)

Military Programs Comparable to VA and Nonfederal Programs

Military infection control programs are comparable to those of VA medical centers and nonfederal hospitals in the extent to which they are using the GAO elements. Military hospitals generally use 41 of the 56 basic elements, while VA medical centers use 44 and nonfederal hospitals, 42. With the exception of one area, the specific elements used are the same and the utilization rates are similar. The specific elements that are being used less by military hospitals are also being used less in VA medical centers and nonfederal hospitals and, again, the utilization rates are similar. (See pp. 20-21.)

Management Issues Must Be Resolved

Programs at six of the nine hospitals GAO visited lacked sufficient resources (a combination of practitioners, administrative support, and computer-related support) to accomplish necessary infection control activities. For example, at one hospital, the practitioner collected information about infections, but did not analyze the information because she did not have time and lacked a computer program that would facilitate analysis. These factors reduced the programs' effectiveness, and may have lessened hospitals' ability to prevent infections. (See pp. 31-34.)

The services' mid-level commands are responsible for monitoring military hospital infection control programs. Service mid-level commands review hospitals' infection control programs only when requested by the hospital. The services said they rely on inspector general reports to identify weaknesses in infection control programs. However, we found inspector general teams lack specific guidance and trained staff to thoroughly assess infection control programs, and their reports did not identify existing weaknesses. (See pp. 34-36.)

Recommendations

GAO recommends that the Secretary of Defense direct the service secretaries, in conjunction with the Assistant Secretary for Health Affairs, to

- update service guidance to include components similar to GAO's basic elements (see p. 28),
- require the surgeons general to determine the relative priority of the infection control programs in relation to other hospital activities and ensure that hospitals provide additional resources for infection control where appropriate, and
- ensure that headquarters or mid-level command staff who are familiar with infection control program activities schedule periodic visits to provide technical assistance to each hospital's infection control program (see pp. 36-37).

Agency Comments

In its March 28, 1990, letter, DOD concurred with our findings and recommendations and stated that by May 1990 it will direct the services to:

- Adopt infection control policies that reflect the intent of the GAO elements and are in compliance with the standards of the Joint Commission, those of other nationally recognized experts, or both, as appropriate. The policies should describe the level of support required for the program.
- Reemphasize the importance of infection control programs to quality patient outcomes.
- Review infection control programs and assets, relative to resources, and take corrective action, as appropriate.
- Provide for both technical assistance and regular evaluation of the full scope of hospital infection control programs.

DOD also stated that it will continue efforts to facilitate and improve program management practices through the implementation and refinement of automated systems.

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Abbreviations

AHA	American Hospital Association
CDC	Centers for Disease Control
DOD	Department of Defense
GAO	General Accounting Office
IV	Intravenous
SENIC	Study on the Efficacy of Nosocomial Infection Control
VA	Department of Veterans Affairs

Introduction

Hospital-acquired infections are a significant health concern in the United States. The Centers for Disease Control (CDC) estimates that about 5 percent of all inpatients contract at least one hospital-acquired infection during their hospital stay. In 1987, the Department of Defense (DOD), through the three armed services, admitted over 800,000 patients to its 168 hospitals. A 5-percent rate of infection would suggest that 40,000 of these patients could have acquired infections—some of which could have been life threatening. But the number of infections can be reduced through effective hospital infection control programs. Therefore, in line with their continuing interest in the quality of care in military hospitals, Senators Inouye, Pell, and Sasser requested us to review infection control programs in those hospitals. In performing this review, we assessed the completeness and adequacy of military infection control programs and compared those programs with programs operated in similar-sized Department of Veterans Affairs (VA) and nonfederal hospitals.

Importance of Infection Control Programs

Many factors contribute to the prevalence of hospital-acquired infections. Hospitalized patients tend to be more susceptible to infection than healthy individuals because they are often ill or injured when they enter the hospital. Others may become susceptible as a result of surgery, insertion of catheters or tubes, or through the use of other equipment related to hospital care, such as ventilators. Further, patients admitted with infections could expose other patients to those infections. Visitors and hospital staff also introduce disease-causing organisms. However, health care workers can reduce the spread of infections from one patient to another by following certain practices when caring for patients. These practices can be as simple as washing their hands before and after providing care to each patient or using the proper technique to insert a needle intravenously.

In order to minimize the incidence of infections, hospital infection control programs monitor and emphasize patient care practices through two interrelated activities—surveillance and control. Surveillance activities involve (1) identifying patients with hospital-acquired infections, (2) analyzing data about those patients and their infections to determine causes, and (3) reporting analyzed data to hospital management and other staff who can use it to identify weaknesses in their patient care practices. Control activities consist of the specific actions taken to prevent infections, such as developing and revising hospital policies; teaching and reinforcing proper patient care practices; and implementing certain practices, such as the isolation of infected patients.

In 1974, CDC began a major study of infection control programs in hospitals.[1] In that study, hospitals without infection control programs were compared with hospitals that had such programs. The results of this effort showed that when an effective program was instituted, hospital-acquired infections could be significantly reduced. The study, which was updated in 1983, covered the four major types of hospital-acquired infections: bloodstream, pneumonia, surgical wound, and urinary tract. Officials conducting the study estimated that such infections constitute more than 80 percent of all hospital-acquired infections. CDC officials informed us that, generally, the findings of this study are as pertinent today as they were in 1974 and 1983. Specifically, if a hospital implements an effective infection control program, it will decrease its hospital-acquired infection rate.

Military Infection Control Programs

The Office of the Assistant Secretary of Defense for Health Affairs has delegated responsibility for the development and implementation of policies and procedures related to infection control to the three services (the Army, Navy, and Air Force). Further, the Assistant Secretary's Office has directed that all military hospitals with more than 25 beds be accredited by the Joint Commission on Accreditation of Healthcare Organizations. The Joint Commission establishes accreditation standards for both federal and nonfederal hospitals and requires, among other things, that hospitals maintain infection control programs.[2] Approximately every 1 to 2 years, inspectors general assigned to service headquarters (Air Force) or to a mid-level command (Army and Navy)[3] review hospitals' compliance with Joint Commission standards, including those related to infection control.

The services operate 168 hospitals worldwide, which, in 1987, admitted 839,886 patients. These hospitals vary in size from fewer than 10 to over 900 patient beds. Each service has a surgeon general who exercises

[1]CDC's "Study of the Efficacy of Nosocomial Infection Control" (SENIC) evaluated the impact of surveillance and control activities on hospital-acquired infections in a sample of hospitals.

[2]For example, Joint Commission revised standards, which took effect on January 1, 1990, require hospitals to have effective programs for the surveillance, prevention, and control of infections and that all hospital departments have written policies and procedures for infection control.

[3]Organizational units between the service level and hospital level are referred to as mid-level commands. The Air Force has 12 mission-oriented commands that include the Tactical Air Command, the Military Airlift Command, and others; the Navy has six Health Service Support Offices that correspond to the fleet commands; and the Army has three geographic commands, including the Health Services Command, which is responsible for the continental United States. In addition, the Health Services Command contains eight Army medical centers that provide oversight and technical assistance for the smaller facilities within their regions.

technical supervision over its health care facilities. The surgeons general issue infection control policies and regulations through one or more staff offices under their authority, either quality assurance (Air Force) or both quality assurance and preventive medicine offices (Army and Navy). The Army revised its two regulations governing infection control programs in August 1986 and April 1987. These regulations are general in nature and generally limited to the program structure (program organization and responsibilities). In April 1988, the Air Force issued a draft infection control regulation[4] that includes general requirements similar to the Army requirements and also (1) details required patient care practices, (2) elaborates upon staff duties, and (3) provides detailed criteria describing under what circumstances an infection should be considered as hospital acquired. In January 1989, the Navy issued two infection control manuals (one for hospitals and one for clinics) that provide standardized guidance for Navy hospital infection control programs, such as suggested surveillance, analysis, and reporting activities. As of November 1989, the Navy was writing an infection control regulation to supplement its existing quality assurance regulation.

Both the Air Force and the Army have designated specific officers as infection control consultants who provide assistance to the hospitals when requested. In January 1989, the Navy designated the practitioners at the four largest Navy hospitals and the Chief of the Naval Environmental Health Department as Navy infection control consultants who will be available to provide advice and consultation to Navy practitioners throughout the service. As of October 1989, Navy quality assurance staff from mid-level commands were required to visit hospitals annually. In March 1990, DOD officials informed us this is no longer required and that the newly established Health Service Support Offices will have quality assurance officers available for consultation.

Information about any serious infection control problems found during inspector general reviews, mid-level command reviews, or Joint Commission accreditation surveys is provided to the surgeons general by the performing organization. The surgeons general do not require hospitals to submit any extensive infection control information. Service hospitals do, however, report overall infection rates in their annual quality assurance reports.

Within each service's hospitals (1) commanders are responsible for establishing and maintaining effective infection control programs,

[4]The final version of this regulation became effective August 1, 1989.

(2) infection control committee chairmen are assigned responsibility for directing the program's operations, and (3) infection control practitioners have primary responsibility for implementing the hospital's infection control program.

Costs of Hospital-Acquired Infections

Hospital-acquired infections can cause increased lengths of stay, needless illnesses, untimely death, and additional costs for treatment (e.g., unplanned surgery or intravenous antibiotics). According to research based on the SENIC study, each hospital-acquired infection adds an average of 4 days to a patient's hospital stay, with associated costs. These findings apply directly to military hospitals, which in many circumstances lack sufficient staff or other resources to serve additional patients. Specifically, if patients are required to extend their stays because of hospital-acquired infections, other potential patients may have to be referred to more expensive, nonfederal facilities, thus increasing DOD's medical costs.

Increased costs are not the only result of hospital-acquired infections; the patients may also suffer discomfort or, in extreme cases, permanent harm. The "costs" to the patient who has an infection vary. For example, urinary tract infections can be painful, but are generally not life threatening, whereas pneumonia and bloodstream infections could be fatal if not detected and treated in a timely manner.

Objectives, Scope, and Methodology

The objective of our review was to (1) evaluate the content of military infection control programs and the level of support such programs received from administration at all levels, and (2) determine how these programs compared with those in nonfederal hospitals. Because we also had data on VA's medical centers,[5] we incorporated information on their programs for comparative purposes. We conducted this evaluation during the period November 1987 to November 1989, in accordance with generally accepted government auditing standards.

Before starting this review, we met several times with CDC officials to discuss, from a conceptual perspective, what a good basic infection control program should consist of (i.e., a program that would consist only of fundamentals). Drawing from these discussions, we determined that there was no current, generally accepted written guidance available to

[5]Infection Control: VA Programs Are Comparable to Nonfederal Programs, but Can Be Enhanced (GAO/HRD-90-27, Jan. 31, 1990).

the health care community on what constitutes the basic elements of an effective surveillance program.[6] Given this lack of guidance, we sought out eight additional organizations that are recognized by the medical community as having expertise in infection control, and one infection control expert, to develop a comprehensive list of elements that might be included in a basic infection control program in today's medical environment. Appendix I describes how the basic elements were developed and lists the organizations and individual we contacted to assist us in this effort.

The list developed as a result of these interactions contains 56 basic elements, which we believe represent the fundamentals of an effective infection control program (see app. II). The basic elements place emphasis on surveillance activities; however, control activities are vital to an infection control program. We included in our list only broad categories of control activities performed by infection control staff because some control activities, unlike surveillance activities, are performed not only by the infection control staff but by other hospital personnel. Further, the control activities performed by the infection control staff depend heavily on the surveillance findings and circumstances within the hospital. The basic elements are limited to those appropriate for acute-care hospitals with more than 50 beds because infection control experts informed us that infection control needs and practices differ for hospitals providing long-term care and for hospitals with fewer than 50 beds. The elements were used to examine the content of military infection control programs and compare them with VA and nonfederal programs.

