Department of Veterans Affairs

Office of Inspector General

EVALUATION OF VETERANS HEALTH ADMINISTRATION RADIOLOGY AND NUCLEAR MEDICINE ACTIVITIES

> *VHA diagnostic radiology and nuclear medicine activities require: standardized workload reporting and staffing guidelines; coordination in acquiring new technology; and greater oversight and direction.*

Report No. 9R4-A02-133
Date: July 23, 1999

Office of Inspector General
Washington DC 20420

Memorandum to the Under Secretary for Health (10)

**Evaluation of Veterans Health Administration
Radiology and Nuclear Medicine Activities**

1.   The Office of Inspector General conducted an evaluation of the Veterans Health Administration's (VHA) Radiology and Nuclear Medicine Activities. The purpose of this evaluation was to review program operations and to identify any significant weaknesses or problems. This program had expenses of over $460 million in Fiscal Year (FY) 1996. Included in the FY 1996 costs, VHA had a total of 4,757 full-time, 479 part-time, and 748 intermittent radiology and nuclear medicine employees with salary expenses of about $198.8 million. The FY 1996 cost for the services of radiology and nuclear medicine physician residents was about $11 million, and $54.3 million was spent on scarce medical specialist, institutional, and individual contracts. Major diagnostic equipment purchased through the Department of Veterans Affairs (VA) National Acquisition Center for radiology and nuclear medicine totaled about $123 million, in that same year. The balance of the $460 million was spent on other operating expenses and consumables.

2.   As a part of our evaluation, we sent a questionnaire to 167 VA medical facilities. We received responses covering 166 facilities which indicate that selected aspects of the Radiology and Nuclear Medicine Programs were generally operating satisfactorily. The radiology and nuclear medicine services were appropriately accredited and all medical centers reported that mammography services are offered to women veterans, either by in-house staff or on contract.

3.   Management improvements were needed. Management information reports for radiology and nuclear medicine activities were inconsistent and could not be used to compare the productivity of medical centers. The questionnaire results showed a wide variation in how workload was counted and reported. Most radiology and nuclear medicine services did not use staffing guidelines, and there was a wide variety among those guidelines that were used. We noted that there were large differences in staffing levels of some medical centers with ostensibly comparable radiology and nuclear medicine workloads. Our review also found a lack of coordination among medical centers and Veterans Integrated Service Networks (VISNs) in acquiring "picture archiving and communication systems" (PACS), which could have significant fiscal

repercussions. Officials of the Diagnostic Services Strategic Healthcare Group expressed their concerns about facilities acquiring PACS equipment without adequate consultation or coordination with other VISNs and medical centers. They feared that this could result in the acquisition of PACS that were not tailored to the medical centers' needs and which were incompatible with other medical centers' systems. Based on responses to our questionnaire, at least $114 million in equipment expenditures over the next 5 years are vulnerable to being mis-spent. This is because facilities are not determining compatibility of planned equipment and/or are not performing cost/benefit analyses.

4.   Radiology Service needs a Program Director, a position that has been vacant since September 1996. Radiology, Nuclear Medicine, and Laboratory Services comprise the Diagnostic Services Strategic Healthcare Group. This group is headed by a Chief Consultant who presides over VHA Headquarters staff representing each of the three services. Nuclear Medicine and Laboratory Services both have Directors. Our findings of lack of consistency in workload reporting and staffing, as well as the need for better coordination for the acquisition of new technology, all point to the need for management direction in the Radiology Program. In addition, we were told that many Radiology Service Chiefs feel that they are under represented in Headquarters and, in response to our questionnaire, Radiology Service Chiefs said they would like additional guidance in at least seven different areas.

5.   We recommended that: i) management information reports and workload counting be made consistent; ii) guidance be provided on the use of appropriate staffing guidelines; iii) guidance be provided on the acquisition of PACS equipment to assure need and compatibility; and iv) a Director of Radiology Service be appointed.

6.   The Under Secretary for Health stated concurrence with our findings and recommendations, and provided acceptable implementation plans. He also generally concurred with our estimate of funds that might be at risk. Therefore, we consider all issues in this report resolved, although we will continue to follow up on all planned actions until completion.

For the Assistant Inspector General for Auditing

(Original signed by:)

WILLIAM V. DEPROSPERO
Director, Chicago Audit Operations Division

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RESULTS AND RECOMMENDATIONS

Our evaluation found that selected aspects of the Veterans Health Administration (VHA) Radiology and Nuclear Medicine Programs were generally operating satisfactorily. However, there is need for improvement in these programs in four areas: i) workload reporting; ii) evaluation of staffing levels; iii) new technology acquisition; and iv) overall direction. In Fiscal Year 1996, these programs had operating expenses of over $460 million.

1. Reliable, Uniform Workload Reporting Is Needed for Radiology and Nuclear Medicine Services

The Automated Management Information System (AMIS) report for radiology services is incomplete and unreliable. New procedures, such as magnetic resonance imaging (MRI), are not included in the report. In response to the inadequacies of AMIS, nuclear medicine program officials have requested that each service include detailed workload information in its annual report as an alternative to AMIS.

Our questionnaire sent to 152 medical facilities in VHA showed that there is a wide variation in methods of counting workload using the Veterans Health Information Systems and Technology Architecture (VISTA) radiology/nuclear medicine software package. For example, in response to our questionnaire sent to 152 medical centers, half (76) of the Radiology Services counted procedures without a verified report; 53 counted procedures that were interpreted by their radiologist staff but performed by another facility; and 67 counted procedures more than once if they involved multiple sessions, sites, or activities.

Each Veterans Integrated Service Network (VISN) and medical center now has considerable discretion in recording and counting workload. The VISTA software package allows each facility to determine when procedures are counted in workload reports. Staff at some facilities also reported making other in-house changes to the VISTA reports, tailoring the reports to their specific needs. Another variable in counting workload is the way in which medical center staff use Current Procedural Terminology (CPT) codes. The lack of uniformity in using CPT codes can result in significant reporting differences between medical centers with comparable workloads.

The lack of consistent, objective workload and reporting standards can adversely affect the reliability of performance measures. Without a standardized method for measuring and reporting radiology and nuclear medicine workload, it is very difficult to compare the productivity of different medical centers and VISNs, and to do system-wide planning.

For More Information

- *Detailed findings on workload reporting can be found in Appendix III.*

Recommendation 1

The Under Secretary for Health should establish a uniform workload reporting mechanism for Radiology and Nuclear Medicine Services.

Under Secretary for Health Comment

Concur. (The full text of the Under Secretary's comments and implementation plans is contained in Appendix X.)

Office of Inspector General Comment

The Under Secretary's comments and implementation plans are responsive to this recommendation and we consider this issue resolved, although we will continue to follow up on all planned actions until completion.

2. **Staffing Guidelines Are Needed for Radiology and Nuclear Medicine Services**

Our evaluation found that not all radiology and nuclear medicine services used staffing guidelines, and that there were significant variances between those guidelines that were used.

About 34 percent of separate Radiology and combined Radiology and Nuclear Medicine Services and 29 percent of separate Nuclear Medicine Services reported using guidelines to determine appropriate staffing levels. A variety of guidelines were reported. For instance, the guidelines used for physician radiologists ranged from 1 for every 5,000 procedures to 1 for every 17,600 procedures per year. The range for radiology technologists was from 1 for every 2,000 procedures to 1 for every 6,600 procedures per year. Respondents reported a total of 10 different sources for radiologist staffing guidelines and 10 different sources for radiology technologist staffing guidelines.

Based on the results of our questionnaire, we found that there was not a clear correlation between workload and staffing levels. Medical center staffing was based on various staffing guidelines, historical patterns, professional experience, and the medical center staff's estimate of the number of staff needed based on waiting times and minimum staff levels. In most instances, staffing determinations were made at the medical center level.

When we grouped medical centers according to the size of their reported workloads and compared staffing levels, we found that there were frequently large variances in staffing levels among medical centers of comparable workloads. For example, for medical centers with workloads of 20,001 to 30,000 annual procedures, the number of technologists ranged from a low of 5 full-time equivalent employees (FTEE) to a high of 36 FTEE. For that same workload interval, the number of radiologists ranged from a low of 1.0 FTEE to a high of 7.8 FTEE.

This wide disparity in staffing levels is the result of the absence of staffing guidelines at the national or, in most cases, at the VISN level. It is also likely that the lack of consistent objective workload measurement contributes to this disparity. Radiology and nuclear medicine service staffing guidelines would assist managers in making appropriate staffing decisions.

For More Information

- *Detailed findings on staffing guidelines can be found in Appendix IV.*

Recommendation 2

The Under Secretary for Health should take action to standardize staffing guidelines for Radiology and Nuclear Medicine Services.

<u>Under Secretary for Health Comment</u>

Concur. (The full text of the Under Secretary's comments and implementation plans is contained in Appendix X.)

<u>Office of Inspector General Comment</u>

The Under Secretary's comments and implementation plans are responsive to this recommendation and we consider this issue resolved, although we will continue to follow up on all planned actions until completion.

3.   More Coordination and Direction Is Needed for the Acquisition of PACS and Teleradiology Equipment

During the evaluation, program officials expressed concern that medical centers were acquiring "picture archiving and communications systems" (PACS) without adequately considering the size or type of system that would best meet their specific needs. Another area that was not being considered was compatibility with other Department of Veterans Affairs (VA) medical centers and affiliated facilities. The results of our questionnaire validated these concerns.

Over half (79) of the facilities responding to the questionnaire have plans to acquire a PACS capability within the next 5 years. Forty-four of those medical centers provided cost estimates with an average cost of about $1.9 million for PACS. Only 29 (37 percent) of the medical centers reported that they consulted, or planned to consult, other VA facilities or VISNS to determine the capability and capacity of the PACS equipment needed and its compatibility with other systems. Only 19 (24 percent) of the medical centers reported having performed a cost/benefit analysis.

Failure to coordinate and to perform analyses of what is needed could result in excessive costs, and in systems that are incompatible with those of other facilities, including medical school affiliates, Department of Defense (DoD) medical centers, and the Tricare Program.[1]   Based on the average cost of $1.9 million each, 79 sites will spend about $150 million to acquire PACS in the next 5 years. Failure to coordinate with other medical centers and VISNs or to perform detailed analyses to determine what is needed could result in the acquisition of PACS equipment that is too costly and is in excess of a facility's needs and/or incompatible with other facilities.

Such failure to adequately plan could also result in a fragmented VA-wide imaging system in which medical centers will not be able to send medical images to each other or to DoD and affiliated medical school facilities (*i.e.*, teleradiology). Thus, continuity of patient care could be disrupted when a veteran travels from one VA medical center to another. Also, it could affect support to the Veterans Benefits Administration(VBA), as VBA enhances its capability to electronically access medical records for use in processing disability claims.

Based on responses to the questionnaire, if only 24 percent and of the sites that plan to acquire PACS do cost/benefit analyses and only 37 percent insure that they obtain compatible systems, the balance of the sites risk mis-spending $1.9 million each. That would be $114 million for the 60 sites that do not do cost/benefit analyses, and

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[1] Tricare is the DoD's managed health care plan. VA medical centers are eligible to be reimbursed for care under this program, but must first apply through managed care support contractors to become Tricare providers.

$95 million for the 50 sites that do not insure compatibility within and outside of the VA system.

Therefore, cost/benefit analyses based upon justification of need and a determination of compatibility should be accomplished before any PACS purchases are made.

For More Information

- *Detailed findings on the acquisition of PACS and teleradiology equipment can be found in Appendix V.*

Recommendation 3

The Under Secretary for Health should:

a.   Prescribe a compatibility standard for PACS and teleradiology equipment.

b.   Require that medical centers perform cost/benefit analyses before acquiring PACS and teleradiology equipment.

The associated monetary impact for this recommendation is shown in Appendix XI.

Under Secretary for Health Comment

Concur. (The full text of the Under Secretary's comments and implementation plans is contained in Appendix X.)

Office of Inspector General Comment

The Under Secretary's comments and implementation plans are responsive to this recommendation and we consider this issue resolved, although we will continue to follow up on all planned actions until completion.

4. Radiology Service Should Have a Program Director

In the VHA organization, Radiology and Nuclear Medicine Services, along with Laboratory Service, make up the Diagnostic Services Strategic Healthcare Group (SHG). This group is headed by a Chief Consultant who presides over SHG staff (not necessarily located in VHA Headquarters) representing each of the three services.

At the time of our review, Radiology Service was not represented at this level. While both Laboratory and Nuclear Medicine Services had their Program Director positions filled by physicians, as well as support staff, Radiology program staff consisted of only two people who dealt solely with the mammography program. Another non-physician position (Chief of Technology Division), located directly under the Chief Consultant, is devoted to radiology.

Because of this situation, we learned that many of the field Radiology Service Chiefs feel that their voices are not heard in VHA Headquarters. As a result, they have formed a group called the Radiology Field Council, which consists of 12 Service Chiefs from the field and the Chief Consultant for the Diagnostic Services SHG. The purpose of the group is to advise the Chief Consultant on areas that are of concern to field Radiology Service staff.

The Radiology Chiefs, in response to the questionnaire, said that they could benefit from Headquarters guidance in seven different areas, including PACS/teleradiology, CPT coding, equipment planning and acquisition, staffing guidelines, critical pathways, organization guidelines, information sharing, and consultations.

In addition, the conditions discussed earlier in this report are evidence of the need for program direction. Reliable, consistent workload reporting is needed. Uniform methods to evaluate staffing are needed. More coordination and direction is needed in the area of acquisition of new technology.

The Radiology Program Director's position has been vacant since September 1996. We believe that the Diagnostic Radiology Program, which consumes a great amount of resources and is in the midst of a major change in technology, should be represented at the Headquarters level.

Recommendation 4

The Under Secretary for Health should appoint a physician to fill the Program Director for Radiology Service position to provide guidance for field facilities in the form of standards and protocols.

<u>Under Secretary for Health Comment</u>

Concur. (The full text of the Under Secretary's comments and implementation plans is contained in Appendix X.)

<u>Office of Inspector General Comment</u>

The Under Secretary's comments and implementation plans are responsive to this recommendation and we consider this issue resolved, although we will continue to follow up on all planned actions until completion.

MANAGEMENT ADVISORY

Additional issues came to our attention which we did not evaluate. Therefore, we are providing the following items, identified from our nationwide questionnaire, that we believe warrant the attention of radiology and nuclear medicine management. The percentages cited are based on 152 respondents for separate Radiology and combined Radiology/Nuclear Medicine Services, and 58 respondents for separate Nuclear Medicine Services.

1) 33 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they do not use "practice guidelines" or protocols for magnetic resonance imaging, computer tomography, or angiogram procedures. (Question 26)[2]

2) a. 10 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they do not perform corrective action on identified quality assurance problems. (Question 31)

   b. 9 percent of separate Nuclear Medicine Services reported that they do not perform corrective action on identified quality assurance problems. (Question 158)

3) a. 14 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they do not have performance measures for diagnostic imaging activities. (Question 34)

   b. 16 percent of separate Nuclear Medicine Services reported that they do not use performance measures for diagnostic imaging activities. (Question 161)

4) a. 27 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they do not prepare any reports on the accomplishment of performance measures. (Question 36)

   b. 26 percent of separate Nuclear Medicine Services reported that they do not prepare any reports on the accomplishment of performance measures. (Question 163)

5) a. 82 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that their prime source of information on equipment is vendors. (Question 43)

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[2] Question numbers relate to the full questionnaire and results found in Appendices VII and VIII.

b.   72 percent of separate Nuclear Medicine Services reported that their prime source of information on equipment is vendors. (Question 170)

6)   a.   88 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that utilization guidelines are not used when evaluating the need for new or replacement equipment. (Question 47)

b.   66 percent of separate Nuclear Medicine Services reported that utilization guidelines are not used when evaluating the need for new or replacement equipment. (Question 174)

7)   a.   49 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they had not performed a cost/benefit analysis for planned teleradiology capabilities. (Question 55)

b.   33 percent of separate Nuclear Medicine Services reported that they had not performed a cost/benefit analysis for planned telenuclear medicine capabilities. (Question 182)

8)   a.   13 percent of combined Radiology/Nuclear Medicine Services reported that they did not know if the planned system would meet ACR NEMA DICOM[3] standards. (Question 56)

b.   5 percent of separate Nuclear Medicine Services reported that they did not know if the planned system would meet ACR NEMA DICOM standards; another 3 percent reported that the planned system would not meet these standards. (Question 183)

9)   a.   37 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they had not performed a cost/benefit analysis for planned PACS capabilities. (Question 64)

b.   26 percent of separate Nuclear Medicine Services reported that they had not performed a cost/benefit analysis for planned PACS capabilities; another 2 percent did not know if one had been performed. (Question 191)

10)   a.   31 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they did not verify management reports. (Question 75)

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[3] ACR – American College of Radiology; NEMA – National Electrical Manufacturers Association; DICOM – Digital Imaging and Communications in Medicine.

b.	40 percent of separate Nuclear Medicine Services reported that they did not verify management reports. (Question 202)

11)	a.	45 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they have workload backlogs in one or more areas. (Questions 81-82)

b.	45 percent of separate Nuclear Medicine Services reported that they have workload backlogs in one or more areas. (Questions 208-209)

12)	a.	24 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they have excess capacity in one or more areas. (Question 84)

b.	21 percent of separate Nuclear Medicine Services reported that they have excess capacity in one or more areas. (Question 211)

13)	a.	16 percent of Radiology and combined Radiology/Nuclear Medicine Services reported that they have cut services because of loss of staff due to budget cuts. (Question 89)

b.	9 percent of separate Nuclear Medicine Services reported that they have cut services because of loss of staff due to budget cuts. (Question 216)

14)	a.	30 percent of separate Nuclear Medicine Services (or their facilities) do not receive compensation or reimbursement for services provided to other VA facilities. (Question 92)

b.	41 percent of separate Nuclear Medicine Services (or their facilities) do not receive compensation or reimbursement for services provided to other VA facilities. (Question 220)

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OBJECTIVES, SCOPE, AND METHODOLOGY

Objectives

The purpose of this evaluation was to review the Radiology and Nuclear Medicine Programs of VHA and to identify significant weaknesses or problems.

Scope and Methodology

The scope of our evaluation included the following activities:

Accreditation and Inspections	Management Information Systems
Acquisition of New Technology	Performance Measures
Contracts	Quality Assurance
Equipment	Radiation Safety
Mammography Program	Workload and Staffing

To accomplish our objectives we reviewed prior audit reports, as well as financial, workload, and staffing data. We interviewed radiology and nuclear medicine program officials at VA Medical Center Ann Arbor, MI. We visited VHA Headquarters and talked with officials in the areas of Diagnostic Services, Patient Care, Medical Sharing, Quality Assurance, and Women's Programs. We also contacted non-VA imaging organizations, PACS equipment manufacturers, and DoD imaging and Tricare officials for information on productivity, performance, imaging equipment compatibility, and interdepartmental cooperation.

We interviewed imaging officials at VA Hospital Hines, IL and visited medical centers at Ann Arbor, MI, Baltimore, MD and Chillicothe, OH. Ann Arbor is the location of the Acting Chief Consultant of VHA's Diagnostic Services Strategic Healthcare Group. We selected Baltimore because it had a complete and fully operational PACS. We selected Chillicothe because, in contrast to Baltimore, it did not have the latest, state-of-the-art technology, and also had significant contracting costs.

To acquire a nationwide perspective of VA's Radiology and Nuclear Medicine Programs, we sent a comprehensive questionnaire to each of the medical centers in VHA. For purposes of that questionnaire, we divided respondents to our questionnaire into two categories:

Group I – Radiology Services alone and Radiology Services combined with Nuclear Medicine Services, often referred to as "Imaging Services."

Group II – Separate Nuclear Medicine Services.

This evaluation was performed in accordance with VA Office of Inspector General policy for evaluations, including compliance with the following Government Auditing Standards, issued by the Comptroller General of the United States:

- General standards (Chapter 3) for quality, independence, and due professional care

- Field work standards for performance audits (Chapter 6) for planning, supervision and evidence

- Reporting standards for performance audits

BACKGROUND

The mission of Radiology and Nuclear Medicine Services is to provide high quality diagnostic care to patients consistent with available staff and equipment. Radiology uses radiant energy in the diagnosis of ailments; nuclear medicine uses isotopic preparations injected into the patient to make diagnoses.

For Fiscal Year (FY) 1996, VHA reported a total of 4,119 full-time, 401 part-time, and 719 intermittent radiology employees with an annual salary of about $166.5 million. Nuclear medicine had 638 full-time, 78 part-time, and 29 intermittent employees with an annual salary of about $32.3 million.

Staffing for both services declined from FY 1994 to FY 1996. Radiology full-time employees decreased by 4 percent and part-time employees decreased by 17 percent. Nuclear medicine full-time employees decreased by 10 percent and part-time employees decreased by 22 percent. The steeper decline for nuclear medicine is attributable, at least in part, to the merging of the two services at some medical centers. Financial data showed that the cost for diagnostic radiology and nuclear medicine physician residents declined from $13.3 million in FY 1994 to about $11 million in FY 1996.

VHA also contracts for the services of additional physicians and technologists through scarce medical specialist (SMS), institutional, individual, and sharing agreement contracts. Our review of financial data for FY 1994 to FY 1996 provided the following breakdown of contract costs:

	FY 1994	**FY 1995**	**FY 1996**
SMS Contracts	$27.1 million	$27.2 million	$29.2 million
Total Contracts	$54.8 million	$55.4 million	$54.3 million

Major diagnostic equipment purchased through VA's National Acquisition Center for both radiology and nuclear medicine increased from $89 million in FY 1994 to $123 million in FY 1996, a 39 percent increase. However, the increase from FY 1995 to FY 1996 was only 5 percent. Thus, VA radiology and nuclear medicine activities consumed over $376 million in resources for personnel, contracts, and equipment in FY 1996. Total costs for radiology and nuclear medicine activities during FY 1996 were $460 million, according to VA's data in the Financial Management System.

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DETAILS OF FINDINGS

A Standardized Method for
Counting and Reporting Radiology and Nuclear Medicine Workload
Would Allow Productivity Comparisons Among Facilities

We found that imaging workload is being measured in different ways at different medical centers. As a result, it is not possible to make meaningful comparisons between different medical centers' productivity.

In responses to our survey questionnaire, we found many examples of inconsistency throughout the VA system in reporting imaging workload. Our survey results are divided into two groups:

> Group I – Responses from separate Radiology Services and combined Radiology and Nuclear Medicine Services (often referred to as "Imaging Services"). (Appendix VII)
>
> Group II – Responses from separate Nuclear Medicine Services. (Appendix VIII)

Of 152 Group I respondents, one-half (76) counted as workload imaging procedures performed, but for which there was no verified report of the procedure. In contrast, the other half of Group I respondents told us that they did not count such procedures as reportable workload until there was a verified report.

Of the same 152 Group I respondents, 35 told us that they counted as reportable workload procedures performed by their own staff, but interpreted by staff of another facility. However, the remaining 117 respondents said that they did not count procedures interpreted at another facility.

When a procedure involved multiple sessions, sites, or other activities, 67 of 152 Group I respondents told us that they counted that procedure more than once as reportable workload. The remaining 85 respondents counted procedures with multiple aspects only once. Among Group II respondents, there was a similar situation. Twenty-seven of 58 Nuclear Medicine Services counted procedures with multiple aspects more than once, while the remaining 31 did not.