To help (1) evaluate the content of military infection control programs being conducted in calendar year 1987 and (2) compare the content of military programs with VA and nonfederal programs, we prepared a questionnaire in conjunction with CDC that was based on the basic elements we developed. In May 1988, we sent the questionnaire to all 79 military hospitals with more than 50 beds, 159 VA medical centers, and a random sample of 567 nonfederal hospitals stratified by size and affiliation. Usable responses were received from 77 military and 443 nonfederal hospitals and 158 VA medical centers. The data from the 443 nonfederal hospitals were used to make estimates about the universe of nonfederal hospitals with 50 or more acute care beds (estimated at 3,872). All of the data on nonfederal hospitals in this report are based

[6]Guidance on infection surveillance programs should be differentiated from guidance on patient care practices related to infection control. CDC guidelines detail recommendations on practices to be carried out by providers to prevent infections, but specific guidance on surveillance procedures was not available.

on our sample and are subject to sampling error. Appendix III describes the methodology we used to select the nonfederal hospitals and presents the sampling errors associated with the estimates for the nonfederal hospitals.

To encourage respondents to answer the questionnaire accurately, we promised them confidentiality. A random sample of 16 military hospitals was requested to submit certain documentation that would allow us to verify their responses to nine of the questions. Twelve of the 16 hospitals submitted documentation that verified their responses to those nine questions.[7]

We visited 9 hospitals—3 from each service—from the 79 military hospitals with more than 50 operating beds. The nine were judgmentally selected to provide a variety of hospital size and geographic location. The results from these nine hospitals cannot be projected to the military services as a whole. The nine military hospitals we visited are listed in appendix IV.

At each of the nine hospitals we examined their infection control programs by:

- interviewing the commanding officer, the infection control committee chair, the infection control practitioner, and other physicians, nurses, and administrative staff;
- reviewing minutes of the infection control committee and the quality assurance committee and other documentation;
- examining data on infections; and
- accompanying infection control practitioners on ward rounds.

To allow comparison of the questionnaire results between military hospitals, VA medical centers, and nonfederal hospitals, we divided the hospitals into three groups according to bed size (50-99 beds, 100-399 beds, and 400 or more beds). Our conclusions were the same regardless of whether or not we compared responses from military, VA, and nonfederal hospitals by size. Therefore, in this report, we included the results from all hospital responses without regard to size.

[7]The remaining four hospitals were contacted by telephone about supplying documentation, but they did not provide any.

Our comparison of infection control programs focused on the extent to which the military, VA, and nonfederal programs were utilizing the elements we identified. We did not attempt to calculate or compare infection rates for the hospitals in these sectors.

We met with officials and gathered documentation from DOD and services' headquarters and mid-level commands about the oversight, guidance, and technical assistance they provide the hospitals on infection control. Major offices visited included the Office of the Assistant Secretary of Defense for Health Affairs; the Army, Navy, and Air Force Offices of the Surgeons General; the Army Health Services Command; the Navy Medical Command; the Air Force Tactical Air Command and Air Training Command; and the Navy Southwest and National Capital Regional Offices. We also reviewed 1987 and 1988 Inspector General reports for Army and Air Force hospitals, and Navy reports for medical geographic commands and hospitals in our sample. Finally, we discussed the development and importance of our basic elements with Army and Air Force infection control experts.[8]

[8]At the time of our review, the Navy had not designated any individuals as infection control experts.

Increased Usage of Our Basic Elements Could Improve Infection Control Programs

The 56 elements we identified have applicability to military hospitals, VA medical centers, and nonfederal hospitals. Each of these groups is currently using a significant number of these elements, and the utilization rates for specific elements are similar. (See app. V for utilization rates by military and nonfederal hospitals.) Military infection control staff are generally using 41 of the 56 basic elements we developed, practitioners in VA are using 44, and practitioners in the nonfederal sector are using 42. The three services' regulations require or provide for between 10 and 31 of these elements.

The elements that were not generally used by practitioners in military hospitals, VA medical centers, or nonfederal hospitals included: reporting infections to ward supervisors and surgeons; performing, at required frequency, identification activities for surgical wound infections, urinary tract infections, and pneumonia; and developing baseline infection rates. Failure to use these elements hampers the effectiveness of an infection control program.

Basic Elements of an Infection Control Program

Prior to beginning this review, we found no detailed DOD guidance on infection control. Further, the guidance on infection control programs that existed in the health care community, in general, either was outdated, did not cover all the major components of a program, or was not specific as to what the basic elements of a program were. For example, the Joint Commission on Accreditation of Healthcare Organizations was in the process of rewriting its standards on infection control programs.[1] Researchers had published studies showing the effectiveness of individual program activities in reducing the number of infections, but no one had studied an overall program since CDC's Study of the Efficacy of Nosocomial Infection Control (SENIC). Also, an American Hospital Association infection control handbook listed 15 surveillance and control activities and stated that some or all of them may be performed by the infection control practitioner. The handbook did not differentiate between activities that should be performed for a basic program and activities that go beyond a basic program and are part of an optimal program.

As discussed in chapter 1, to fairly evaluate the content of military infection control programs, we worked with several organizations knowledgeable in infection control to identify a set of current basic elements that are flexible enough to apply to different acute-care hospital

[1]The revised standards on infection control took effect on January 1, 1990.

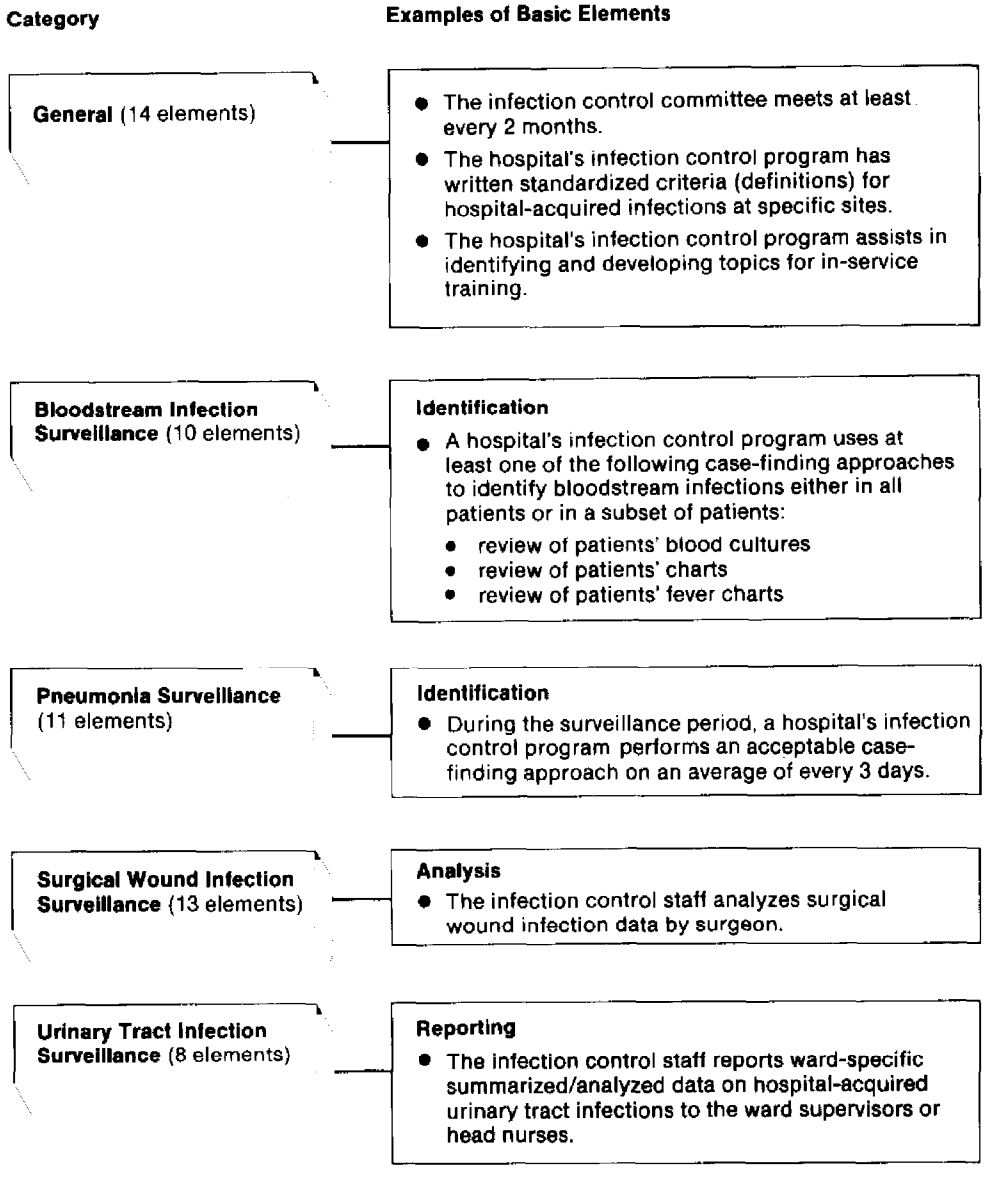
environments.[2] The result is a set of 56 elements in five categories: general elements, bloodstream infections, pneumonia, surgical wound infections, and urinary tract infections. Appendix II contains a complete listing of these elements. The general elements category includes 14 elements that would apply to all hospitals and addresses the structure of the program and surveillance and control activities. The remaining four categories represent surveillance activities specific to the major types of infections. The surveillance activities relate to:

- identification of infections, what sources to use and how often to identify infections;
- analysis of infections, what factors should be analyzed to determine the causes of an infection; and
- reporting of infections, which hospital officials should receive analyzed infection data.

Figure 2.1 cites specific examples of the elements that are included in each group.

[2]Hospital environments may differ in the types of clinical services offered, the types and amount of available resources, and the number and risk of infections.

Figure 2.1: Main Categories of Elements in Infection Control Programs



Our basic elements allow for two different surveillance approaches: total surveillance or targeted surveillance. Under total surveillance, an infection control practitioner searches for all four types of infection in every hospital patient, on either a periodic or continuous basis. Practitioners performing this type of surveillance would generally use 51 of

our 56 elements.[3] Under targeted surveillance, the areas of highest risk or concern are periodically identified, and the infection control practitioner focuses his or her attention on those areas. Under this type of surveillance, 14 general elements would always apply, and the remaining elements used would depend on the specific areas of concern being targeted: bloodstream, pneumonia, surgical wound, or urinary tract. Further, for a specific period of time, a hospital may also elect to search for one or more of the infection types in only high-risk patients, such as patients in the intensive care unit.

The type of surveillance a hospital used depends on the staff available and the special requirements or interests of the hospital. CDC officials stated that, in the 1970s, medical authorities believed that all hospitals should conduct total surveillance. Since that time, experts have acknowledged that infection control program resources are better spent focusing on patients with a high risk of infection, such as those in the intensive care unit, where the impact from reducing infections is greater. Thus, targeted surveillance can be considered an acceptable approach.

The number of elements applicable to a hospital's program depends upon the surveillance approach.

Military Practitioners Utilize Many Basic Elements on Their Own Initiative

Our analysis of questionnaire responses indicated that 41 of the 56 basic elements were being used by at least 70 percent of military hospitals when such use was appropriate.[4] The other elements were also used by hospitals in each group, but to a more limited extent. Given that the services' guidance on infection control programs neither require nor address all of our elements (the Air Force requires 31; the Navy, 13, and the Army, 10), this utilization rate is excellent and is largely attributable to the professionalism of the practitioners. For example, practitioners at the nine hospitals we visited took the initiative to take training, contact others, or read literature on infection control programs. As a result, some activities in their programs went beyond service guidance and included many of our basic elements. Similarly, 44 elements were used by at least 70 percent of applicable VA medical centers, and 42 elements

[3]The five remaining elements include activities that are applicable when targeting certain types of infections (e.g., analyzing bloodstream infection data by whether or not the patient had an intravenous (IV) catheter).

[4]Because not all hospitals have to meet all elements, when we calculated percentages, we included only those hospitals for which the element was applicable.

were used by at least 70 percent of nonfederal hospitals when appropriate.

The three services were similar in the extent to which they used our elements. Forty-two of the elements were used by at least 70 percent of Navy hospitals when applicable, and 41 elements were used by at least 70 percent of both Army and Air Force hospitals. Although the number of elements used by the services was similar, the use of a few individual elements varied by service. For example, 77 percent of Navy hospitals that conducted surveillance for surgical wound infections conducted such surveillance at least every 3 days,[5] whereas 65 percent of applicable Air Force hospitals and 39 percent of applicable Army hospitals did so. In another element, 50 percent of Navy hospitals authorized their nurses to initiate isolation procedures without a physician's approval, while over 80 percent of Air Force and Army hospitals gave nurses such authority.