Thus, trying to make meaningful comparisons between various VA imaging activities was not possible.

Another area of workload reporting that is highly variable is Current Procedural Terminology (CPT) coding. CPT codes, established by the American Medical

Association, are used to represent various outpatient procedures, including imaging procedures. However, reporting by use of CPT codes is not a simple one-for-one process.

Respondents to our questionnaire and other imaging staff interviewed told us that whether a medical center got full credit for the workload it performs, depends on the skill of medical center staff involved with reporting by CPT codes. Specifically, each medical center has an applications coordinator (ADPAC) who programs the workload reporting system with the appropriate CPT codes. It is the responsibility of the ADPAC to know which codes are applicable to the procedures performed at the medical center, to insert those codes into the reporting software, and to make them available for use. However, we were told that some ADPACs may be more or less knowledgeable than others as to which codes are applicable to the procedures performed at their medical centers. An ADPAC must also ensure that the software automatically records all codes related to a complicated procedure.

VHA Headquarters officials stated that some facilities also used "modifier" codes, which were not included in CPT codes provided to the field. This results in several codes for the same procedure. The use of modifiers creates multiple codes for a procedure (anesthesia, incision, actual test, etc.) and causes more workload to be reported.

We found that the Veterans Health Information Systems and Technology Architecture (VISTA) radiology/nuclear medicine software package did not produce information that could be used to compare the operations of medical centers either nationally or within a Veterans Integrated Service Network (VISN). The amount of workload credit a medical center received varied with the requirements established at that medical center and the CPT coding expertise of the ADPAC.

Conclusion

There is no standardized method for counting and reporting workload for radiology and nuclear medicine activities. A standardized workload counting and reporting methodology is needed so that efficiency and productivity can be evaluated to assist in making management decisions.

DETAILS OF FINDINGS

A Standardized Method for
Evaluating Radiology and Nuclear Medicine Staffing Levels
Would Enhance Management of Resources

Our evaluation found that not all imaging services use staffing guidelines and that there are significant variances between those guidelines that are used.

In responses to our survey questionnaire, we found many examples of inconsistency throughout the VA system in reporting imaging workload. Our survey results are divided into two groups:

> Group I – Responses from separate Radiology Services and combined Radiology and Nuclear Medicine Services (often referred to as "Imaging Services"). (Appendix VII)

> Group II – Responses from separate Nuclear Medicine Services. (Appendix VIII)

This was further illustrated by our review of staffing and the methods used to determine optimal staffing levels.

The results of our evaluation follow.

Staffing Determinations for Group I: Radiology and Combined Radiology and Nuclear Medicine Services

Guidelines Used for Determining Staffing Levels - Our survey disclosed a wide variety of methods used by medical centers to determine staffing levels for diagnostic imaging activities. Fifty-one of the 52 radiology and combined radiology and nuclear medicine services used staffing guidelines for radiologists and/or technologists. Respondents to our questionnaire cited 10 different sources for radiologist staffing guidelines and 10 different sources for radiology technologist staffing guidelines.

Source of Guideline	No. of Services
Radiologists	
American College of Radiology	12
Under Secretary for Health Information Letter (IL) 10-93-009: Scarce Medical Services Contracts - Report of Task Force on Staffing/Workload Guidelines for Anesthesiologists and Radiologists	3
VHA Directive 10-94-087: Scarce Medical Services Contracts: Staffing/Workload guidelines for Anesthesiologists and Radiologists .	9
Headquarters	2
VISN	2
Journal Article	1
Community Standard	1
Peat Marwick Consulting	1
American Healthcare Radiologist Association (AHRA)	1
Local	1
Technologists	
AHRA	17
Decentralized Hospital Computer Program	3
VISN	3
Radiology Service Productivity Standards	1
Radiology Service Management	1
Managed Care	1
Kaiser Permanente	1
American Registry of Radiologic Technologists	1
Comparable Hospitals	1
Local	1

Radiologist Guidelines - The American College of Radiology (ACR) conducted national surveys showing that the average productivity for a radiologist was 11,100 procedures per year for general radiology and 7,800 procedures per year for teaching hospitals. The range of guidelines reported by medical centers that used the ACR survey was from one radiologist per 7,800 procedures per year to one radiologist per 12,000 procedures per year.

The Under Secretary for Health's Information Letter 10-93-009, dated March 25, 1993, offers guidelines for determining contract diagnostic radiologist staffing needs. For general diagnostic x-ray, it suggests a range of 5,000-8,000 procedures per full-time equivalent employee (FTEE) per year for an affiliated medical center, and 10,000-13,000 for an unaffiliated medical center. Ranges for computerized tomography (CT), ultrasound, magnetic resonance imaging (MRI), and interventional procedures were also established. These are the same guidelines as VHA Directive 10-94-087, except that the Directive has no guideline for general diagnostic, affiliated sites.

In addition, other medical centers responding to the questionnaire reported using guidelines ranging from 1 radiologist per 5,000 procedures per year to 1 radiologist per 17,687 procedures per year.

Technologist Guidelines - The American Healthcare Radiologist Association (AHRA) published its latest survey for technologists in 1996. The average staffing that they found was one technologist for 2,859 procedures per year for general diagnostic procedures. The range of guidelines reported by those using AHRA as a guide was from one technologist for 2,000 procedures to one technologist for 2,924 procedures.

One medical center responded that based its staffing on a guideline reportedly established by Kaiser Permanente of 15 procedures per technologist per day, or 1 technologist for about 3,300 procedures per year, based on a 220-day work year.

Another medical center reported using an American Registry of Radiologic Technologists (ARRT) guideline of 150 procedures per technologist per week. Based on a 44-week work year, this would equate to one technologist for approximately 6,600 procedures per year. In contrast, medical centers using community standards or comparable hospitals reported using guidelines that ranged from one technologist per 2,000 procedures to one technologist per 3,900 procedures per year.

Comparison of Staffing Levels to Guidelines - When we compared technologist staffing guidelines reportedly used at various medical centers with the reported staffing levels of those medical centers, we found that many of the staffing levels did not conform to the guides that the medical centers reported using. One medical center had 35.6 FTEE technologists, but according to the guideline they reported using, their workload justified

only 25.4 FTEE. Another medical center had 24 FTEE technologists versus only 12.85 FTEE that their guideline called for.

A similar situation existed for radiologist staffing. For example, one medical center had 10.6 FTEE radiologists, while the guideline reportedly used called for only 6.5 FTEE. Another medical center had 11.9 FTEE radiologists, while their reported guideline called for only 4.9 FTEE. It should be noted that there were also other facilities whose imaging services appeared under staffed, according to the guidelines they reported using.

Other Methods Used to Determine Staffing Levels - A total of 101 of the separate radiology and combined radiology and nuclear medicine services reported that they did not use surveys or guidelines to determine staffing levels. They reported using a variety of methods, and several facilities reported using more than one method. The most frequently cited methods are shown below:

Method Used To Determine Staffing Requirements	Number of Services
Workload and cost analysis	54
Full coverage	13
Historical pattern	10
Professional experience	10
Waiting times and turnaround times	8
Minimum staff level	7
Patient care and satisfaction	5

Comparison of Staffing Levels for Comparable Workloads - We compared the reported staffing levels of imaging services that reported comparable workloads. This comparison also revealed some out-of-line situations. For medical centers with reported workloads in the 20,001 to 30,000 procedure range, the highest had 36 FTEE technologists, while the next highest facility had only 11 FTEE technologists. For medical centers in the 60,001 to 70,000 procedure range, the number of radiologists varied from 4.9 FTEE to 13.1 FTEE and the number of technologists ranged from 20 FTEE to 39 FTEE.

The seven facilities in this group averaged 8.9 radiologists and 28.6 technologists. A comparison of all the radiology activities (Group I, less any nuclear medicine workload and staffing) within their respective workload ranges in procedures is shown below.

Number of Services*	Procedures	Physician FTEE		Technologist FTEE	
		Range	Average	Range	Average
16	0 — 10,000	0 — 2.0	0.7	1.0 — 6.0	3.1
25	10,001 — 20,000	0 — 3.0	1.5	2.0 – 13.0	6.1
21	20,001 — 30,000	1.0 — 7.8	2.7	5.0 – 36.0	9.7
18	30,001 — 40,000	2.0 — 6.9	4.3	10.0 – 24.0	16.6
15	40,001 — 50,000	3.0 — 9.2	6.3	13.5 – 30.0	21.5
11	50,001 — 60,000	4.0 — 9.9	6.4	18.0 – 38.0	25.4
14	60,001 — 70,000	4.9 – 13.1	8.9	20.0 – 39.0	28.6
9	70,001 — 80,000	5.8 – 11.9	8.4	21.0 – 35.6	29.4
3	80,001 — 90,000	6.4 – 10.4	8.9	26.4 – 39.5	31.8
3	90,001 – 100,000	8.4 – 12.0	10.8	31.0 – 54.4	40.8
3	100,001 +	6.0 – 15.0	11.5	25.6 – 54.0	41.2

*Thirteen respondents were excluded from this analysis. The number of physician FTEE could not be determined for 12 services, and 1 was excluded because its workload was reported in "weighted workload units."

Staffing Guidelines for Group II: Separate Nuclear Medicine Services

Guidelines Used for Determining Staffing Levels - Seven of the fifty-eight separate Nuclear Medicine Services used staffing guidelines for physicians, and seventeen used guidelines for technologists.   The guidelines are shown below.

Reported Source of Guideline   **Guideline: One FTEE Per-**

Physician

Radiology Management, Fall 1993 (a journal article) .... 5,999 procedures/year

American College of Nuclear Physicians (ACNP) .... 1,000+ procedures/year

ACNP Nuclear Facility Report - 1988 [WD1]............................... 2,000 procedures/year

VISN .... Facility

Technologist

American Healthcare Radiologist Association .... 890 procedures/year

VHA Headquarters Program Officials .... 900 procedures/year

Local .... 1,000 procedures/year

VA Nuclear Medicine Annual Report .... 1,200 procedures/year

American College of Nuclear Medicine .... 1,250 procedures/year

VA Standards .... 880 procedures/year

Local .... 880 procedures/year

VISN .... Camera

(Local .... Costs of local services)

Other methods Used to Determine Staffing Levels – The 41 separate Nuclear Medicine Service respondents that did not use staffing guidelines reported that they used the methods illustrated below to determine staffing levels.

Method Used To Determine Staffing Requirements	Number of Services
Workload analysis	26
Minimum staff level	7
Professional experience	5
Comparable hospitals	4
Historical pattern	3
Timeliness	2
Patient needs	2
24-hour coverage	1
No backlogs	1

Comparison of Staffing Levels for Facilities with Comparable Workload - Staffing for the 58 separate Nuclear Medicine Services is shown below, grouped according to workload ranges.

Number of Services	Workload Range	Physician FTEE		Technologist FTEE	
		Range	Average	Range	Average
5	0 – 1,000	0 – 1.0	0.4	1.0 — 3.0	1.5
14	1,001 – 2,000	0 – 2.5	1.0	1.5 — 6.3	3.1
15	2,001 – 3,000	8 – 4.0	1.5	3.0 — 7.0	4.6
10	3,001 – 4,000	5 – 2.9	1.7	2.0 — 8.9	4.7
5	4,001 – 5,000	0 – 4.3	1.9	4.0 – 14.8	7.0
7	5,001+	1 – 3.1	2.1	3.0 – 12.0	6.5

Among the disparities noted: one facility had 14.8 FTEE technologists while the average for its workload range was 7.0 FTEE; and another had 4.3 FTEE physicians compared to the average of 1.9 FTEE.