Some Basic Elements Are Not as Widely Used as Others

Certain elements we identified were not widely used by practitioners in either military hospitals, VA medical centers, or nonfederal hospitals.[6] These elements relate to:

- the availability of a physician trained in infection control to serve as consultant for the infection control program,
- the specific frequency with which surveillance activities should take place,
- the development of baseline rates for specific types of infection, and
- the submission of analyzed infection data to personnel who can take preventive actions.

We did not ask respondents to our questionnaire why these particular elements were not as widely used as the others. But some of these elements represent time-consuming surveillance activities. In addition, not one of these elements was required by service regulations.

[5]Although our questionnaire states "on average about once every 1 to 3 days," in this report we simplified this element to "at least every 3 days."

[6]We define "widely used" as when 70 percent or more of the hospitals used the element.

Trained Physician Consultants Needed for Infection Control Programs

One of our elements calls for infection control programs to have, serving as consultant or supervisor, a physician who has taken at least one training course in hospital infection control. This element has a relatively low utilization rate in military and nonfederal hospitals and VA medical centers when compared with most other elements. Service regulations state only that the infection control committee chairman should be knowledgeable and interested in infection control. According to practitioners whom we contacted, all their hospitals have physicians available to the infection control staff as consultants or supervisors. But at most hospitals surveyed these individuals had not received any training in hospital infection control programs. Military, VA, and nonfederal hospitals with more than 400 beds were more likely to have a trained physician than were smaller hospitals in each group. According to Army and Air Force infection control consultants, some physicians had not received training in infection control because hospitals lacked training funds and staffing shortages prevented physicians from leaving hospitals for the period needed to receive such training.

Table 2.1 provides a comparative analysis of the utilization of this element by military, VA, and nonfederal hospitals. Utilization of this element by service is shown in appendix VI.

Table 2.1: Hospitals That Do Not Have Physician Consultant/Supervisor Trained in Infection Control

Hospital entity	Number of hospitals	Hospitals without physicians trained in infection control	
		Number	Percentage
DOD	77	52	68
VA	158	66	42
Nonfederal	3,872	2,051	53

CDC's SENIC study showed that a correlation exists between fewer infections and programs with a physician consultant trained in infection control. CDC officials still believe that trained physician consultants are important for an effective infection control program.

Need for Frequent Surveillance

Our basic elements call for an infection control practitioner to take steps at least every 3 days to (1) determine which hospital patients may have infections, and (2) identify infections before a patient's discharge. This activity—called case finding—can be done by reviewing laboratory cultures, reviewing patient charts, and/or asking nurses about patients with signs or symptoms of infection. These activities are time consuming and require the practitioner's continual attention, but performing them

at least every 3 days allows the infection control staff to identify problems and take corrective action before infections get out of control.

CDC officials believe that case finding should be done at least every 3 days because hospitals are emphasizing shorter lengths of stay for patients. Thus, if case finding is not done within this time frame, the program may not identify patients with infections before discharge.

Air Force regulations require hospitals to perform total surveillance and describe some case-finding activities that practitioners may use. They do not, however, address the frequency with which case-finding activities should occur. Neither Army nor Navy regulations address case-finding methods or frequency. Our questionnaire results indicated that over 30 percent of infection control practitioners are not performing case finding at least every 3 days for surgical wound, pneumonia, and urinary tract infections. The Army consultant believes surveillance may not be performed as frequently as every 3 days in some Army hospitals because infection control staff lack sufficient time to perform the work, particularly part-time practitioners whose other duties may override infection control responsibilities.

Table 2.2 compares the utilization by military, VA, and nonfederal hospitals of our case-finding frequency elements pertaining to surgical wound, pneumonia, and urinary tract infections. Utilization of these elements varied widely by service as shown in appendix VI.

Table 2.2: Hospitals Not Performing Case Finding at Least Every 3 Days

Hospital entity	Number of hospitals	Hospitals not performing element	
		Number	Percentage
Surgical wound surveillance			
DOD	76	31	41
VA	131	55	42
Nonfederal	3,732	1,671	45
Pneumonia surveillance			
DOD	68	22	32
VA	141	62	44
Nonfederal	3,546	1,419	40
Urinary tract surveillance			
DOD	75	33	44
VA	141	66	47
Nonfederal	3,586	1,631	45

In contrast to the aforementioned utilization rates, 16 (22 percent) of the 74 applicable military hospitals did not perform case finding for bloodstream surveillance at least every 3 days. Similarly, 17 percent of VA medical centers and 17 percent of nonfederal hospitals did not perform case finding for bloodstream surveillance at least every 3 days. One possible explanation for the higher use rate is that case finding procedures for bloodstream infections are less time consuming than those required for other infections. Case finding for bloodstream infections can be done through a review of laboratory results, whereas identifying the other three types of infection requires more time-consuming methods. These methods include reviewing laboratory results coupled with discussions with nurses about signs and symptoms of infection in patients or an examination of patients' medical records.

Need for Baseline Rates by Type of Infection

Baseline infection rates give a hospital an indication of its "normal" level of infection. These rates represent the frequency a specific type of infection occurs within a targeted population in a particular hospital based on past surveillance. For example, surveillance conducted on bloodstream infections at a given hospital over the last 2 years may show a 1-percent bloodstream infection rate. This percentage becomes the baseline from which future rates will be measured.

Service regulations do not require development of baseline rates for the four major types of infection. The Air Force regulation requires calculation of a hospitalwide baseline rate that would include all types of infections, but does not require baseline rates for specific types of infections. Army and Navy quality assurance regulations require that annual or semiannual rates be calculated for all hospital-acquired infections and for surgical wound infections, but not for the other three types of infections for which we developed elements. According to the Army consultant, some Army hospitals do not calculate baseline rates for individual types of infections because Army regulations require annual reporting of an overall hospital infection rate. Our basic elements call for hospitals to develop baseline rates by type of infection.

Questionnaire responses indicate that, despite the lack of service requirements, many military practitioners have established baseline rates for each type of infection. Table 2.3 compares the military utilization of baseline rates with VA and nonfederal hospitals for the four types of infections. Again, utilization of these elements by service is shown in appendix VI.

Table 2.3: Hospitals Conducting Surveillance That Do Not Have Baseline Rates

Hospital entity	Number of hospitals	Hospitals without baseline rates	
		Number	Percentage
Bloodstream surveillance			
DOD	74	34	46
VA	152	41	27
Nonfederal	3,648	1,327	36
Surgical wound surveillance			
DOD	76	26	34
VA	131	16	12
Nonfederal	3,732	970	26
Pneumonia surveillance			
DOD	68	31	46
VA	141	44	31
Nonfederal	3,546	1,150	32
Urinary tract surveillance			
DOD	75	33	44
VA	141	38	27
Nonfederal	3,586	1,026	29

Four of the nine hospitals we visited compared their current infection rates with CDC or other published historical rates,[7] instead of comparing current rates to hospital baseline rates. For example, one Navy hospital computed monthly totals for each of the four major infection types and compared them with a "nationally accepted monthly total." CDC officials told us this is not an acceptable method of tracking a hospital's own performance because hospitals vary by patient characteristics and the types of procedures they perform.

Infection Control Data Should Be Reported to Personnel Who Can Take Preventive Actions

Thirteen of our basic elements identify specific personnel to whom infection data analyses should be provided (e.g., urinary tract infection data should be analyzed by ward and given to the ward supervisor). Service regulations generally do not require infection control practitioners to accumulate and analyze data by specific groups or individuals, nor do they require that the data be reported to those groups or individuals. The closest any come to such a requirement is the Air Force regulation that requires infection control data to be reported to the infection control committee. Army and Navy regulations do not contain any requirements for reporting infection control data to hospital officials. Although

[7]CDC periodically publishes average rates, by type of infection, from data that an average of about 80 hospitals voluntarily submit monthly.

patient care providers are represented on infection control committees through their department heads, such representation does not guarantee that providers receive needed information.

Despite the lack of guidance on who should receive infection control data, nearly all military hospitals used 6 of these 13 elements. Specifically, over 80 percent of military hospitals reported appropriate infection data to the infection control committee and/or surgical wound infection data to chiefs of surgery and operating room supervisors.

The other seven elements were used, but to a lesser extent. Table 2.4 compares how military, VA, and nonfederal hospitals used the elements that involve reporting surgical wound infection data to practicing surgeons, and bloodstream, pneumonia, and urinary tract infection data to ward supervisors. Appendix VI shows the extent to which the three services used these elements. The remaining elements (reporting to surgical complications committees, intravenous therapy teams, and respiratory therapy teams) were applicable to only small numbers of hospitals, and, therefore, are not shown in the table.

Table 2.4: Hospitals Analyzing Infections, but Not Reporting Results to Appropriate Personnel

Hospital entity	Number of hospitals performing analysis	Hospitals not reporting results to appropriate personnel	
		Number	Percentage
Bloodstream infection data to ward supervisors			
DOD	62	24	39
VA	148	52	35
Nonfederal	2,988	962	32
Pneumonia infection data to ward supervisors			
DOD	58	21	36
VA	135	47	35
Nonfederal	2,928	789	27
Urinary tract infection data to ward supervisors			
DOD	60	25	42
VA	139	44	32
Nonfederal	3,051	708	23
Surgical wound infection data to practicing surgeons			
DOD	59	42	71
VA	93	72	77
Nonfederal	2,973	2,234	75

Table 2.4 shows that many hospitals indicated that they analyzed infection data either by ward or by practicing surgeon. But the hospitals are not routinely reporting the analyzed data to ward supervisors or the surgeons involved.

Infection control experts indicate that pertinent data on infections should be reported to appropriate hospital personnel who provide direct patient care. With such data, these individuals may have more incentive to change patient care practices to prevent infections. For example, studies by various infection control researchers indicate that reporting surgical wound infection rates to the surgeons who perform the operations has a major effect on reducing infections.

The effectiveness of such reporting was demonstrated during our visit to an Army hospital where the practitioner analyzed surgical wound infection data by surgeon and reported the results to the surgical department. This hospital's practitioner found that the infection rate in the obstetrics section was significantly higher than in the rest of the surgical department over a 4-month period. While other surgery sections averaged a 2-percent surgical wound infection rate during this 4-month period, the obstetrical section averaged 20 percent. The practitioner noted that several of the infected patients were treated by the same resident and provided this information to the chief of obstetrics who counseled the resident. The infection rate in the obstetrical section decreased to about 5 percent over the next 2 months. Army and Air Force consultants believe that some hospital infection control programs are not reporting surgeon-specific infection rates because infection control practitioners may be intimidated by surgeons who do not necessarily want to receive this information.

Military and VA Use of One Element Differs Significantly From Nonfederal Sector

One basic element was used significantly less in the nonfederal sector than it was in military and VA hospitals. This element requires that infection control practitioners and registered nurses have authority to implement isolation procedures in an emergency without a doctor's order; this authority should be in writing. Questionnaire results indicated that about 23 percent of military hospitals did not give practitioners and registered nurses this authority. Similarly, 22 percent of VA medical centers did not give nurses this authority. Conversely, about 37 percent of nonfederal hospitals did not give nurses this authority.

Army and Air Force Consultants Support Use of Our Elements

Representatives from the Office of the Assistant Secretary of Defense for Health Affairs and the three services agreed with most of the basic elements we developed. In addition, Army and Air Force infection control consultants supported the use of our basic elements and provided their opinions on the importance of the elements that were not widely used:

- The Army consultant stated that when some kind of surveillance is not conducted at least every 3 days, practitioners miss opportunities to take corrective measures before infections spread.
- An Air Force consultant stated that military hospitals should not compare their rates with CDC rates because their patient population is very different from populations served by nonfederal hospitals. The Army consultant also believes this element is important because, without service-specific baseline rates, hospital officials do not know if their current rates are outside the "normal" or anticipated threshold.
- In addition, an Air Force consultant is concerned that ward supervisors—who can greatly influence patient care practices—are not receiving infection control data about their patients.

Conclusions

The basic elements we developed are fundamental, generally accepted by infection control practitioners in both the public and private sectors, and supported by organizations knowledgeable about infection control. Cumulatively, they form the basis for an effective infection control program whether in federal or nonfederal hospitals. Infection control programs in the military, VA, and the nonfederal sector are using most of the elements we developed. This is happening because the practitioners are taking the initiative to determine what elements should be used in an effective infection control program. But the services' written guidance on the subject lags behind the practitioners' activities and, in many cases, is so general that it is of questionable value. We believe that the use of the elements that we identified, packaged as a basic infection control program in each service's regulations, would improve the effectiveness of the military's programs.

Recommendation

We recommend that the Secretary of Defense direct the service secretaries, in conjunction with the Assistant Secretary of Defense for Health Affairs, to update service infection control regulations. At a minimum, the regulations should require components similar to those in our basic elements.

Agency Comments

In its March 28, 1990, letter (see app. VII), DOD concurred with this recommendation and stated that by May 1990 the Assistant Secretary will direct the services to adopt infection control policies that reflect the intent of the GAO elements and are in compliance with current Joint Commission standards or those of other nationally recognized experts as appropriate, or both. The policies will describe the level of support required for maintenance of the program.

Infection Control Should Receive More Managerial Attention at All DOD Levels

Although our questionnaire showed that military infection control programs used most of our basic elements (see ch. 2), a questionnaire cannot capture how well these programs were integrated and supported throughout the DOD system. Lack of management support and attention can undercut the programs' effectiveness.

Infection control programs at several of the hospitals we visited did not have the resources to adequately perform their activities and were not well monitored by mid-level commands. Of the nine hospitals we visited, six had infection control programs that did not meet service requirements or perform essential infection control activities because of a lack of resources. Further, both the Army and the Air Force had discontinued their mid-level periodic reviews and, therefore, relied on their inspector general surveys to identify weaknesses in infection control programs. However, inspector general surveys conducted at military hospitals did not always identify deficiencies. As a result of these situations, infection control programs were not as effective as they could have been.

Hospital Management Does Not Emphasize Infection Control

Infection control is one of many hospital programs competing for relatively scarce resources. It is also a program that affects many hospital activities. At all nine hospitals we visited, hospital commanders had either not enforced participation in the program by all clinical services of the hospital or not given the program adequate resources to accomplish its objectives. This reduced each program's effectiveness. DOD concurred, stating that infection control programs can benefit from policy guidance and increased management attention. DOD also noted that its review of Joint Commission survey findings suggested that infection control programs can benefit from enhanced oversight and attention.

Hospital Management Gives Infection Control Programs Low Priority

To foster an effective infection control program, all departments within a hospital must actively support and participate in it. At seven of the nine hospitals visited, it appeared that infection control was not considered a hospitalwide program, and some hospital components gave it limited attention. For example, we found hospital commanders, medical department chiefs, and other key hospital officials who (1) were unaware of infection control issues within their hospitals or (2) did not assure that their representatives attended infection control committee meetings.

Concerning the lack of awareness, the chief of medicine at one hospital stated the program was of little benefit to his department and said his main involvement was scanning the infection control committee minutes each month. Yet, he was unaware the infection control program reported on resistant organisms[1] and told us that such a report would be very useful. The report on resistant organisms was attached to the committee minutes.

At the six remaining hospitals, the lack of support was evidenced by the attendance at the infection control committee meetings. For example, the surgery department's involvement in the infection control committee had been insufficient at one hospital on various occasions since 1983, and it was not represented at six of the eight infection control meetings held in 1988 before our visit. The infection control committee was particularly concerned about this situation because the surgical wound infection rate had recently increased and committee minutes indicated that the lack of a representative from surgery could affect the hospital's efforts to reduce the infections. Although the infection control committee had raised the lack of attendance with the surgical director four times since 1983, no action had been taken. In August 1988, the chairman of the infection control committee notified the commanding officer about the lack of surgical representation on the committee, and a representative from surgery attended the next meeting.

Hospital Management Did Not Allocate Adequate Resources to the Infection Control Program

The infection control programs at six of the nine hospitals we visited suffered because they had too few resources to carry out the program. Practitioners at two Air Force hospitals were concerned that they might not be able to meet service infection control requirements because of a lack of staff. Practitioners at four Army and Navy hospitals were meeting their services' more limited requirements and were using many of our basic elements. But some elements concerning data analysis and reporting were not being used. In addition, in response to our questionnaire, practitioners also wrote that they needed additional resources to accomplish their tasks. For instance, 25 of 77 respondents stated that they needed more staff or more of their time devoted to infection control activities, and 13 practitioners indicated that they specifically needed administrative or clerical support for their program.

Air Force regulations require one full-time practitioner for each hospital with 125 or more operating beds. However, at two Air Force hospitals

[1]Organisms that are resistant to drugs normally toxic to members of their species.

we visited (each with one full-time practitioner for about 225 occupied beds),[2] the practitioners were concerned about meeting the Air Force's requirement for continuous total surveillance and continuing to perform all other required infection control activities. In addition to identifying, analyzing, and reporting infections, these practitioners were responsible for reviewing hospital operating instructions and conducting orientation and in-service training for hospital staff. One practitioner was trying to perform total surveillance. But she stated that the program needed additional staff to perform surveillance well and also fully perform her other duties, such as reviewing policies and procedures and assisting with in-service and orientation training. At the other hospital, the practitioner was not performing surveillance for urinary tract infections because the infection control committee decided that the hospital did not have enough resources to adequately perform total surveillance.[3] Because urinary tract infections are relatively easy to cure and result in fewer severe complications, surveillance for this type of infection was terminated.

Neither the Navy nor the Army has established infection control staffing requirements,[4] and we found that a lack of resources hampered infection control activities at the hospitals visited. At one Navy hospital, no surveillance was performed while one of the two infection control practitioner positions was vacant. This situation lasted for about a year. The practitioner present at the hospital stated that she scanned lab reports for outbreaks of infections but did not have time to perform surveillance. During this time, she said she was also responsible for consulting on infection control related issues for the Naval Medical Command and other Navy hospitals, counseling employees who may have exposed themselves to hepatitis or human immunodeficiency virus, developing and reviewing infection control policies, and providing orientation and in-service training to hospital staff.

Administrative support was also a concern at six of the nine hospitals we visited. At these hospitals, the infection control staff either waited months for the committee minutes and reports to be typed or typed their own reports and meeting minutes, which took away time from their

[2]The Air Force guidance does not authorize additional practitioner positions, regardless of hospital size.

[3]This form of targeted surveillance would be acceptable under our basic elements.

[4]A draft Navy infection control regulation will, when implemented, require all Navy hospitals to have a practitioner and all teaching hospitals to have one practitioner for each 150 beds.

infection control duties. For example, the minutes of one infection control committee indicate that the committee was having difficulty maintaining program continuity and handling new and ongoing problems because committee minutes were not being typed in a timely manner. The program had no designated administrative staff and therefore used the administrative staff of the quality assurance office. The infection control committee had waited 2 to 3 months for the minutes to be typed.

Of the three services, only Air Force regulations specifically direct the hospital commander to provide appropriate administrative support to accomplish infection control program activities. But two of the Air Force hospitals we visited did not have any administrative support dedicated to the infection control program.

Adding staff to the infection control program is not the only solution to these problems. For example, one Air Force hospital we visited designated a nurse on each ward as liaison between the wards and the practitioner. These liaisons assisted with in-service training, communicated policy changes, and observed patient care practices on their wards. This arrangement allowed the practitioner, who performed this function on a part-time basis, time to concentrate on activities with the most impact, such as performing total surveillance.

Computer support is another method of decreasing the time practitioners spend on surveillance functions, particularly the analysis of infections. Infection control literature indicates that time-consuming surveillance activities (e.g., repeating monthly infection rate calculations) are especially suited for computers. Eight of the nine infection control programs at hospitals we visited had access to computers, but seven infection control staffs were using computers primarily for word processing because they lacked either training or software for analysis. For example, at one Navy hospital we visited, the practitioner collected information about infections, but did not analyze the data to determine causal factors. She told us that analyzing the data manually was extremely laborious and she lacked a computer program that could have expedited the analysis. At one Air Force hospital, the practitioner had the computer software to analyze infections but used the computer only for word processing because she did not know how to use the software.

At Army and Navy hospitals, hospital commanders are responsible for obtaining and distributing computer resources. Air Force officials told us that the Air Force has bought computers for all its infection control

programs and that most practitioners will receive infection control software by 1990. The Air Force does not have specific plans to train infection control staff in using this software, although it has required it to be simple enough for nonexperts to operate. According to an Air Force official, each hospital has a computer systems officer who is familiar with all software in the hospital. In addition, each mid-level command will have one person knowledgeable in using the software who will be available to assist hospital practitioners. We believe that formal orientation training is still necessary for infection control staff to maximize the analytical potential of such software.

Presently, DOD is designing or revising hospitalwide and servicewide computer systems.[5] When completely implemented, these systems will include quality assurance functions, including infection control program activities.

Command Monitoring of Infection Control Programs Is Inadequate

The services delegate responsibility for monitoring hospital infection control programs to their mid-level commands, which, in turn, rely upon periodic visits by their staff and inspectors general to provide information about hospital programs. None of the mid-level commands we visited required the hospitals to submit any information on their infection control program. As of October 1989, only the Navy required its mid-level staff to visit hospitals on a regular basis (annually) to monitor quality assurance,[6] including infection control. However, we found that Navy mid-level staff reviewing the infection control program did not always have expertise in infection control. Both the Army and Air Force previously reviewed infection control programs periodically, but, in 1985 and 1988, respectively, they discontinued the funding for the reviews. Currently, the Army and Air Force mid-level commands or service consultants review hospital infection control programs only when requested by the hospital or if an inspector general review identifies serious problems with the program. In lieu of periodic reviews, the Army and Air Force rely solely on inspector general reports to identify deficiencies in hospital infection control programs.

In general, we found that visits to a hospital by officials knowledgeable in infection control programs are beneficial. At two hospitals we visited

[5]As of December 1989, GAO was reviewing the installation and operation of DOD's composite health care system, which DOD estimates will be in full operation by 1995.

[6]In March 1990, DOD officials told us that the Navy no longer requires annual quality assurance monitoring visits.

(one Army and one Air Force), we found evidence that the infection control program had improved dramatically after discussions with service consultants or a visit by a mid-level official knowledgeable in infection control. At these hospitals, the practitioners had no previous experience in infection control before their being assigned as infection control practitioners. At both the hospitals, the practitioners initially followed the practice of the prior practitioner and relied on physicians or nurses to report suspected infections to them instead of performing their own surveillance for infections. Infection control literature indicates that relying on staff to report infections understates the number of infections and is not sufficient for an effective program. Shortly after being assigned to the infection control program, both practitioners requested and received assistance from service infection control consultants. As a result of implementing the consultants' suggestions, at the time of our visits, both programs had a surveillance program that included most of our basic elements.

From 1986 until our visits in 1988, the inspectors general had reviewed seven of the nine hospitals we visited. Although our review indicated that five of these seven hospitals had problems complying with existing service regulations concerning infection surveillance and committee attendance, none of the inspector general reports mentioned any infection control problems at these facilities. One of the reports discussed an infection control problem at an affiliated clinic. Inspector general teams may not be able to identify specific infection control weaknesses because they generally do not include staff knowledgeable about infection control. In addition, the guidance they follow is not specific enough to assess how effectively a program is being carried out. Army and Air Force guidelines for reviewing infection control are based on Joint Commission standards, which are broad, and the Navy inspector general does not have specific written guidelines for reviewing infection control programs.

When the inspectors general do identify problems, their recommendations can have an impact. For example, during 1987 and 1988, the Navy headquarters and regional inspectors general reviewed the infection control programs of Navy dental clinics. The inspection reports noted the presence of infection control manuals at these clinics and recommended that the Naval Medical Command develop similar manuals for its hospital infection control programs. The Naval Medical Command assembled a team to write manuals for infection control in hospital and outpatient settings. The manuals were completed in January 1989.