Conclusion

There is no standardized method for counting and reporting workload for radiology and nuclear medicine activities. In addition, staffing varies greatly among medical centers with <u>reportedly</u> similar workloads. Also, no consistent staffing guidelines are used, and the guidelines that are reportedly used are apparently ignored in many cases. Thus, consistency in workload counting and reporting is needed. Based on that, standard guidelines should be established for staffing of physicians and technologists in radiology and nuclear medicine activities.

DETAILS OF FINDINGS

Coordination of PACS and Teleradiology Purchases at the Headquarters Level Would Help Ensure That VHA Imaging Systems Are Compatible and Cost Efficient

Program and imaging service officials at VA Medical Centers Ann Arbor and Baltimore expressed concern that staff at medical centers throughout VHA may be purchasing "picture archiving and communication systems" (PACS) and teleradiology equipment without adequately considering factors such as interfacing and compatibility with equipment at other facilities. According to these officials, all networks are planning to acquire PACS. However, VHA has no system-wide strategy for obtaining and using PACS. Decision making for acquiring high technology has been decentralized to the VISN level. If VISN Directors do not consider whether their systems are compatible with other VISNs' systems, there is the potential risk of a huge investment in incompatible systems.

The responses to our radiology and nuclear medicine questionnaire support these concerns. Seventy-nine (52 percent) of the medical centers had plans to acquire PACS within the next 5 years. Of the 43 facilities that submitted cost estimates, the average cost for acquiring PACS was $1.9 million per facility. In deciding on the capability of the PACS equipment needed, staff of only 29 medical centers (37 percent) stated that they had or planned to consult other VA facilities or VISNs; and only 19 (24 percent) had done a cost/benefit analysis.

Lack of adequate planning and analysis in acquiring PACS could mean that funds could be mis-spent. If only 29 of the 79 VA medical centers planning to acquire PACS have consulted other medical centers or VISN staff regarding compatibility, the remaining 50 may mis-spend $95 million ($1.9 million x 50). Likewise, if only 19 medical centers have done a cost/benefit analysis, the remaining 60 medical centers could mis-spend $114 million ($1.9 million x 60).

Thus, between $95 million and $114 million in VA resources could be at risk, because acquisition of PACS is not subject to any coordinated, cost effective standards.

One of the main areas of concern for VA officials is the standard used to interface between the PACS and the Veterans Health Information Systems and Technology Architecture (VISTA) system. There are two standards that medical centers may use to connect components of an imaging system with VISTA: Digital Imaging and

Communications in Medicine (DICOM) and Healthcare Level 7 (HL-7). DICOM is an open international standard with no licensing, while HL-7 is proprietary.

We learned from VHA Headquarters program officials that DICOM has been accepted as the industry-wide standard for imaging equipment. As long as VISNs purchase this type of equipment their systems should be compatible. VISTA uses DICOM compatible systems for both <u>images</u> and <u>text</u>. Everyone uses DICOM standards for <u>images</u>.

However, the transmission of <u>text</u> can be either DICOM or HL-7 compatible. Program officials would like to have DICOM standards become a technical requirement for all imaging equipment purchases; but they can only advise VISN and medical center staff to buy systems that meet DICOM standards.

VA's National Acquisition Center staff told us that they try to "steer" medical center personnel toward DICOM compatible imaging systems, but since there is no central body in VHA to set standards, the staff of the individual medical centers make the decision.

These staff are not always interested in DICOM versus HL-7 issues. The HL-7 standards have been in use for years and vendors and medical center personnel may be more comfortable with HL-7. Thus, some medical centers have chosen HL-7 standards for PACS.

This has serious implications for continuity of care. Medical centers using HL-7 cannot communicate with DICOM facilities. As veterans relocate and move from one medical center to another, their radiological diagnostic reports may not be able to be transmitted to another facility.

Working with Department of Defense (DoD) medical facilities could also be affected by the compatibility issue. Approximately 50 VA facilities have joined the Tricare network. Although we learned that teleradiology compatibility issues have had no effect on the Tricare program because of little or no exchange of images or text between VA and DoD hospitals, this could, and should, change in the future as VHA pursues revenue streams outside of VA.

VA and DoD are working on establishing an overall framework for joint collaborations and have agreed on technical standardization and equipment as a strategic objective. However, this is still in the preliminary stages and there has been no standards development yet. While VHA specified no standard, DoD requires all contracts for imaging equipment to be in compliance with both DICOM and HL-7.

Conclusion

Acquisition of PACS technology is not being subjected to necessary compatibility and cost effectiveness standards. Unless this situation changes, between $95 and $114 million in future equipment expenditures could be at risk. Program officials should be empowered to require that all PACS purchases adhere to the DICOM standard. In addition, all PACS purchases should be subject to tests of cost effectiveness before being approved.

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DETAILS OF FINDINGS

Questionnaire Summary:

Demographic Information

We sent questionnaires to 167 facilities and received responses from 166 facilities. There were a total of 260 questions in the questionnaire. However, staff at each facility were asked to respond only to the sections that applied to them. The questionnaire was divided up as follows:

Question No's.

1 – 7   General questions for all facilities

8 – 139   Questions for separate Radiology Services and combined Radiology and Nuclear Medicine Services (often called Imaging Services)

140 – 260 Questions for separate Nuclear Medicine Services

Question No.

1.   Station and VISN name and number.--Responses were either provided or obtained by phone.

2.   Contact person for any questions we may have about the responses.--Responses were either provided or obtained by phone.

3.   Are there any satellite, community-based, etc., outpatient clinics which your facility oversees?

YES	64%
NO	36%

4.   Is your facility part of an integration? (Facilities that have been combined under one director since the implementation of VISNs.)

5.   Is your facility part of a two division hospital?

YES	15%
NO	85%

6.   Is your facility within 50 miles of a Department of Defense (DoD) medical center?

YES	33%
NO	67%

7.   Is your facility within 50 miles of other VA medical centers?

YES	30%
NO	70%

DETAILS OF EVALUATION

Questionnaire Summary:

Radiology Services and
Combined Radiology/Nuclear Medicine Services

We sent questionnaires to 167 facilities and received responses from 166 facilities. Fourteen of the facilities responding indicated that their separate radiology and combined radiology and nuclear medicine services were combined with other VA medical facilities. Since we requested each Service Chief to respond for all operations under their supervision, those 14 facilities did not need to respond to our questionnaire individually. The respondents addressed in this section consist of the following:

67   Combined Radiology and Nuclear Medicine Services

85   Separate Radiology Services (58 have a corresponding Nuclear Medicine Service-these are addressed in Appendix VII.)

152   Total Respondents in this Section

Question No.   Subject

Organization

8.   Service Chief Name. -- All respondents provided the Service Chief's name or the individual name that supervised its operations.

9.   If service operations encompass more than one facility (one chief for multiple stations), list other stations under the chief's direction. Responses to this questionnaire should address all activities under the direction of the Service Chief.

- Two service operations each encompass three facilities.
- Ten service operations each encompass two facilities.
- Other organizational situations:
  - Although one respondent said they were consolidated with another facility's Radiology Service, both facilities provided responses and both responses are included in this summary.
  - In another case, the imaging service was consolidated with a U.S. Air Force hospital. The Air Force hospital operation was not included in the questionnaire results.

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10. Is your facility affiliated with a medical school(s)?

YES	80%
NO	20%

11. Does the affiliation include radiology or nuclear medicine residents?

	Radiology	**Nuclear Medicine**
YES	45%	13%
NO	35%	24%
N/A - no affiliation or no combined imaging service	20%	63%

12. How are your Radiology and Nuclear Medicine functions organized?

Combined service	44%
Separate Radiology and Nuclear Medicine Service	38%
Radiology Service - no Nuclear Medicine Service	18%

13. What effect has combining Radiology and Nuclear Medicine Services had on equipment acquisition? *(Some provided multiple responses.)*

Positive Effect

Better coordination and prioritization	9%
Able to share some equipment resources	6%
Improved quality of care	2%
Improved staff interaction	2%
No response	26%
N/A - no combined services	56%

Negative Effect

Competition for funding limited to combined service	7%
Limited funding for imaging equipment	5%
Service proximity	1%
Extended life of nuclear medicine equipment	1%
No response	33%
N/A - no combined service	56%

14. What effect has combining Radiology and Nuclear Medicine Services had on radiation safety? *(Some provided multiple responses.)*

Positive Effect

Efficiency and cost effectiveness of safety program	11%
Staff involvement and participation	7%
Consolidation of physicist costs and inspections	4%
Consolidation of film badges services	3%
Direct access to radiation safety officer	3%
No response	19%
N/A - no combined services	56%

Negative Effect

Service Chief serves as Radiation Safety Officer	1%
No response	43%
N/A - no combined services	56%

15. What effect has combining Radiology and Nuclear Medicine Services had on other aspects of imaging operations? *(Some provided multiple responses.)*

Positive Effect

Efficient staff, equipment, and resources utilization	17%
Better coordination of imaging services	7%
Improved quality of care	6%
Better correlation of radiological and nuclear medicine studies	6%
Reduced staffing and cost savings	5%
Improved coverage by professional staff	5%
Efficient use of film storage and shared film library	5%
Improved communications	5%
Enhanced supervision and leadership	4%
No response	10%
N/A - no combined service	56%

Negative Effect

Staffing reduction -- increased workload	3%
Less autonomy and influence for Nuclear Medicine	1%
Availability of space and proximity of services to each other	1%
Availability of radiologist interested in nuclear medicine	1%
No response	36%
N/A - no combined service	56%

16. Are there any plans to combine Radiology and Nuclear Medicine Services within the facility?

YES	11%
NO	28%
N/A - combined already or Radiology Service only	62%

17. What are the expected benefits of the planned re-organization? *(Some provided multiple responses.)*

Cost saving – reduced staffing	6%
Efficient utilization of staff/ Improved quality of care (each)	5%
Improved communications	1%
No plans to combine services	28%
N/A - combined now or Radiology Service only	62%

18. Do you anticipate any impediments to, or negative effects, of the re-organization? *(Some provided multiple responses.)*

Staff cooperation and resistance to change	2%
Limited coverage by physicians of both services	1%
Maintenance of professional individuality	1%
Inappropriate staff mix	1%
No response	6%
N/A - no plans to combine services	28%
N/A - combined now or Radiology Service only	62%

19. Are there any VISN plans to consolidate your Radiology and Nuclear Medicine Services with another facility's service within the VISN?

YES	14%
NO	86%

20. Provide brief explanation of plans to consolidate imaging services within the VISN.

Twenty two services provided explanations of their plans to consolidate imaging services
Four services estimated the consolidation would be completed within two years

21. What are the expected benefits of the planned re-organization? *(Some provided multiple responses.)*

Cost savings and staff reduction	7%
Improved quality of care	4%
Better and expanded services	4%
Efficient use of staff and improved productivity	4%
Improved coverage and better communications	3%
Reduction in duplicative services and resources	3%
No response	1%
No plans to consolidate services within the VISN	86%

22. Do you anticipate any impediments to, or negative effects of, the reorganization? *(Some provided multiple responses.)*

Chief's lost productivity and limited decision making ability	2%
Concerns about job security and lack of cross training	2%
Accessibility to health-care facility by patients	1%
Reduction in services and quality	1%
No response	10%
No plans to consolidate services within the VISN	86%

23. Please send a current organization chart for your service.

Provided	93%
Did not provide	7%

Quality Management

24. Do you have a quality management (assurance/improvement) plan for your service?

YES	100%
NO	0%

25. Who is responsible for administering the plan? *(Some provided multiple responses.)*

Service Chief	60%
Technologist	22%
Radiologist	13%
Support program director/specialist	11%

26. Do you use "practice guidelines" or protocols for MRIs, CTs, or angiograms?

YES	67%
NO	33%

27. Are critical indicators or outcomes monitored?

YES	100%
NO	0%

28. List indicators or outcomes: *(Some provided multiple responses.)*

Percentage of complications	63%
Appropriateness of exams	59%
Quality control - film and image	56%
Peer review	47%

29. If critical indicators or outcomes are not monitored, how is quality assurance accomplished?

NA – All facilities monitor critical indicators or outcomes	100%

30. Are the results of the monitoring (quality assurance activities) reported outside of the service?

YES	96%
NO	4%

To whom are they reported? *(Some provided multiple responses.)*

Quality management team	51%
Clinical executive board	35%
Quality improvement committee	25%
Chief of staff	22%
Do not report results outside of service	4%

31. Is corrective action taken and documented on identified problems or exceptions?

YES	90%
NO	10%

32. Did the last JCAHO inspection identify any service level deficiencies?

YES	5%
NO	95%

33. Provide documentation of deficiencies and status of corrective action.

Provided documentation	3%
Did not provide documentation	2%
N/A – no deficiencies	95%

Examples of deficiencies were: improper "exit' signage, a machine cord was too long to prevent safety infractions, inadequate control of portable machine key, emergency "crash" carts were not checked on regular basis, and storage of films caused a fire safety hazard.

Performance Measures

34.   Do you have any performance measures for diagnostic imaging?

YES	86%
NO	14%

35.   How are performance measures used? *(Some provided multiple responses.)*

Measure production and efficiency	65%
Improve timeliness	64%
Ensure quality of care	41%
Conduct patient satisfaction surveys	26%
Do not use performance measures	14%

36.   Are there any reports on the accomplishment of performance measures?

YES	73%
NO	27%

Equipment

37.a.   Does VISN staff participate in equipment decisions?

YES	82%
NO	14%
Did not know	3%

37.b.   How does VISN staff participate in equipment decisions?

Reviews equipment requests	13%
Approves equipment requests	17%
Prioritizes equipment requests	14%
Allocates funds to procure equipment requests	5%
Other - Radiology Feasibility Study Group, participates in decisions, equipment meetings, etc.	28%
Do not know	5%
No response	4%
N/A - VISN staff does not participate in equipment decisions	14%

38.   Does VISN staff review pending requests and justifications for equipment costing:

Over $500,000	3%
Over $400,000	1%
Over $350,000	1%
Over $250,000	9%
Over $200,000	34%
Over $100,000	9%
Over $50,000	11%
Over $25,000	1%
Over $15,000	2%
Over $5,000	1%
Other – no set amount, amount varies, large ticket, etc.	3%
Do not know	5%
No response	6%
VISN staff does not participate in equipment decisions	14%

39.a. Are you satisfied with the VISN equipment prioritization process?

YES	63%
NO	14%
Do not know	16%
No response	3%
VISN does not prioritize equipment	3%

39.b. How would you improve the VISN equipment prioritization process?

Improve the evaluation of the needs of facilities	3%
Facilities need more input into process	3%
Speed the prioritization process	1%
Other - more mission based decision making, provide more equipment funding, etc.	3%
Do not know - not enough info. or experience to comment	2%
No response	3%
NA - VISN staff not involved	3%
NA - Satisfied with the process	63%

40.a. Do you have sufficient input in the selection of equipment?

YES	88%
NO	5%
Do not know	6%
No response	1%

40.b. Explain why you feel you do not have enough input.

Quality of need not assessed	2%
Other – equipment not replaced since 1985, 1 new piece of equipment per year will not keep a large dept. operating	3%
Do not know	6%
No response	1%
N/A – did have sufficient input	88%

41.a. Is the new, decentralized system of equipment acquisition an improvement over the old system and the Headquarters High Tech Committee process?

YES	61%
NO	11%
Do not know	28%

41.b Explain how the new decentralized system of equipment acquisition is an improvement over the old system.

The new system is more efficient	23%
More input into the acquisition	13%
Facilities needs are being considered	9%
Other – acquisition closely integrated into VISN plans, area of competition is much smaller, fair distribution of funds, etc.	12%
No response	5%
NA - do not know if there is an improvement-no change seen	28%
NA - there is no improvement	11%

41.c. Explain how the new, decentralized system of equipment acquisition is not an improvement over the old system and the Headquarters High Tech Committee process.

The new system takes more time to purchase equipment	1%
Other – lack of funds, needs not adequately assessed, pits Service Chiefs against each other, etc	5%
NA - there is an improvement	61%
NA – do not know if there is an improvement/no change seen	28%
No improvement/no explanation	4%

42. Who determines which device to order given the past, present and anticipated workload?

Service Chief	36%
Service Chief and another person(s)	24%
Other - chief of staff, chief technologist, radiology staff	37%
Did not know	3%

43. What is your prime source of information on equipment? *(Some provided multiple responses.)*

Vendors	82%
Professional meetings/seminars	26%
Professional and trade publication/literature	29%
Other VA facilities	20%
Colleagues	26%
Acquisition and Material Management	8%
Bio-medical engineering	6%
Past experiences	4%
Internet	3%
Research/Tests	3%
VISN	2%
End users	2%
Other - word of mouth, NAC, government contracts, etc.	21%
Did Not Know	1%

44. How many manufacturers' products were compared and considered for your last purchase over $150,000?

Three or more	82%
One or two	9%
Did not respond	9%

45. Was servicing and cost information obtained prior to the purchase?

YES	98%
NO	1%
Did not know	1%

46. Was your last request for equipment costing over $150,000 approved?

YES	86%
NO	12%
Did not know	3%

47. List utilization guidelines you use when evaluating the need for new or replacement equipment costing over $200,000. *(Some provided multiple responses.)*

Guideline	Source of Guideline(s)	
1-4 procedures/day	VA manuals	
	Cost of Outsourcing	3%
5-9 procedures/day	Western Region High Tech Committee	
	Nuclear Medicine Program Director	
	Cost of Outsourcing	6%
10-14 procedures/day	VACO	
	American College of Radiology	
	Compared to private sector contracting costs	
	Western Region High Tech Committee	3%
Over 15 procedures/day	VACO	
	American College of Radiology	3%
	Provided no utilization guideline	88%

48. Do you have teleradiology capabilities?

YES	34%
NO	66%
Total cost of teleradiology*	$23,475,204
Range of teleradiology costs*	$0 to $3,000,000
Average cost of teleradiology*	$572,566

*–Cost = funds expended in order to implement teleradiology.
 –Based on 41 facilities (10 facilities did not know cost).
 –One of the 41 reported a cost of $0.

49. What other facilities (sites) are included?

		Range of distance apart
VA - within VISN	15%	4 - 400 miles
Medical schools	11%	1 block to 200 miles
DoD facilities	5%	3 - 100 miles
VA - outside VISN	1%	665 - 1,500 miles
Did Not Know	4%	---
N/A - no teleradiology	66%	---

50. What types of images are transmitted? *(Some provided multiple responses.)*

Conventional images	16%
Nuclear medicine images	5%
CT scan	21%
MRI	6%
Ultrasound	9%
Other - CR, direct digital capture, emergency images, etc.	9%
N/A - no teleradiology	66%

51. From your experience, what do you see as the advantages or disadvantages of teleradiology? *(Some provided multiple responses.)*

Advantages

Ability to interpret image at a remote site	24%
Consultation with a sub-specialist	18%
Cost savings	12%
Other - eventually replace film, facilitates communication	13%
Do not have teleradiology capabilities	66%

Disadvantages

High cost	11%
Resolution quality	5%
No contingencies for system failure	3%
Increase in technologist's workload	3%
More impersonal	4%
Other - need for additional training, limited usefulness, ever changing technology)	16%
None	8%
Do not have teleradiology capabilities	66%

52. Do you have plans to obtain additional teleradiology capabilities within 5 years?

YES	59%
NO	41%
Total equipment costs*	$49,953,869
Range of equipment costs*	$20,000 – $3.1 million
Average equipment Costs*	$861,274

*Based on 58 facilities (31 facilities could not provide cost).

53. What other facilities will be included in your teleradiology system?

		Range of distance apart
VA – within VISN	29%	5 - 790 miles
Medical schools	17%	.1 mile to 200 miles
DoD facilities	8%	3 – 300 miles
Other – Outreach and outpatient clinics, radiologists, Indian Health Service	6%	.5 - 100 miles
N/A - no plans to add teleradiology	40%	

54. How did you determine the capability and capacity of the equipment needed? *(Some provided multiple responses.)*

Other VA facilities	13%
Vendors	12%
Workload data	9%
Determined by VISN	7%
Other – consultation, patient's clinical needs, meet industry and ACR standards, etc.	28%
Still in the process of determining	9%
Did not know	9%
N/A - no plans to add teleradiology	40%

55. Did you perform a cost/benefit analysis for the planned teleradiology capabilities? (If yes, provide documentation.)

YES	11%
NO	49%
N/A - no plans to add teleradiology	40%

Provided documentation	5%
Did not provide documentation	6%
Did not perform cost/benefit analysis	49%
N/A - no plans to add teleradiology	40%

56.   Will your imaging system conform to ACR NEMA DICOM standards?

YES	47%
NO	0%
Did not know	13%
N/A - no plans to add teleradiology	40%

57.   Do you have a picture archiving and communication system (PACS)?

YES	16%
NO	84%
Total cost of PACS	$45,774,487
Average cost of PACS	$2,080,659
Range of PACS' costs	$60,000- $7.8 million

        *Based on 22 facilities (2 facilities did not know the cost).

58.a.   Are you using any part of the DHCP radiology/nuclear medicine <u>imaging</u>
        package?

YES	25%
NO	73%
NO Response	2%

58.b.   DHCP Imaging component used.

Reporting	6%
Utilize all components	13%
Other-scheduling, order entry, etc.	9%
Not using any part of the DHCP imaging component	73%

59.   Does your system store images or capture images directly from imaging
        equipment?

Store images	9%
Capture images directly from imaging equipment	7%
Captures and stores images	15%
No Response	41%
NA	28%

60. Does your system provide interpreting physician workstations; clinical physician workstations; or images displayed on a computer monitor? (Count each station only once.)

	Interpreting	Clinical	Computer
YES	14%	13%	5%
NO	1%	3%	11%
N/A - no PACS system	84%	84%	84%
Total workstations	108 units	504 units	---
Average of workstations	5 units	25 units	---
RANGE	1 – 19 units	1 - 200 units	---

61. Do you have plans to add PACS capabilities within the next 5 years?

YES	52%
NO	48%
Total cost of PACS*	$81,655,000
Average cost of PACS*	$1,855,795
Range of PACS costs*	$100,000 – $5 million

*Based on 44 facilities (35 facilities did not know the cost).

62. How did you determine the capability and capacity of the PACS equipment needed? *(Some provided multiple responses.)*

Workload data/other VA facilities	24%
Vendors	11%
VISN	9%
Still in the process of determining	8%
Other - task force, number of distribution sites, number of consults, etc.	20%
Did not know	7%
N/A - no plan to add PACS	48%

63.a. Are you planning to use any part of the DHCP radiology/nuclear medical <u>imaging</u> package?

YES	25%
NO	16%
Did not know	11%
N/A - no plan to add PACS	48%

63.b   Which components will be used?