DOD agrees that hospital infection control programs can benefit from official visits by professionals with infection control credentials. DOD further agreed that, although inspector general teams review infection control programs for the services, the services lack guidance requiring either regular evaluation of infection control programs or provisions for planned and systematic consultation and assistance.

Conclusions

Hospital management has finite resources available and must allocate them to the areas of highest priority. As could be expected, our visits to nine hospitals showed that the hospital infection control programs had differing levels of resources. We believe it is the responsibility of each service to determine the priority that should be given to infection control programs and assure that the resources assigned by the hospital commander reflects that priority. Factors that should be considered include the minimum level of staff, computer, and other resources needed to support the level of effort desired in a service's infection control program. We believe that infection control is a high-priority area, and hospital management should not only give their programs adequate resources but recognition in the form of public support for the principles of infection control and encouragement of infection control activities.

The services should also periodically visit hospitals to assure that (1) an appropriate level of resources has been allocated to infection control, (2) the program is supported throughout the hospital, and (3) the program is performing the appropriate activities. We found that hospital visits by headquarters or mid-level command staff familiar with infection control practices and programs are particularly helpful when new infection control practitioners are assigned to a hospital. During this type of visit the headquarters or mid-level staff function more as an advisor rather than a reviewer. Further, hospital visits augment and complement inspector general reviews. Using both the staff assistance visits and inspector general reviews, the services should have more assurance that infection control programs are effective.

Recommendations

We recommend that the Secretary of Defense direct the service secretaries, in conjunction with the Assistant Secretary for Health Affairs, to

- require the surgeons general to determine the relative priority of the infection control programs in relation to other hospital activities and assure that hospitals provide adequate resources for infection control, and

- assure that headquarters or mid-level command staff who are familiar with infection control program activities make periodic visits to each hospital to provide technical assistance to the infection control program.

Agency Comments

In its March 28, 1990, letter, DOD agreed with both of our recommendations and stated that by May 1990 action will be taken to implement them. Specifically, DOD will direct the surgeons general to

- reemphasize the importance of infection control programs to achieve quality patient outcomes;
- review infection control programs and assets, relative to resources, and take corrective action as appropriate; and
- provide for both technical assistance and regular evaluation of the full scope of hospital infection control programs.

In addition, DOD will pursue refinement and implementation of automated support systems such as the existing Automated Quality of Care Evaluation Support System and the Composite Health Care System currently being developed and tested.

Methodology Used to Develop the Basic Elements of an Infection Control Program

To develop the basic elements, we first consulted with officials of the organizations and the individual listed below:

- American Hospital Association.
- Association for Practitioners in Infection Control.
- Centers for Disease Control.
- Joint Commission on Accreditation of Healthcare Organizations.
- Society of Hospital Epidemiologists of America.
- Robert W. Haley, M.D., who directed CDC's SENIC study.

We discussed the activities they thought were necessary for an effective infection control program and, working with CDC officials, compiled a comprehensive list of elements. The list was sent to the above organizations (except CDC) as well as the organizations listed below:

- American Public Health Association.
- Association of Operating Room Nurses, Inc.
- Association of State and Territorial Health Officials.
- Surgical Infection Society.

We asked each to indicate which elements could be considered minimum requirements for an effective infection control program. From their responses, we developed a list of the elements that six or more agreed were minimum requirements and, subsequently, discussed these with CDC infection control experts.

Using existing Joint Commission standards, published studies demonstrating the effectiveness of an element, and CDC's judgment as to whether the element would be widely supported by infection control experts, we arrived at a final list of 56 elements. CDC officials believe these elements represent a good basic infection control program.

Basic Elements of an Infection Control Program

The basic elements are divided into five groups: general elements, bloodstream infections, pneumonia, surgical wound infections, and urinary tract infections. The general group includes 14 elements that apply to all hospitals and address program structure, surveillance activities, and control activities. The remaining four groups of elements are organized by the four major types of infection and address surveillance activities (identification, analysis, and reporting) specific to each type.

The elements allow for both total and target surveillance. A program performing total surveillance monitors all four major types of infection in every hospital patient, on either a periodic or continuous basis. A program that targets surveillance identifies the areas of highest infection risk or concern and focuses its attention on only those areas: for example, patients in the intensive care unit or all bloodstream infections. The specific elements applicable to an infection control program depend on whether the program uses total or target surveillance:

Total surveillance—all five groups of elements would be used; however, a few individual elements would not be applicable (see the basic elements).

Target surveillance—the general elements always would be used, and depending on the type(s) of infections being targeted in the high risk groups, the other appropriate groups of elements would be used (i.e., bloodstream, pneumonia, surgical wound, or urinary tract).

Although the basic elements place emphasis on surveillance activities, an infection control program cannot be effective without control activities. We included in our list only the broad categories of control functions because control activities, unlike surveillance activities, are performed not only by the infection control staff but by other hospital personnel. CDC has published detailed recommendations on procedures to be followed by providers to prevent infections. Further, control activities that (1) are carried out by the program and (2) are beneficial to all hospitals are difficult to specify because the appropriate control activities depend heavily on the surveillance findings and the circumstances within the individual hospital.

The list of elements that follows is not all inclusive; the elements in the tables form a basic rather than an optimal program. Therefore, the elements should be used in conjunction with other standards, such as the Joint Commission's accreditation standards and CDC's guidelines.

Table II.1: General Elements (These Apply to All Hospitals)

Structure
G1. The hospital has at least a part-time infection control practitioner.
G2. The hospital has a physician who supervises or consults in the infection control program and has taken at least one training course in hospital infection control.
G3. The hospital has a multidisciplinary infection control committee.
G4. Permanent membership on the committee includes representation from the following: —hospital administration, —microbiology laboratory (if one exists), —medical staff, and —nursing service.
G5. The committee meets at least every 2 months.
Surveillance activities
G6. The infection control program performs surveillance for at least one of the four major infection sites (bloodstream, pneumonia, surgical wound, and urinary tract).
G7. The hospital's infection control program has written standardized criteria (definitions) for nosocomial infections at specific sites.
G8. The infection control program has a system to detect and control outbreaks of infections.
Control activities
G9. The hospital's infection control program assists in developing and revising hospital departments' policies and procedures as they relate to infection control issues.
G10. The hospital's infection control program assists in developing a system for reporting infections or infection exposures of employees.
G11. The hospital's infection control program assists in identifying and developing infection control topics for orientation classes.
G12. The hospital's infection control program assists in identifying and developing infection control topics for in-service training.
G13. The hospital's infection control program monitors or assists in monitoring the hospital staff's compliance with specific patient care practices, such as aseptic techniques during intravenous catheter insertion and maintenance of insertion sites.
G14. Infection control practitioners and registered nurses on hospitals units have written authority to implement isolation procedures in an emergency without a physician's order.

Table II.2: Bloodstream Infections

	Applicability to surveillance type	
	Total	**Target**
Identification		
B1. A hospital's infection control program uses at least one of the following case-finding approaches to identify bloodstream infections either in all patients or in a subset of patients: —Review results of blood cultures in all patients in target population. —Review all patients' charts in target population. —Review all patients' fever charts in target population.	X	X
B2. During the surveillance period, a hospital's infection control program performs an acceptable case-finding approach (previous criterion) on an average of every 3 days.[a]	X	X
B3. In their case-confirmation effort, infection control staff perform at least one of the following activities if they do not review all patients' charts in target population as a case-finding activity: —Review results of blood cultures in patients in target population, identified through case finding (if they do not review results of blood cultures in all patients in target population as a case-finding activity). —Review patients' charts in target population, identified through case finding.	X	X
Analysis[b]		
B4. The infection control program has developed initial baseline rates for nosocomial bloodstream infections within the hospital.	X	X
B5. Infection control staff analyze nosocomial bloodstream infection data by pathogen.	X	X
B6. Infection control staff analyze data on nosocomial bloodstream infections by whether or not patient had peripheral and/or central IV cannulation.		X
B7. Infection control staff analyze nosocomial bloodstream infection data by ward.	X	X

(continued)

	Applicability to surveillance type	
	Total	Target
Reporting		
B8. Infection control staff report summarized/analyzed data on nosocomial bloodstream infections to the infection control committee.	X	X
B9. Infection control staff report summarized/analyzed data on nosocomial bloodstream infections to the supervisor of the IV therapy team, if one exists.		X
B10. Infection control staff report summarized/analyzed data to the ward supervisors or head nurses.	X	X

Table II.3: Pneumonia

	Applicability to surveillance type	
	Total	**Target**
Identification		
P1. A hospital's infection control program uses at least one of the following case-finding approaches to identify pneumonia either in all patients or in a subset of patients: —Review all patients' Kardexes in target population. —Ask nurses about signs or symptoms of a respiratory infection in all patients in target population. —Review all patients' charts in target population.	X	X
P2. During the surveillance period, a hospital's infection control program performs an acceptable case-finding approach (previous criterion) on an average of every 3 days.[a]	X	X
P3. In their case-confirmation effort, infection control staff perform at least one of the following activities if they do not review all patients' charts in target population as a case-finding activity: —Review lab and X-ray results for evidence of pneumonia in patients in target population, identified through case finding (if they do not review lab and X-ray results in all patients in target population as a case-finding activity). —Review patients' charts in target population, identified through case finding.	X	X
Analysis[b]		
P4. The infection control program has developed initial baseline rates for nosocomial pneumonia within the hospital.	X	X
P5. Infection control staff analyze data on nosocomial pneumonia by pathogen.	X	X
B6. Infection control staff analyze data on nosocomial pneumonia by whether or not patient was on a ventilator, if target population includes ventilator patients.		X
P7. Infection control staff analyze data on nosocomial pneumonia by ward.	X	X
P8. Infection control staff analyze data on nosocomial pneumonia by whether or not patient had surgery, if target population includes surgical patients.	X	X

(continued)

	Applicability to surveillance type	
	Total	Target
Reporting		
P9. Infection control staff report summarized/analyzed data on nosocomial pneumonia to the infection control committee.	X	X
P10. If target population includes ventilator patients, infection control staff report summarized/analyzed data on nosocomial pneumonia to the respiratory therapy department, if one exists.		X
P11. Infection control staff report summarized/analyzed data on nosocomial pneumonia to the ward supervisors or head nurses.	X	X

Table II.4: Surgical Wound Infections

	Applicability to surveillance type	
	Total	Target
Identification		
S1. A hospital's infection control program uses at least one of the following case-finding approaches to identify surgical wound infections either in all surgical patients or in a subset of surgical patients: —Review results of gram stains and cultures of wounds in all patients in target population, and ask nurses about signs or symptoms of surgical wound infections in all patients in target population. —Review all surgical patients' Kardexes in target population. —Review all surgical patients' charts in target population.	X	X
S2. During the surveillance period, a hospital's infection control program conducts case finding using an acceptable approach (previous criterion) on an average of every 3 days.[a]	X	X
S3. In their case-confirmation effort, infection control staff perform at least one of the following activities if they do not review all surgical patients' charts in target population as a case-finding activity: —Review results of gram stains and wound cultures for patients in target population identified through case finding (if they do not review gram stains and wound cultures for all patients in target population as a case-finding activity). —Review surgical patients' charts in target population identified through case finding. —Ask nurses about signs or symptoms of surgical wound infections in patients in target population identified through case finding (if they do not ask nurses about signs or symptoms of surgical wound infections in all patients in target population as a case-finding activity).	X	X
Analysis[b]		
S4. The infection control program has developed initial baseline rates for surgical wound infections in the hospital.	X	X
S5. Infection control staff analyze surgical wound infection data by surgeon.	X	X
S6. Infection control staff analyze surgical infection data by type of wound classification (for example, clean, clean-contaminated, contaminated, and dirty).		X
S7. Infection control staff analyze surgical wound infection data by pathogen.	X	X
S8. Infection control staff analyze surgical wound infection data by ward.	X	X

(continued)