Some component – scheduling, demographics interface, report generation	7%
Entire imaging package	9%
Do not know which component will be used	9%
Do not know plans	11%
N/A - no plans to use the imaging package	16%
N/A - no plan to add PACS	48%

64.   Did you perform a cost/benefit analysis for the planned PACS capabilities? (If yes, provide documentation.)

YES	13%
NO	37%
Did not know	3%
N/A - no plan to add PACS	48%

Provided documentation	5%
Did not provide documentation	7%
Did not perform cost/benefit analysis	37%
Did not know if cost/benefit analysis was done	3%
N/A - no plan to add PACS	48%

65.   Have you compared the DHCP and commercial imaging systems?

YES	11%
NO	39%
Did not know	3%
N/A - no plan to add PACS	48%

66.   What was your source of information on commercial imaging systems? *(Some provided multiple responses.)*

Vendors	28%
Other VA facilities	17%
Professional meetings/Radiology Society of N. America	11%
Other - technical manuals, trade publications, NAC	19%
Did not know	14%
N/A - no plan to add PACS	48%

67.　What was your source of information on DHCP imaging systems?　*(Some provided multiple responses.)*

Other VA facilities	11%
IRM Service	8%
Vendors	4%
Other - VISN task force, professional publications, DHCP	15%
None	3%
Did not know	18%
N/A - no plan to add PACS	48%

68.　What effect do you anticipate teleradiology will have on your staffing needs?

No effect	20%
Did not know of any effect	11%
Decrease	9%
Increase	5%
Both increase and decrease	1%
Other - staff will be more efficient, better use of time, address on-call staffing issues, etc.	5%
N/A - no plan to add teleradiology	48%

69.　What effect do you anticipate PACS will have on your staffing needs?

Decrease	16%
No effect	13%
Do not know of any effect	7%
Increase	7%
Both Increase and Decrease	5%
Other - more efficient staff, restructuring of positions, additional technical training	4%
N/A - no plan to add PACS	48%

70. What do you see as the advantages or disadvantages of PACS? *(Some cited multiple advantages/disadvantages.)*

Advantages

Immediate access to images from anywhere	64%
No lost films	49%
Storage space reduction	26%
Other - film-less, better utilization of staff, efficiency	53%
N/A - no plan to add PACS	16%

Disadvantages

High cost	54%
No contingencies for system failure	17%
Resolution quality	7%
Other - timeliness of retrieval needs improvement, acceptance of staff, requires computer skills	39%
Do not know	3%
None	11%
N/A - no plan to add PACS	16%

Workload and Staffing

71. How do you count your reported workload? *(Some provided multiple responses.)*

DHCP	61%
AMIS	48%
Log book	9%

72. Does your reported workload include:

Exams that do not have a verified report	Yes	50%	No	50%
Exams performed by your staff but interpreted by staff of another facility	Yes	23%	No	77%
Exams interpreted by your staff but performed by another facility	Yes	35%	No	65%
Exams interpreted by non-radiology or nuclear medicine physicians (such as surgeons, etc.)	Yes	11%	No	89%
Exams counted more than once because there was more than one interpreting physician or technologist on the exam.	Yes	5%	No	95%
Exams counted more than once (multiple CPT codes) because of multiple sessions, sites or activities	Yes	44%	No	56%

73. Have you made any in-house changes to DHCP Management Reports?

YES	11%
NO	89%

74. Explain changes, made to DHCP reports.

> Examples of changes made to reports include: modification of reports to provide more detail and flexibility, including a template for work VA did at a DoD facility, and adding workload reports for each radiologist.

75. Is the accuracy of DHCP management reports periodically verified?

YES	69%
NO	31%

76.   By whom and how are reports verified? *(Some provided multiple responses.)*

Who: *(Top five responses)*

Technician	29%
Administrative officer	22%
Automated Data Processing Applications Coordinator (ADPAC)	10%
Service Chief	5%
Clerical staff	3%
Reports not verified	31%

Service:

Radiology or Imaging Service	62%
Various - Data validation committee, MAS	9%
Reports not verified	31%

How:

Manual count	35%
DHCP matched with other reports	8%
MAS data used	4%
Other-compared AMIS to CPT or fiscal data, spot checks,	24%
Reports not verified	31%

77.   Do you think that the DHCP management reports are useful?

YES	94%
NO	6%

78.   Explain why DHCP reports are not useful.

> The nine facilities that stated "no" gave different explanations. For example, do not reflect complexity, and too vague. One explanation, "accuracy is questionable" was given by two facilities.

79.   How is the DHCP information used? *(Some provided multiple responses.)*

Tracking workload	53%
Staff-productivity	52%
Budget-costs	30%
Reports	18%
Reports are not useful	6%

80.   How could the radiology/nuclear medicine reports be improved? *(Some provided multiple responses.)*

Better use of CPT codes for reporting workload	7%
More cost information	4%
Other – (wide variety) separate nuc. med. and radiology, do like private sector, need fields for MRI and mammograms, etc.	49%
No response	52%

81.   Are there any backlogs in your service?

YES	45%
NO	55%

82.   If there is a backlog, what area is it in and how large is it? *(Some provided multiple responses.)*

Area of Backlog		Average-days
MRI	20%	20
Ultra Sound	13%	24
CT	11%	21
Nuclear medicine	8%	21
No backlog	55%	---

What is the cause of the backlog? *(Some provided multiple responses.)*

Staffing shortages	25%
Slow equipment	19%
Increased workload	11%
Other - patient transfers, unverified reports, 2 technicians for 1 machine	10%
No backlog	55%

83.   Are there plans to alleviate the backlog?

YES	44%
NO	1%
No backlog	55%

How is the backlog going to be alleviated? *(Some provided multiple responses.)*

Purchase equipment	20%
Recruit staff	14%
Contract fee basis	7%
Other - increase productivity, timely interpretations, monitor report backlog, use staff from other MC	9%
No backlog	55%

84.   Do you have excess capacity?

YES	24%
NO	76%

Area of Excess Capacity *(Some provided multiple responses)*		**Average excess capacity/week**
CT	10%	22
Mammography	7%	19
MRI	5%	12
General radiology	3%	21
Fluoroscopy	3%	20
No excess capacity	76%	---

What is the cause of excess capacity? *(Some provided multiple responses.)*

Low or decreasing workload	11%
Equipment	9%
Efficiency	1%
Other-overstaffed, low demand, small number of female veterans	5%
No excess capacity	76%

85.   Are there plans to utilize the excess capacity?

YES	18%
NO	6%
No excess capacity	76%

Examples of plans to use excess capacity included sharing agreements, outside contracts, and accept patients outside the district.

86.   Do you use guidelines when evaluating staffing levels?

YES	34%
NO	66%

Provide the following information if guidelines were used. *(Some provided multiple responses.)*

Position		Guideline (procedures/year /FTEE)	Source of Guideline	
Radiologist	22%	7,800-12,000	ACR	8%
		10,000	VHA Dir. 10-94-087	5%
		5,000-17,687	Various guidelines	7%
Technologist	24%	2,000-2,924	AHRA	11%
		2,000-6,600	Various guidelines	10%
Guidelines not used	66%			

87.   If you do not use guidelines, what is your justification for your current staffing level? *(Some provided multiple responses.)*

Workload and cost analysis	36%
Historical pattern	7%
Professional experience	7%
Other - full coverage, waiting times, minimum staff level	32%
Use guidelines	34%

88. Has your staffing level been decreased because of budget cuts?

YES	64%
NO	36%

What positions, have been decreased because of budget cuts? *(Some provided multiple responses.)*

Position	Facilities	FTEE
Technologist	76	125.3
Clerical	67	112.3
Radiologist	35	41.5
Administrative	10	11.0

89. If you have lost positions, how have you continued to provide service? *(Some provided multiple responses.)*

Increased productivity	54%
Cut in services	16%
Contract	10%
New equipment	7%
No decrease in staffing level	36%

90. Do you provide services to another VA facility whose imaging service is <u>not</u> a part of your service?

YES	35%
NO	65%

91. If you provide services to another VA, provide the following information.

Type of Service	No. of Providers	Average Provided/Yr.	Procedures Range Provided	Total Provided/Yr.
General radiology	10	1,999	3-12,000	19,985
Nuclear medicine	6	1,293	6-4,500	7,757
MRI	24	243	10-1,200	5,832
CT	26	223	10-2,900	5,787

92. Does your service (facility) receive compensation or reimbursement for the services listed in No. 91?

YES	5%
NO	30%
Do not provide services to other VA	65%

> Seven of the fifty-three facilities that were providing services received some sort of compensation. For example, facilities were billed based on contract prices, and others received $350 for each MRI over monthly quota of twenty.

93. Do you receive services from another VA facility whose imaging service is not a part of your service?

YES	37%
NO	63%

94. If you receive services from another VA, provide the following information.

			Procedures	
Type of Service	No. of Receivers	Average Received/Yr.	Range Received	Total Received/Yr.
Nuclear medicine	16	406	3-3,600	6,495
MRI	34	153	4-673	5,217
CT	15	126	3-800	1,896
Angiograms	10	31	1-180	308

95. Does the facility that provides the services listed in No. 94 receive any compensation or reimbursement for the services?

YES	8%
NO	29%
Do not receive services from other VA	63%

> Twelve of the fifty-six facilities that were providing services received some sort of compensation. For example, facilities received supplies, reimbursement from user, or insurance payments.

96.   Provide the following staffing information: Annual cost of in-house staff should equal salary dollars (base, geographic, special pay, special qualifications, bonus)—<u>do not include fringe benefits</u>.

Radiology

	In-House FTE	Annual Cost	Contract FTE	Annual Cost
Physician	549.5	$77,200,456	108.9	$30,844,325
Technician	263.7	9,736,734	3.4	182,055
Technologist	2,235.6	79,475,784	37.2	1,494,715
Total	3,048.8	$166,412,974	149.5	$32,521,095

	In-House Average Cost/FTEE	Contract Average Cost/FTEE
Physician	$140,492	$219,096*
Technician	36,924	53,546
Technologist	35,550	39,803*

*These averages exclude $6,984,804 for physicians and $14,040 for technologists representing procedure or exam contracts for which no FTE figure could be determined.

Nuclear Medicine
(part of a combined service)

	In-House FTE	Annual Cost	Contract FTE	Annual Cost
Physician	42.5	$5,574,192	3.7	$954,172
Technician	24.0	$894,621	0	0
Technologist	164.2	$6,570,768	164.2	27,498
Total	230.7	$13,039,581	**4.3**	$981,670

	In-House Average Cost/FTEE	Contract Average Cost/FTEE
Physician	$131,157	$173,235*
Technician	37,276	0
Technologist	40,017	45,830

*This figure excludes $313,203 for which no FTE could be assigned.

97. Provide the following workload information: Use AMIS data, if accurate.

Radiology Workload - Fiscal Year 1996

Procedure	Respondents	Total	Average	Range
General diagnostic	151	4,440,455	29,407	1,206-106,686
CT scans	137	528,969	3,861	113-16,601
Ultrasound	144	404,317	2,808	40-19,359
MRI	76	137,667	1,811	40-7,524
Interventional	109	141,814	1,301	1-37,048
Mammograms	61	27,586	452	25-1,678
Other	93	179,440	1,929	10-34,499
Total	151*	5,860,248	38,810	---

*One facility provided its workload in weighted workload units and is not included in this table.

Nuclear Medicine Workload - Fiscal Year 1996
(part of a combined imaging service)

Procedure	Respondents	Total	Average	Range
Thallium	63	34,428	546	10-2,385
Therapy	40	531	13	2-40
Thyroid	62	2,225	36	1-110
Bone	66	27,260	413	49-1,300
Brain	36	1,089	30	1-166
PET scans	2	508	254	71-437
Immuno assay	14	270,160	19,297	5-60,000
Muga	62	13,228	213	3-773
Renal	63	8,710	138	2-3,771
Other	66	39,154	593	7-7,442
Total	67	397,293	5,930	---

Contracts

98.   Do you have any scarce medical specialist contracts?

YES	55%
NO	45%

99.   Please provide services purchased; number of FTEE; and annual cost for Fiscal Year 1996. *(Some provided multiple responses.)*

Radiologist/technologist	22%
Radiology service	20%
Mammograms	7%
MRI	5%
Nuclear medicine service	4%
Physicist	3%
Technician	2%
Physician	2%
CT scans	2%
N/A - no scarce medical specialist contract	45%

Total FTEE	106.3
Average FTEE	1.7
Range	0.14 - 7.58

Total annual cost	$35,520,279
Average FTEE cost*	$198,055
FTEE cost range*	$3,353-$495,023

   *Based on facilities that reported costs ($21,052,715) directly associated with FTEE.