	Applicability to surveillance type	
	Total	Target
Reporting		
S9. Infection control staff report summarized/analyzed data on surgical wound infections to the infection control committee.	X	X
S10. Infection control staff report summarized/analyzed data on surgical wound infections to the surgical complications committee, if one exists.	X	X
S11. Infection control staff report summarized/analyzed data on surgical wound infections to the chief of the surgical service.	X	X
S12. Infection control staff report summarized/analyzed data on surgical wound infections to the operating room supervisor.	X	X
S13. Practicing surgeons receive surgeon-specific infection rates.	X	X

Table II.5: Urinary Tract Infections

	Applicability to surveillance type	
	Total	**Target**
Identification		
U1. A hospital's infection control program uses at least one of the following case-finding approaches to identify urinary tract infections either in all patients or in a subset of patients: —Review all patients' Kardexes in target population. —Review results of urine cultures in all patients in target population, and ask nurses about signs or symptoms of a urinary tract infection in all patients in target population. —Review all patients' charts in target population.	X	X
U2. During the surveillance period, a hospital's infection control program performs an acceptable case-finding approach (previous criterion) on an average of every 3 days.[a]	X	X
U3. In their case-confirmation effort, infection control staff perform at least one of the following activities if they do not review all patients' charts in target population as a case-finding activity: —Review results of urine cultures in patients in target population, identified through case finding (if they do not review lab results of urine cultures in all patients in target population as a case-finding activity). —Review patients' charts in target population, identified through case finding.	X	X
Analysis[b]		
U4. The infection control program has developed initial baseline rates for nosocomial urinary tract infections within the hospital.	X	X
U5. Infection control staff analyze data on nosocomial urinary tract infections by pathogen.	X	X
U6. Infection control staff analyze data on nosocomial urinary tract infections by ward.	X	X

(continued)

	Applicability to surveillance type	
	Total	Target
Reporting		
U7. Infection control staff report summarized/analyzed data on nosocomial urinary tract infections to the infection control committee.	X	X
U8. Infection control staff report summarized/analyzed data on nosocomial urinary tract infections to the ward supervisors or head nurses.	X	X

[a]Important infection control problems may require case finding more frequently than every 3 days.

[b]The proper analysis of infection data requires calculation of infection rates in specific patient risk groups, as well as frequency distributions and line listings of the infections. If infection rates are to be useful for estimating infection risks in patient groups, appropriate data should be collected. For example, if bloodstream infections caused by intravenous catheters are being analyzed, then both the number of patients with intravenous catheters and the number of those patients who develop bloodstream infections are needed.

Methodology for Sampling Nonfederal Hospitals

The sample of nonfederal hospitals for this study was selected from the 1985 listing of American Hospital Association (AHA) memberships. Since our questionnaire on infection control was not relevant to very small hospitals, we excluded memberships with fewer than 50 beds before selecting the sample. Of the 4,411 memberships with 50 or more beds, we selected a stratified sample of 550. To insure statistically reliable estimates for small, medium, and large hospitals, as well as for teaching and nonteaching hospitals, the sample was selected from five subgroups (strata) of hospitals (see table III.1).

Table III.1: Nonfederal Hospitals—Sample Sizes and Response Rates by Strata

Bed size/affiliation	1985 AHA memberships	Initial sample	Adjusted sample[a]	Number of responses/ (response rate)
50-99 beds	1,350	110	110	84 (76%)
100-399 beds/nonteaching	2,133	110	111	92 (83%)
100-399 beds/teaching	376	110	110	95 (86%)
400 or more beds/nonteaching	141	90	102	93 (91%)
400 or more beds/teaching	411	130	134	116 (87%)
Total	**4,411**	**550**	**567**	**480 (85%)**

[a]Adjusted sample reflects number of hospitals included in survey after adding extra hospitals identified as part of a group membership.

Because we were aware that a small proportion of AHA memberships covered more than one hospital, we used the 1985 AHA guide to identify which of the sampled memberships may have represented multiple hospitals. We then made telephone calls to determine whether those memberships in fact represented more than one hospital and, if so, obtained addresses for each such hospital. As a result of this effort, we discovered in the sample 12 multiple memberships covering 29 hospitals. Consequently, an additional 17 hospitals were added to the sample, resulting in an "adjusted sample" of 567 hospitals.

We obtained responses from 85 percent (480 of 567) of the hospitals to which we mailed questionnaires. Among the sampled subgroups, the response rate ranged from 76 to 91 percent (see table III.1).

While the initial sample of hospital memberships was stratified according to the AHA information on total number of beds for the membership, our results are presented according to the number of acute care beds reported by the hospital. We excluded 37 hospitals that reported having fewer than 50 acute care beds. Consequently, our results are based on the 443 hospitals that reported having 50 or more acute care beds.

Because data from 443 hospitals are used to make estimates about the universe of nonfederal hospitals with 50 or more beds (estimated number is 3,872 hospitals), all data in this report on nonfederal hospitals are subject to sampling error. The size of the sampling error reflects the precision of the estimate; the smaller the sampling error, the more precise the estimate.

Sampling errors for reported estimates about nonfederal hospitals are presented in table III.2 at the 95-percent confidence level. This means that the chances are about 19 out of 20 that the actual number or percentage being estimated falls within the range defined by our estimate plus or minus the sampling error.

Table III.2: Estimates and Corresponding Sampling Errors for Nonfederal Hospitals

Element	Estimated number of applicable hospitals	Estimated percent that comply	Sampling error at 95-percent confidence level (percentage points)
G2. Trained physician consultant			
(50 to 399 bed hospitals)	3,363	45	7
(400 or more bed hospitals)	509	54	6
G14. Practitioners and registered nurses have isolation authority			
(100 to 399 bed hospitals)	2,184	58	9
(400 or more bed hospitals)	509	55	6
Bloodstream infections			
B2. Case finding every 3 days	3,648	83	5
B4. Baseline rates	3,648	63	6
B7. Analyze data by ward	3,648	82	5
B9. Report data to IV team	494	57	17
B10. Report data to ward supervisors	3,648	56	7
Pneumonia			
P2. Case finding every three days	3,546	60	7
P4. Baseline rates	3,546	68	6
P7. Analyze data by ward	3,546	83	5
P10. Report data to respiratory therapy department	1,054	60	11
P11. Report data to ward supervisors	3,546	60	7
Surgical wound infections			
S2. Case finding every 3 days	3,732	55	6
S4. Baseline rates	3,732	74	5
S5. Analyze data by surgeon	3,732	80	5
S10. Report data to surgical complications committee	1,975	62	8

(continued)

Element	Estimated number of applicable hospitals	Estimated percent that comply	Sampling error at 95-percent confidence level (percentage points)
S13. Practicing surgeons receive surgeon-specific data	3,732	20	5
Urinary tract infections			
U2. Case finding every 3 days	3,586	55	7
U4. Baseline rates	3,586	71	6
U6. Analyze data by ward	3,586	85	5
U8. Report data to ward supervisors	3,586	65	6

Military Hospitals Visited

Department of the Air Force	832nd Medical Group, Luke Air Force Base, Arizona Malcolm Grow USAF Medical Center, Andrews Air Force Base, Maryland U.S. Air Force Medical Center, Keesler Air Force Base, Mississippi
Department of the Army	Dewitt Army Hospital, Ft. Belvoir, Virginia Kimbrough Army Hospital, Ft. Meade, Maryland William Beaumont Army Medical Center, Ft. Bliss, Texas
Department of the Navy	U.S. Naval Hospital, Bethesda, Maryland U.S. Naval Hospital, Camp Pendleton, California U.S. Naval Hospital, San Diego, California

Military and Nonfederal Hospitals' Use of GAO's Basic Elements

Basic element	Military hospitals		Nonfederal hospitals[a] (estimated)	
	Number applicable	Percent using	Number applicable	Percent using
General element				
G1. Hospital has an infection control practitioner	77	99	3,872	100
G2. Trained physician consultant	77	32	3,872	46
G3. Multidisciplinary infection control committee	77	100	3,872	99
G4. Appropriate permanent committee membership	77	75	3,872	91
G5. Meets at least every 2 months	77	100	3,872	94
G6. Surveillance for at least one of the four major infection sites	77	99	3,872	98
G7. Written criteria for infections at specific sites	77	92	3,872	97
G8. System to detect and control outbreaks of infections	77	97	3,872	97
G9. Helps to develop hospital infection control policies and procedures	77	100	3,872	100
G10. Helps to develop a system for reporting employee infections	77	97	3,872	97
G11. Helps to develop infection control topics for orientation classes	77	95	3,872	88
G12. Helps to develop infection control topics for in-service training	77	95	3,872	96
G13. Practitioners monitor compliance with specific patient care practices	77	94	3,872	85

(continued)

Basic element	Military hospitals		Nonfederal hospitals[a] (estimated)	
	Number applicable	Percent using	Number applicable	Percent using
G14. Practitioners and registered nurses have isolation authority	77	75	3,872	63
Bloodstream infections:				
B1. Appropriate case-finding approach	74	96	3,648	99
B2. Case finding at least every 3 days	74	77	3,648	83
B3. Appropriate case-confirmation approach	74	99	3,648	100
B4. Baseline rates	74	53	3,648	63
B5. Analyze data by pathogen	74	93	3,648	97
B6. Analyze data by whether patient had IV	27	93	1,177	90
B7. Analyze data by ward	74	84	3,648	82
B8. Report data to infection control committee	74	99	3,648	99
B9. Report data to IV team	4	25	494	57
B10. Report data to ward supervisors	74	50	3,648	56
Pneumonia:				
P1. Appropriate case-finding approach	68	90	3,546	93
P2. Case finding at least every 3 days	68	66	3,546	60
P3. Appropriate case-confirmation approach	68	99	3,546	100
P4. Baseline rates	68	53	3,546	68
P5. Analyze data by pathogen	68	97	3,546	97

(continued)

Basic element	Military hospitals		Nonfederal hospitals[a] (estimated)	
	Number applicable	Percent using	Number applicable	Percent using
P6. Analyze data by whether or not patient was on a ventilator	18	94	976	90
P7. Analyze data by ward	68	85	3,546	83
P8. Analyze data by whether or not patient had surgery	67	90	3,485	93
P9. Report data to infection control committee	68	100	3,546	99
P10. Report data to respiratory therapy department	17	24	1,054	59
P11. Report data to ward supervisors	68	53	3,546	60
Surgical wound infections:				
S1. Appropriate case-finding approach	76	92	3,732	93
S2. Case finding at least every 3 days	76	58	3,732	55
S3. Appropriate case-confirmation approach	76	99	3,732	99
S4. Baseline rates	76	66	3,732	74
S5. Analyze infection data by surgeon	76	78	3,732	80
S6. Analyze data by type of wound	29	79	1,262	91
S7. Analyze data by pathogen	76	92	3,732	96
S8. Analyze data by ward	76	80	3,732	80
S9. Report data to infection control committee	76	100	3,732	99

(continued)

Basic element	Military hospitals		Nonfederal hospitals[a] (estimated)	
	Number applicable	Percent using	Number applicable	Percent using
S10. Report data to surgical complications committee	38	63	1,975	62
S11. Report data to chief of surgery	76	89	3,732	80
S12. Report data to operating room supervisor	76	84	3,732	91
S13. Practicing surgeons receive surgeon-specific infection rates	76	20	3,732	20
Urinary tract infections:				
U1. Appropriate case-finding approach	75	85	3,586	90
U2. Case finding at least every 3 days	75	55	3,586	55
U3. Appropriate case-confirmation approach	75	99	3,586	98
U4. Baseline rates	75	55	3,586	71
U5. Analyze data by pathogen	75	96	3,586	98
U6. Analyze data by ward	75	80	3,586	85
U7. Report data to infection control committee	75	100	3,586	99
U8. Report data to ward supervisors	75	47	3,586	65

[a]The number of nonfederal hospitals applicable represents an estimate for the universe of all nonfederal hospitals, based upon responses to our questionnaire, and sampling errors must be taken into account when drawing conclusions from the percentages (see app. III).

Military Hospitals' Use of Selected Infection Control Basic Elements

Chapter 2 compares the military, VA, and nonfederal hospitals' use of our basic elements and concludes that these three hospital sectors are similar in their use of the elements. However, within the military, we found differences in the services' use of specific elements. The tables that follow detail the use of some of our basic elements among Air Force, Army, and Navy hospitals. The elements selected were those generally not used by military hospitals and correspond to the elements in tables 2.1 to 2.4 in chapter 2.