100.   Were competitive bids used for the contracts?

YES	30%
NO	24%
N/A - no scarce medical specialist contracts	45%

101. Explain why competitive bid contracts weren't used.

Used medical school affiliate	18%
No other sources were available	2%
Other - dollar threshold does not justify competition/one bid received/competitive bids would diminish clinical patient care	4%
N/A - competitive bids used	30%
N/A - no scarce medical specialist contracts	45%

102. How was the need for the contracts determined?

Inability to recruit for position	16%
Facility unable to provide service	8%
Workload	7%
Staff unqualified to perform procedures	7%
Other - advantageous to the VA to obtain services in lieu of increasing FTEE/no radiation therapy or MRI equipment/ coverage needed for annual leave	13%
Do not know	4%
N/A - no scarce medical specialist contracts	45%

103. Is the need for existing contracts periodically evaluated?

YES	54%
Do Not Know	1%
N/A - no scarce medical specialist contracts	45%

104. How will the VISN concept affect existing and future contracts?

Consolidate contracts	9%
Other - it will be based on workload needs of individual facility/network facilities will be used whenever possible /reduce costs	12%
No effect	10%
Do not know	24%
N/A - no scarce medical specialist contracts	45%

105. Is there a shortage of qualified (in the opinion of the Service Chief) radiologists in your area?

YES	39%
NO	56%
Do not know	5%

106. Are radiologists available for employment at your medical center?

YES	52%
NO	41%
Do not know	1%
No response	6%

107. If applicable to your service, is there a shortage of qualified nuclear medicine physicians in your area?

YES	30%
NO	19%
Do not know or no response	32%
N/A – no nuclear medicine	19%

108. If applicable to your service, are nuclear medicine physicians available who could be employed by your medical center?

YES	18%
NO	28%
Do not know or no response	35%
N/A – no nuclear medicine	19%

109. Do you purchase any diagnostic imaging services on a fee basis?

YES	61%
NO	39%

110. Provide the type of service, number of procedures purchased, and total cost for fiscal year 1996.

Type of Service	Procedures	Cost	Percent of Med. Ctrs. Responding
Mammogram	9,648	$ 690,971	41%
MRI	8,701	5,712,902	39%
CT scans	1,819	1,080,361	16%
Ultrasound	2,043	431,843	15%
Angio/interventional	220	975,669	8%
General nuclear medicine	1,483	402,348	6%
General radiology	3,868	666,942	4%
Radiologists	2,160	328,243	2%
Other – DEXA scan, venus doppler, vein mapping, etc.	14,891	623,618	10%
Do not know	---	---	1%
N/A – no fee basis	---	---	39%

111. If you have sharing agreements for diagnostic imaging, please provide type of service; quantity; cost of services obtained; and cost of services provided.

		Cost	
Type of Service	**Quantity**	**Obtained**	**Provided**
CT scans	682	$228,170	
	289		$23,496
MRI	6,099	$2,239,647	
	1,791		$368,774
Mammograms	6,952	$75,432	
	1,067		$102,050
Angiograms	61	$51,383	
	*		$68,500
General radiology	91,002▲	$5,262,440	
	3,673†		$1,709,401
General nuclear medicine	363†	$141,395	
	533†		$293,978
Other - interpretation, PET scans, etc.	13,342	$1,145,320	
	842*		$25,422

*One facility did not know number of procedures provided.
▲Six facilities did not know number of procedures obtained.
†Two facilities did not know number of procedures either provided or obtained.

112. Other than sharing agreements or scarce medical specialist contracts, are there other types of contracts or agreements that you have for diagnostic imaging?

YES	28%
NO	72%

113. Please describe "other" types of contracts or agreements that you have for diagnostic imaging. *(Some provided multiple responses.)*

CT scans	3%
MRI	6%
Mammograms	5%
General radiology services	2%
General nuclear medicine service	2%
Other - interpretation, film badge service, physicist	14%
N/A - no "other" agreements	72%

Mammography

114.   Do you provide mammography services?

YES	100%
NO	0%

115.   What certifications does your facility have to provide mammography services?

ACR and VHA certification	12%
ACR, FDA, and VHA certification	8%
ACR certification	5%
VHA certification	3%
ACR, and FDA Certification	1%
N/A - do not perform mammograms in-house	71%

116.   How are mammograms provided?

Purchased on a fee basis	38%
Performed in-house	28%
Contracted out	18%
Fee basis or on contract	7%
Referred to another VA	6%
Referred to another VA or on contract	1%
Performed in-house or on fee basis	1%
Fee basis or referred to another VA	1%

117.   Have facilities that provide you with mammography services been certified?

YES	72%
N/A - performed in-house	29%

118.   Provide copies of their facility or facilities performing their mammogram certifications?

Provided	97%
Not provided	3%

Radiation Safety

119. Provide the name and title of your Radiation Safety Officer.

> All respondents provided name and title of their radiation safety officer.

120. Does your Radiation Safety Officer and Radiation Safety Committee have oversight responsibility for all aspects of radiation safety, including x-ray equipment?

YES	93%
NO	7%

121. Who is responsible for other aspects of radiation safety?

Aspect of Radiation Safety	Responsible Staff	
X-ray and mammography equipment inspections	Physicists	5%
Radiology safety program	Chief of radiology	1%
Radiation surveys	Radiologist and technologist	1%
All aspects of radiation safety	Radiation safety officer and radiation safety committee	93%

122. Does your facility provide annual radiation safety training for individuals who use radioactive material or frequent areas where radiation is emitted?

YES	97%
NO	3%

123. Does your facility provide for monitoring the radiation exposure level for individuals who use radioactive material or frequent areas where radiation is emitted?

YES	100%
NO	0%

124. Does a qualified person perform the annual survey and calibration of all x-ray equipment to ensure that the amount and direction of the radiation emitted is within acceptable limits?

YES	100%
NO	0%

125. Do you have a Nuclear Regulatory Commission (NRC) material license?

YES	84%
NO*	16%

*Did not have nuclear medicine capabilities, therefore NRC material license is not required.

126. Does your Radiation Safety Committee review your radiation safety program and quality management program annually?

YES	97%
NO	3%

127. Explain why your Radiation Safety Committee does not review your radiation safety program and quality management program annually?

The 3 percent of services whose radiation safety program is not reviewed annually by its radiation safety committee indicated they did not have a NRC license, neither did they possess any nuclear medicine capability. However, they did report radiation safety issues to their safety committee.

128. Do you document your radiation safety activities?

YES	100%
NO	0%

129. Explain why you do not document your radiation safety activities.

Not applicable, see previous question

130. Does your Radiation Safety Program utilize the recommendations of the National Council on Radiation and Measurement?

YES	98%
NO	2%

131. Did the Radiation Safety Committee identify any deficiencies in the Fiscal Year 1996 review of your radiation safety program and quality management program?

YES	10%
NO	90%

132. List the deficiencies identified by the Radiation Safety Committee. *(Some provided multiple responses.)*

Survey areas and monitor employees for radiation exposure	5%
Record keeping and completion	5%
Missing or inadequate written directives	3%
Radiation safety policies and procedures	1%
No deficiencies identified	90%

133. Were any deficiencies (or instances of non-compliance) identified in the last NRC Inspection?

YES	21%
No deficiencies identified	63%
N/A – no NRC inspection	16%

134. List the deficiencies identified during the last NRC Inspection? *(Some provided multiple responses.)*

Improper survey procedures	6%
Equipment not properly calibrated and tested	4%
Failure to maintain proper documentation	3%
Issues relating to radiation safety committee and officer	3%
Quality management program	3%
Failure to secure hot lab	3%
No deficiencies identified	63%
N/A - no NRC inspection	16%

135. Has your service contacted Headquarters program staff for guidance/assistance during the past year?

YES	15%
NO	85%

136. What program was contacted and what was the topic(s)? *(Some provided multiple responses.)*

Contacted Radiology Program:	**14%**
Teleradiology – PACS	5%
Administrative – staffing	5%
Equipment issues	4%
CPT codes -- AMIS reports	3%
Re-organization of imaging services	2%

Contacted Nuclear Medicine Program:	**4%**
Teleradiology – PACS	1%
Administrative – staffing	1%
CPT codes – AMIS reports	1%
NRC issues	1%

Did Not Contact Headquarters Staff:	**85%**

137. Was the needed guidance/assistance provided?

YES	14%
NO	1%
Did not contact Headquarters staff	85%

138. What additional service/benefit could Headquarters program staff provide to assist in the operation of your service? *(Some provided multiple responses.)*

Teleradiology – PACS guidelines	8%
CPT coding – workload reporting guidelines	7%
Equipment planning and acquisition guidelines	6%
Staffing guidelines	6%
Critical pathways -- quality Improvement	5%
Imaging services organization guidelines	5%
Share information and be available for consultation	4%
No response	71%

139. Provide a name and example of an instance where program staff have been beneficial to your operation. *(Some provided multiple responses.)*

Contacted Chief Technology Division:	**9%**
Equipment acquisition	4%
Teleradiology, PACS	3%
CPT coding issues	1%
Staffing and re-organization	1%

Contacted Director Nuclear Medicine:	**2%**
CPT coding issues	1%
Radiation safety issues	1%

Contacted Deputy Director Nuclear Med:	**1%**
CPT coding issues	1%
Radiation safety issues	1%

Contacted Senior Program Staff:	**1%**
Other - procedures and space	1%
Equipment acquisition	1%

No Response:	**83%**

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DETAILS OF FINDINGS

Questionnaire Summary:

Separate Nuclear Medicine Services

We sent questionnaires to 167 facilities and received responses from 166 facilities. Fourteen of the facilities indicated that their imaging services were combined with another VA medical facility. We requested the Service Chiefs to respond for all operations under their direction. Therefore, those 14 facilities did not need to respond to our questionnaire individually. A summary of the responses is provided below.

67	Combined Radiology and Nuclear Medicine Services are summarized in Part II.
85	Separate radiology services are included in Appendix VII (58 have corresponding nuclear medicine services that are summarized in this section.)
152	Total responses

This section summarizes the 58 responses from separate nuclear medicine services

Question No.   Subject

Organization

140.   Service Chief name. All respondents provided the name of the Service Chief or the individual that supervised operations.

141.   If service operations encompass more than one facility (one chief for multiple stations), list other stations under the chief's direction. Responses to this questionnaire should include all activities under the direction of the Service Chief.

> Four service operations each encompass two facilities.

142.   Is your facility affiliated with a medical school(s)?

YES	91%
NO	9%

143. Does the affiliation include nuclear medicine residents?

YES	50%
NO	41%
N/A - no affiliation	9%

144. Are there any plans to combine Radiology and Nuclear Medicine Services within the facility?

Yes	24%
No plans to combine services	76%

145. What are the expected benefits of the planned re-organization? *(Some provided multiple responses.)*

Cost savings -- staff reduction	14%
More efficient use of staff	7%
Patient accessibility to care area	3%
Improved cooperation -- communications	3%
No response	3%
N/A - no plans to combine services	76%

146. Do you anticipate any impediments to, or negative effects of, the re-organization? *(Some provided multiple responses.)*

Lack of autonomy	5%
Decreased quality of care	3%
Radiation safety related issues	3%
Employee related issues	3%
No response	14%
N/A - no plans to combine services	76%

147. Are there any VISN plans to consolidate your Nuclear Medicine Services with another facility's service within the VISN?

YES	14%
NO	86%

148. Provide brief explanation of plans to consolidate imaging services within the VISN.

> Eight services provided explanations of their plans to consolidate imaging services within their respective VISN. Five estimated their consolidation would be completed within two years.