Table VI.1: Hospitals That Do Not Have Physician Consultants/Supervisors Trained in Infection Control

Hospital entity	Number of hospitals	Hospitals without physicians trained in infection control	
		Number	Percentage
Army	32	22	69
Navy	22	13	59
Air Force	23	17	74
Total	**77**	**52**	**68**

Table VI.2: Hospitals Not Performing Case Finding at Least Every 3 Days

Hospital entity	Number of hospitals	Hospitals not performing element	
		Number	Percentage
Surgical wound surveillance			
Army	31	19	61
Navy	22	5	23
Air Force	23	7	30
Total	**76**	**31**	**41**
Pneumonia surveillance			
Army	26	11	42
Navy	21	4	19
Air Force	21	7	33
Total	**68**	**22**	**32**
Urinary tract surveillance			
Army	31	21	68
Navy	22	6	27
Air Force	22	6	27
Total	**75**	**33**	**44**

Table VI.3: Hospitals Conducting Surveillance That Do Not Have Baseline Rates

Hospital entity	Number of hospitals	Hospitals not performing element	
		Number	Percentage
Bloodstream surveillance			
Army	30	13	43
Navy	22	11	50
Air Force	22	10	45
Total	**74**	**34**	**46**
Surgical wound surveillance			
Army	31	13	42
Navy	22	6	27
Air Force	23	7	30
Total	**76**	**26**	**34**
Pneumonia surveillance			
Army	26	11	42
Navy	21	12	57
Air Force	21	8	38
Total	**68**	**31**	**46**
Urinary tract surveillance			
Army	31	12	39
Navy	22	13	59
Air Force	22	8	36
Total	**75**	**33**	**44**

Table VI.4: Hospitals Analyzing Infections, but Not Reporting Results to Appropriate Personnel

Hospital entity	Number of hospitals performing analysis	Hospitals not reporting results to appropriate personnel	
		Number	Percentage
Bloodstream infection data to ward supervisors			
Army	25	11	44
Navy	19	7	37
Air Force	18	6	33
Total	**62**	**24**	**39**
Pneumonia infection data to ward supervisors			
Army	20	10	50
Navy	19	7	37
Air Force	19	4	21
Total	**58**	**21**	**36**
Urinary tract infection data to ward supervisors			
Army	22	13	59
Navy	20	8	40
Air Force	18	4	22
Total	**60**	**25**	**42**
Surgical wound infection data to practicing surgeons			
Army	22	19	86
Navy	19	13	68
Air Force	18	10	56
Total	**59**	**42**	**71**

Comments From the Department of Defense

THE ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301-1200

HEALTH AFFAIRS

28 MAR 1990

Mr. David P. Baine
Director, Federal Health Care
Delivery Issues
Human Resources Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Baine:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "INFECTION CONTROL: Military Programs are Comparable to VA and Nonfederal Programs but Can Be Enhanced," dated February 1, 1990 (GAO Code Code 101337/OSD Case 8236). The DoD concurs with the GAO findings and recommendations. The DoD will continue efforts to facilitate and improve program management practices through the implementation and refinement of automated data systems. In addition, the DoD will forward a memorandum within 60 days, directing that the Services:

-- Adopt infection control policies that reflect the intent of the GAO elements and are in compliance with current Joint Commission on Accreditation of Healthcare Organizations Standards and/or those of other nationally recognized experts as appropriate. (The policies should describe the level of support required for the program).

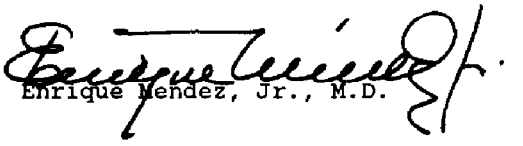
-- Reemphasize the importance of infection control programs to quality patient outcomes.

-- Review infection control programs and assets, relative to resources, and take corrective action as appropriate.

It is DoD policy that hospitals have programs for the continuous monitoring of patient care. Patients have the right to care and treatment in a safe environment. The DoD appropriately delegates responsibility for the development of policies and procedures related to infection control to Service experts. The DoD agrees that each Service must specify the elements basic to its infection control program and describe the level of support required for the maintenance of the program. The DoD fully supports the value of official technical assist and evaluation visits by knowledgeable professionals, and recognizes that DoD programs can benefit from increased policy guidance and management attention.

The detailed DoD comments on the report findings and recommendations are provided in the enclosure. A few additional technical corrections were separately provided. The Department appreciates the opportunity to comment on the GAO draft report.

Sincerely,



Enrique Mendez, Jr., M.D.

Enclosure
as stated

GAO DRAFT REPORT - DATED FEBRUARY 1, 1990
(GAO CODE 101337) OSD CASE 8236

"INFECTION CONTROL: MILITARY PROGRAMS ARE COMPARABLE TO VA AND NONFEDERAL PROGRAMS BUT CAN BE ENHANCED"

DEPARTMENT OF DEFENSE COMMENTS

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FINDINGS

FINDING A: Basic Elements Of An Infection Control Program. The GAO reported that the Office of the Assistant Secretary of Defense for Health Affairs has delegated responsibility for the development and implementation of policies and procedures related to infection control to the Military Services. The GAO further reported that, in turn, the Services require their hospitals to operate infection control programs to identify existing infections and help prevent future occurrences.

The GAO explained that, in order to assess the programs operating in military hospitals, it needed criteria outlining the basic elements of an effective infection control program. The GAO found, however, that the program guidance developed by the DoD was too broad to serve this purpose. The GAO also found that the guidance on infection control programs that existed in the health care community, in general, was either outdated, did not cover all the major components of a program, or was not specific as to the basic elements of a program. The GAO reported, therefore, that it worked with representatives of nine organizations and one other individual with expertise in infection control to develop a list of 56 basic elements of an effective program in five categories--(1) general elements, (2) bloodstream infections, (3) pneumonia, (4) surgical wound infections, and (5) urinary tract infections. The GAO noted that these elements are applicable to infection control in any hospital with over 50 acute-care beds. The GAO reported that it used these elements to examine military hospital infection control programs. The GAO collected information through onsite visits to nine military hospitals, as well as through a questionnaire sent to all 79 military hospitals with more than 50 acute-care beds, to all Veterans Administration medical centers, and to a sample of 567 nonfederal hospitals. (pp. 2-3, pp. 12-14, pp. 23-28, pp. 58-72, GAO Draft Report)

Now on pp. 2-3, 11 to 13, 17 to 20, and 38 to 48.

DoD Response: Concur. The DoD agrees that in order to assess infection control programs operating in military hospitals, Service program guidelines are needed. The DoD delegates responsibility for the development and implementation of policies

and procedures related to infection control to the Services. Program components should be approved and periodically revised by content experts within each Service. Infection control practices are not static and must be regularly evaluated.

The elements developed by the GAO contain important components of an infection control program. These components were considered by the Joint Commission on Accreditation of Healthcare Organizations in the revision and publication of the 1990 Infection Control Standards.

Of note, the 1990 edition of the Accreditation Manual for Hospitals has revised completely the Infection Control Standards. The changes, contained in Appendix B of the 1990 edition, were summarized as follows:

> "The new infection control standards and required characteristics are less detailed, include more liberalized surveillance definitions to accommodate methods other than whole house surveillance (for example, focused surveillance or surveillance by objectives), place greater emphasis on prevention and control of infection, and are less prescriptive with regard to the structure of the infection control program, thereby broadening a hospital's flexibility in adopting state-of-the-art infection control practices."

In view of these recent improvements, the DoD shall continue to require a compliance with Joint Commission Standards for all fixed hospitals of more than a 25 bed capacity.

The DoD agrees that each Service has an obligation to its patients and practitioners to attempt to identify improved infection control practices and the levels of support required for the programs.

FINDING B: Military Practitioners Utilize Many Basic Elements on Their Own Initiative. The GAO found that Service guidance on infection control programs requires the use of few of the elements developed by the GAO. The GAO reported, for example, that of the 56 elements it developed, Air Force instructions specify 31 elements, Navy instructions 13, and Army instructions 10. Based on its analysis of questionnaire results, however, the GAO found that 41 of the 56 elements were actually being used by at least 70 percent of military hospitals when such use was appropriate--a utilization rate the GAO characterized as excellent and largely attributable to the professionalism of the practitioners. The GAO reported, for example, that practitioners at the nine hospitals visited took the initiative to take training, contact others, or read literature on infection control programs. The GAO observed that, as a result, some activities went beyond Service guidance and included many of the basic elements developed by the GAO. The GAO noted the extent of the elements usage in military hospitals was similar to that found in both Veterans Administration medical centers and nonfederal hospitals. (p.3, p.23, pp. 28-29, pp. 79-83, GAO Draft Report)

Now on pp. 3, 17, 20-21, and 49-57.

-2-

DoD Response: Concur. It is DoD policy that hospitals have programs for the continuous monitoring and evaluation of patient care. The prevention of infection is a fundamental goal of clinical practice. Infection control is an essential element of peer review and a category of evaluation required for the granting of clinical privileges. Patient care providers are taught to prevent infection, promote health, and protect both patients and co-workers from infection.

It is also DoD policy that military hospitals comply with Joint Commission guidelines. The 1990 Accreditation Manual for Hospitals Standard IC.2.1.2 states that "the infection control committee includes an individual whose credentials document knowledge of, and special interest or experience in, infection control." Standard IC.3 states that "responsibility for the management of infection surveillance, prevention, and control is assigned to a qualified person." Standard IC.3.1 requires that "there be documented evidence that the person has education, training, or supervised experience related to infection surveillance, prevention and control." Finally, IC.4.1. states that "all personnel are competent to participate in infection monitoring, prevention, and control activities and are provided with any necessary orientation, on-the-job and in-service training, and continuing education."

FINDING C: Some of The Basic Elements Are Not As Widely Used. The GAO found that 15 of the basic elements it identified were not being used as frequently as the 41 elements referred to in Finding B. According to the GAO, these elements related to the following:

-- the availability of a trained physician consultant for the infection control program;

-- the specific frequency with which surveillance activities should take place;

-- the development of baseline rates for specific types of infection; and

-- the submission of analyzed infection data to personnel, who can take preventive actions.

The GAO provided a comparative analysis of the utilization of the elements by military, Veterans Administration, and nonfederal hospitals. The GAO pointed out that it did not ask the questionnaire respondents why these elements were not as widely used as others. The GAO observed, however, that one of these elements represents time consuming surveillance activities. In addition, the GAO observed that none of these elements were required by Service regulations. Rather, the GAO observed that the Service written guidance lags behind the practitioners' activities and, in many cases, is so general that it is of questionable value. The GAO concluded that failure to use these

-3-

Now on pp. 4, 17, 21 to 27, 28, and 58 to 60.

elements hampers the effectiveness of an infection control program. The GAO further concluded that the use of the elements it identified, packaged as a basic infection control program in each Service regulation, would improve the effectiveness of the military programs. (p. 4, p. 23, pp. 29-41, p. 44, pp. 84-87, GAO Draft Report)

DoD Response: Concur. The DoD agrees that a successful infection control program should incorporate recognized essential elements. Accordingly, as discussed in the DoD response to Recommendation 1, by May 1990, the Office of the Assistant Secretary of Defense (Health Affairs) will direct the Services to adopt infection control policies that reflect the intent of the GAO elements and are in compliance with Joint Commission Standards. It should be understood that "essential elements" may change. For example, the 1990 Joint Commission Infection Control Standards no longer require the availability of a trained physician consultant.

Now on p. 27.

FINDING D: Military And Veterans Administration Use of One Element Differs Significantly. The GAO noted that one basic element was used significantly less in the nonfederal sector than it was in military and Veterans Administration hospitals, the element requiring that infection control practitioners and registered nurses have authority to implement isolation procedures in an emergency without a doctor's order--and that this authority be in writing. According to the GAO, its questionnaire results showed that about 23 percent of military hospitals and 22 percent of Veterans Administration medical centers did not give practitioners and nurses this authority. The GAO reported that conversely, about 37 percent of nonfederal hospitals did not give nurses this authority. (p. 42, GAO Draft Report)

DoD Response: Concur. The 1990 Joint Commission Infection Control Standards (IC.2.5) state that "the authority of the infection control committee, or its designee, to institute any surveillance, prevention, and control measures or studies when there is reason to believe that any patient or personnel may be in danger, is defined in writing and approved by the administration and medical staff." Service compliance with this standard is necessary to achieve accreditation status.

FINDING E: Army and Air Force Consultants Support the Use of the GAO Elements. The GAO reported that DoD officials generally agreed with most of the GAO basic elements used as criteria for an infection program. In addition, the GAO reported that Army and Air Force infection control consultants supported the use of the GAO basic elements. The GAO cited several examples of the importance of the elements not widely used, as follows:

-- the Army consultant stated that, when surveillance is not conducted at least every three days, practitioners miss opportunities to take corrective measures before infections spread;

-- an Air Force consultant stated that military hospitals should not compare their rates with Centers for Disease Control rates, because of differences in patient populations with nonfederal hospitals;

-- in addition, the Army consultant noted the importance of developing baseline rates because, without service-specific baseline rates, hospital officials do not know if their current rates are outside the normal threshold; and

-- an Air Force consultant was concerned that ward Supervisors, who can greatly influence patient care practices, are not receiving infection control data about their patients.

Overall, the GAO observed that the elements it developed are (1) fundamental, (2) generally accepted by infection control practitioners in both public and private sectors, and (3) supported by organizations knowledgeable about infection control. The GAO concluded that, cumulatively, the elements form the basis for an effective infection control program, whether in Federal or nonfederal hospitals. (pp. 42-44, GAO Draft Report)

Now on p. 20.

DoD Response: Concur. The DoD agrees that several of the GAO elements are fundamental components of a comprehensive infection control program and could be incorporated into Service guidelines. (See the DoD response to Finding A and Recommendation 1).

FINDING F: Hospital Management Places A Low Priority On Infection Control Programs. The GAO observed that, in order to foster an effective infection control program, all departments within a hospital must actively support and participate in the program. The GAO found, however, that at seven of the nine hospitals visited, it appeared that infection control was not considered a hospital-wide program--and it was given limited attention by some hospital components. The GAO cited several examples where hospital commanders, medical department chiefs, and other key hospital officials gave infection control programs low priority. At one hospital, the GAO reported the chief of medicine was unaware of an infection control report that was available within his hospital. At the six other hospitals, the

Now on pp. 4, and 30-31.

GAO found the lack of support was evidenced by the low attendance at the infection control committee meetings. The GAO noted that, at one hospital, the surgery department's involvement in the infection control committee had been insufficient for at least five years--and it was not represented at six of the eight infection control meetings held in early 1988. The GAO concluded that the low priority given infection control programs by hospital management is one indication that hospital management does not emphasize infection control. (p. 5, pp. 45-48, GAO Draft Report)

DoD Response: Concur. Infection Control programs can benefit from policy guidance and increased management attention. Definitive actions and timely correction of problems were not evident in the GAO study. Oversight and communication of long-standing infection control program requirements appeared to be deficient. As discussed in the DoD response to Recomendations 2 and 3, by May 1990, the Assistant Secretary of Defense (Health Affairs) will direct the Services to evaluate existing infection control program performance. The DoD will continue to pursue implementation of automated data processing through refinements in the Automated Quality of Care Evaluation Support System and installation of the Composite Health Care System, as discussed in the DoD response to Finding G. In addition, the DoD will continue to take advantage of patient care monitoring opportunities that exist in the Civilian External Peer Review Program, such as analysis of wound infection rates throughout Service medical treatment facilities.

The Joint Commission, mindful of the key role management holds in effecting a quality assurance program, has implemented Governing Body Standard GB.1.18, which states that, "The governing body provides for resources and support systems for the quality assurance functions and resource management functions related to patient care and safety." Those hospitals that demonstrate a failure to organize and manage a strong infection control program will be cited on surveys. The accountability of responsible commanders, as well as the effectiveness of Service and DoD policy, will be evaluated.

FINDING G: Hospital Management Did Not Allocate Adequate Resources to the Infection Control Program. The GAO found that infection control programs at six of the nine hospitals visited suffered because they had too few resources to carry out the program. The GAO reported that Air Force regulations require one full-time practitioner for each hospital with 125 or more operating beds. The GAO found that practitioners at two Air Force hopitals it visited were concerned they might not be able to meet infection control requirements because of a lack of staff. The GAO further found, however, that neither the Navy nor the Army has established infection control staffing requirements. In addition, the GAO found that a lack of resources hampered infection control at the Army and Navy hospitals it visited. As an example, the GAO reported that at one Navy hospital, no surveillance was performed for about one year--while one of two infection control practitioner positions was vacant.

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In addition, the GAO found that administrative support for infection control activities was a concern at six of the hospitals it visited. According to the GAO, only the Air Force regulations specifically direct the hospital commander to provide appropriate administrative support to accomplish infection control activities. The GAO found, however, that two of the Air Force hospitals it visited did not have any administrative support available to the infection control program.

The GAO observed that adding staff is not the only solution to the identified problems. The GAO found, for example, that at one Air Force hospital, a nurse was designated as liaison between the wards and practitioner--allowing the practitioner more time to concentrate on activities with the most impact. The GAO also observed that computer support is another method of decreasing the time practitioners spend on surveillance functions. According to the GAO, eight of the nine infection control programs at the hospitals visited had access to computers--but staff at seven of the hospitals lacked either training or software for analysis. The GAO concluded that the absence of adequate resources is another indication that hospital management does not emphasize infection control. The GAO further concluded that it is the responsibility of each Service to determine the priority that should be given to infection control programs and to assure that the resources assigned reflect that priority. The GAO also concluded that, in its view, infection control should be a high priority area--that hospital management should give their programs not only adequate resources, but also recognition in the form of public support for the principles of infection control and encouragement of infection control activities. (p. 5, p. 46, pp. 48-53, p. 56, GAO Draft Report)

Now on pp. 4, 30, 31-34, and 35.

DoD Response: Concur. It should be recognized, however, that quality patient care must be the number one priority. It is difficult in the real world of resource constraints to fully fund and staff all program requirements at all times. Maximum efficiency of existing resources is a goal. A DoD review of recent Service Joint Commission Survey findings suggests that infection control programs can benefit from enhanced oversight and attention to detail. In addition, the DoD is taking steps to improve infection control automation through enhancements in both the Automated Quality of Care Evaluation Support System and the Composite Health Care System.

FINDING H: Extent of Command Monitoring of Infection Control Programs. The GAO explained that the Services delegate responsibility for monitoring hospital infection control programs to their mid-level commands which, in turn, rely upon periodic visits by their staff and inspectors general to provide information about hospital programs. The GAO found, however that none of the mid-level commands visited required the hospitals to submit any information on their infection control programs. The GAO reported that Navy mid-level quality assurance staff visit hospitals regularly, but do not necessarily have expertise in infection control. The GAO found that Army and Air Force

mid-level commands review their hospitals' infection control programs only when requested by the hospital, and rely on Inspector General reports to identify weaknesses in infection control programs.

The GAO found that visits to a hospital by officials knowledgeable in infection control are beneficial. The GAO reported, for example, that at two hospitals visited there was evidence that the infection control program improved dramatically after discussions with Service consultants or after a visit by a knowledgeable mid-level official.

The GAO also reported that, from 1986 to early 1988, the Service Inspectors General had reviewed seven of the nine hospitals visited. The GAO found, however, that although five of the seven hospitals had problems complying with existing Service regulations, none of the Inspector General reports mentioned any infection control problems at these facilities. The GAO observed that this may be because (1) Inspector General teams do not include staff knowledgeable in infection control and (2) the guidance they follow is not specific enough to assess program effectiveness. The GAO pointed out that, when the Inspectors General do identify problems, their recommendations can have impact, as evidenced by a Navy review of infection control programs in its dental clinics. The GAO concluded that the Services should periodically visit hospitals to assure that (1) an appropriate level of resources has been allocated to infection control, (2) the program is supported throughout the hospital, and (3) the program is performing the appropriate activities.

The GAO further concluded that, by using both the staff assistance visits and Inspector General reviews, the Services should have more assurance that infection control programs are effective. (p. 5, p. 45, pp. 53-57, GAO Draft Report)

Now on pp. 4, 30, and 34 to 36.

DoD Response: Concur. The DoD agrees that official visits to hospitals by professionals with credentials in infection control and surveillance can be beneficial. The inspection process in Navy medical treatment facilities changed in October 1989 when the Bureau of Medicine and Surgery started a command inspection program. The inspection team can be augmented by an Environmental Health Officer and/or Preventive Medicine Officer. The eight mid-level regional geographic commands were dissolved as of October 1, 1989. Health Service Support Offices have been established. Each office has a Quality Assurance/Nurse billet. While the Quality Assurance officer may not have strict infection control background, he or she is an officer with significant prior quality assurance experience and training. There are no required assist visits.

The Air Force has identified infection control as an Inspector General Special Interest item. Infection control is routinely reviewed on Health Service Management inspections. The mid-level Staff Assist Group is capable of identifying deficiencies in an infection control program and has direct access to a clinical consultant at the major command level.

While the infection control consultant for each medical command is available for consultation, the Army does not have overall guidance that authorizes planned and systematic consultative visits. Joint Commission survey findings are monitored and a comprehensive checklist is updated annually, but Army inspections have become focused on selected system-wide problems, of which infection control may be a part. All the Services address infection control problems when deficiencies are found.

Review of Joint Commission survey findings is regularly conducted by the Services. However, the DoD agrees that, while the Inspector General Teams review infection control programs for the Services, there is neither Service guidance that requires regular evaluation of infection control programs, nor is there Service guidance for the provision of planned and systematic consultation and assistance. Accordingly, by May 1990, the Assistant Secretary of Defense (Health Affairs) will direct the Services to conduct planned and systematic reviews of infection control programs. (See also the DoD response to Recommendation 3)

RECOMMENDATIONS

Now on pp. 4-5 and 28.

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Service Secretaries, in conjunction with the Assistant Secretary of Defense for Health Affairs, to update Service infection control regulations--at a minimum, requiring the regulations to contain components similar to those in the GAO-developed basic elements. (p. 5, p. 44 GAO Draft Report)

DoD Response: Concur. By May 1990, the Assistant Secretary of Defense (Health Affairs) will require the Services to adopt infection control policies that are in compliance with current Joint Commission Standards and those of other nationally recognized experts as applicable. The GAO elements will be provided to facilities for their consideration and implementation, as appropriate. Service policies are to describe the level of support required for the maintenance of the program.

Now on pp. 5 and 36.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Service Secretaries, in conjunction with the Assistant Secretary of Defense for Health Affairs, to (1) require the Surgeons General to determine the relative priority of the infection control programs in relation to other hospital activities and (2) assure the hospitals provide adequate resources to infection control. (p. 5, p. 57 GAO Draft Report)

DOD Response: Concur. Infection prevention and control are priorities by virtue of the fact that they are essential elements of quality patient care. They are also a standard of the hospital accreditation process. In addition to the direction to adopt infection control practices as described in the DoD response to Recommendation 1, by May 1990 the Assistant Secretary of Defense (Health Affairs) will direct the Surgeons General to:

-- reemphasize the importance of infection control programs to quality patient outcomes, and

-- review infection control programs and assets, relative to resources, and take corrective action as appropriate.

In addition, the DoD will pursue refinement and implementation of automated support systems.

Now on pp. 5 and 37.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense direct the Service Secretaries, in conjunction with the Assistant Secretary of Defense for Health Affairs, to assure that headquarters or mid-level command staff, who are familiar with infection control program activities, make periodic visits to each hospital to provide technical assistance to the infection control program. (p. 5, p. 57 GAO Draft Report)

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DoD Response: Concur. By May 1990, the Assistant Secretary of Defense (Health Affairs) will further direct the Services to provide for both technical assistance and regular evaluation of the full scope of infection control programs. This will include targeting of technical assistance and periodic evaluation of hospitals, as appropriate.

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