149. What are the expected benefits of the planned re-organization? *(Some provided multiple responses.)*

Improved performance and quality of care	10%
Cost savings and staff reduction	5%
Expanded services and accessibility to studies and readings	5%
Efficient use of staff	3%
No response	2%
N/A - no plans to combine services	86%

150. Do you anticipate any impediments to, or negative effects of, the reorganization? - None anticipated.

151. Please send a current organization chart for your service.

Provided	95%
Not provided	5%

Quality Management

152. Do you have a quality management (assurance/improvement) plan for Nuclear Medicine Service?

YES	100%
NO	0%

153. Who is responsible for administering the plan? *(Some provided multiple responses.)*

Service Chief	60%
Support program director/specialist	21%
Physicist	14%
Technologist	12%

154. Are critical indicators or outcomes monitored?

YES	100%
NO	0%

155. List indicators/outcomes: *(Some provided multiple responses.)*

Appropriateness of exam	69%
Improve timeliness	43%
Monitor diagnostic accuracy	40%
Other - peer review, perfusion treadmill test, second opinion	41%

156. Explain how quality assurance is accomplished if indicators or outcomes aren't monitored.

N/A – all facilities monitor critical outcomes or indicators	100%

157. Are the results of the monitoring (quality assurance activities) reported outside of the service?

YES	88%
NO	12%

To whom are they reported? *(Some provided multiple responses.)*

Quality management team	36%
Chief of staff	26%
Clinical executive board	24%
Radiation safety committee	21%
Do not report monitoring results outside of service	12%

158. Is corrective action taken and documented on identified problems or exceptions?

YES	91%
NO	9%

159. Did the last JCAHO inspection identify any service level deficiencies?

YES	5%
NO	95%

160. Provide documentation of deficiencies and corrective action taken.

Provided documentation	2%
Did not provide documentation	3%
No deficiencies	95%

Examples of deficiencies were: physical inventory of sealed source was not conducted, surveys for removable contamination were not done, a syringe radiation shield was not used while preparing a radiopharmaceutical kit.

Performance Measures

161. Do you have any performance measures for diagnostic imaging?

YES	84%
NO	16%

162. How are performance measures used? *(Some provided multiple responses.)*

Improve timeliness	76%
Evaluate appropriateness	38%
Ensure quality of care	29%
Monitor diagnostic accuracy	24%
Do not use performance measures	16%

163. Are there any reports on performance or performance measures?

YES	74%
NO	26%

Equipment

164. Does VISN staff participate in equipment decisions?

YES	66%
NO	19%
Did not know	16%

How does VISN staff participate in decisions? *(Some provided multiple responses.)*

Review equipment requests	24%
Approve equipment requests	21%
Prioritize equipment requests	9%
Allocate funds to procure equipment	7%
Other	3%
Did not know	17%
N/A - VISN staff not involved	19%

165. Does VISN staff review pending requests and justifications for equipment costing:

Over $500,000	2%
Over $350,000	3%
Over $250,000	3%
Over $200,000	36%
Over $100,000	3%
Over $50,000	3%
Over $25,000	3%
Over $15,000	2%
Over $5,000	2%
Other – no dollar amount provided or amount varies	5%
Did not know	17%
N/A - VISN staff not involved	19%

166.a. Are you satisfied with the VISN equipment prioritization process?

YES	34%
NO	12%
Did not know – no experience	35%
N/A - VISN staff not involved	19%

166.b. How would you improve the VISN equipment prioritization process?

Improve the evaluation of facilities needs	2%
Increase facility input	5%
Other – need goals and a plan, more equitable distribution of funds	3%
Did not know	2%
NA – no experience with process	35%
NA –Satisfied with the process	12%
NA – VISN not involved	19%

167.   Do you have sufficient input in the selection of equipment?

YES	79%
NO	5%
Did not know	12%
No response	3%

168.a. Is the new, decentralized system of equipment acquisition an improvement over the old system and the Headquarters High Tech Committee process?

YES	41%
NO	12%
Did not know – no experience	40%
No response	7%

168.b. Explain how the new, decentralized system of equipment acquisition is an improvement over the old system. *(Some provided multiple responses.)*

More input from the medical facility	12%
Facilities' needs are being considered	10%
More efficient	7%
Other – able to negotiate, funds are available at VISN level	10%
No response	9%
NA - felt there was no improvement	12%
NA – did not know if there was an improvement	40%

169. Who determines which device to order given the past, present and anticipated workload?

Chief Radiology Service	36%
Chief Radiology Service and another person(s)	24%
Other – clinical support program manager, diagnostic service product line team, etc.	33%
Did not know	7%

170. What is your prime source of information on equipment? *(Some provided multiple responses.)*

Vendors	72%
Professional meetings and seminars	48%
Professional publication and literature	21%
Other VA facilities	16%
Colleagues	10%
Other – other users, Acquisition and Materiel Management Service, bio-medical engineering, etc.	29%
Did not know	2%

171. How many manufacturers' products were compared and considered for your last purchase over $150,000?

Three or more	90%
One or two	3%
Did not provide number	7%

172. Was servicing and cost information obtained prior to the purchase?

YES	97%
Did not know	3%

173. Was your last request for equipment costing over $150,000 approved?

YES	62%
NO	33%
Did not know	5%

174. List utilization guidelines you use when evaluating the need for new or replacement equipment costing over $200,000. *(Some provided multiple responses.)*

Guideline	Source of Guideline	
1 – 4 procedures/day	–VACO – VISN 16 –Nuclear medicine literature	3%
5 – 9 procedures /day	–American College of Nuclear Physicians –Local experience	7%
No quantifiable guidelines	---	21%
No guidelines	---	66%
No response	---	5%

175. Do you have telenuclear medicine capabilities?

YES (19 responses)	33%
NO	67%
Total cost of telenuclear medicine*	$2,562,046
Range of telenuclear medicine costs*	$0 to $1,142,156
Average cost of telenuclear medicine*	$150,709

*Based on 17 facilities (2 facilities did not know the cost).
 Two of the remaining 15 reported a cost of 0 dollars.

176. What other facilities (sites) are included?

Facility		Range
VA - Within VISN	16%	18 - 442 miles
Medical Schools	7%	1 - 20 miles
DoD Facility	2%	47 miles
Did not know	7%	---
N/A - no telenuclear medicine	67%	---

177. What types of images are transmitted? *(Some provided multiple responses.)*

Nuclear medicine images	17%
Emergent, PET, and test images	14%
Ultra-sound images	3%
CT scans	2%
MRI images	2%
Did not know	5%
N/A - no telenuclear medicine	67%

178. From your experience, what do you see as the advantages or disadvantages of telenuclear medicine? *(Some provided multiple responses.)*

Advantages

Ability to interpret image at a remote site	16%
Consultation with a Sub-specialist	12%
Other – lower radiologist fees, less patient travel, more efficient emergency coverage, etc.	19%
N/A - no telenuclear medicine	67%

Disadvantages

Resolution quality	3%
Lack of immediate presence of physician	3%
Slow modems	2%
Potential for decreased access to old studies	2%
Inability to personally examine patient	2%
None	21%
N/A - no telenuclear medicine	67%

179. Do you have plans to obtain additional telenuclear medicine capabilities within the next 5 years?

YES	36%
NO	64%
Total equipment costs	$2,755,000
Range of equipment costs	$30,000- $1.8 million
Average equipment costs	$459,167

180. What other facilities will be included in your telenuclear medicine system? *(Some provided multiple responses.)*

Facility		Range
VA - Within VISN	16%	15 - 300 miles
Medical Schools	7%	.25 - 12 miles
DoD Facilities	5%	50 - 300 miles
Other – Opt. Clinic, private medical center, etc.	5%	7 - 60 miles
Did not know	10%	---
N/A - no telenuclear medicine	64%	---

181. How did you determine the capability and capacity of the equipment needed? *(Some provided multiple responses.)*

Determined by VISN	14%
Workload data	10%
Other – existence of sharing agreements, number of staff, estimate and test transmission speeds, cost of equipment	10%
Other VA facilities	7%
Vendors	2%
Still in the process of determining	2%
Did not know	5%
N/A - no plans to add telenuclear medicine	64%

182. Did you perform a cost/benefit analysis for the planned telenuclear medicine capabilities?

YES	3%
NO	33%
N/A - no plans to add telenuclear medicine	64%

183. Will your imaging system conform to ACR NEMA DICOM standards?

YES	28%
NO	3%
Did not know	5%
N/A - no plans to add telenuclear medicine	64%

184. Do you have a Picture Archiving and Communication System (PACS)?

YES	12%
NO	88%
Total cost of PACS*	$1,066,000
Average cost of PACS*	$355,333
Range of PACS' costs*	$50,000 - $700,000

*Based on three facilities (two facilities did not know the cost and two systems were part of a gamma camera package).

185.a. Are you using any part of the DHCP radiology/nuclear medicine imaging package?

YES	19%
NO	71%
No response	9%

185.b. DHCP Imaging Component Used.

All	9%
Reporting only	5%
Nuclear medicine imaging archive	2%
Other – MIS info., CPT codes, etc.	3%
None	9%
N/A – are not using imaging package	71%

186. Does your system store images or capture images directly from imaging equipment?

Stores images/captures images directly from imaging equip.	29%
Stores images	7%
Captures images from imaging equipment	3%
Neither	43%
N/A	17%

187. Does your system provide interpreting physician workstations; clinical physician workstations; or images displayed on a computer monitor?

	Interpreting	Clinical	Computer
YES	10%	5%	2%
NO	2%	7%	10%
N/A - no PACS system	88%	88%	88%
Total workstations	12	6	--
Average workstations	2	2	--
Range	1 - 4	1 - 3	--

188. Do you have plans to add PACS capabilities within the next 5 years?

YES	38%
NO	62%
Total cost of PACS	$17,837,300
Average cost of PACS	$1,372,100
Range of PACS costs	$13,800 – $9 million

189. How did you determine the capability and capacity of the PACS equipment needed? *(Some provided more than one responses.)*

Vendors	9%
VISN	7%
Workload data	5%
Other VA facilities	5%
Still in the process of determining	5%
Other – literature, required standards, etc.	21%
Did not know	2%
N/A - no plan to add PACS	62%

190.a. Are you planning to use any part of the DHCP radiology/nuclear medical imaging package?

YES	17%
NO	17%
Did not know	3%
N/A - no plan to add PACS	62%

190.b. Which components will be used?

Some component – archiving, patient demographics, reporting	14%
Entire radiology/nuclear medicine imaging package	3%
Do not know if imaging package will be used	3%
N/A - no plans to use the imaging package	17%
N/A - no plan to add PACS	62%

191. Did you perform a cost/benefit analysis for the planned PACS capabilities?

YES	10%
NO	26%
Did not know	2%
N/A - no plan to add PACS	62%

192. Have you compared the DHCP and Commercial imaging systems?

YES	5%
NO	28%
Did not know	5%
N/A - no plan to add PACS	62%

193. What was your source of information on commercial imaging systems? *(Some provided multiple responses.)*

Vendors	21%
RSNA/Professional Meetings	5%
Other VA Facilities	3%
Other – consultants, Chair Host Com., etc.	21%
Did not know	9%
N/A - no plan to add PACS	62%

194. What was your source of information on DHCP imaging systems? *(Some provided multiple responses.)*

Vendors	3%
Other VA Facilities	3%
IRM Service	2%
Other – Chairman HOST Committee, hospital support personnel, RSNA	16%
Did not know	12%
None	5%
N/A - no plan to add PACS	62%

195. What effect do you anticipate PACS will have on your diagnostic imaging staffing needs?

No effect	19%
Decrease	5%
Increase	2%
Did not know	12%
N/A - no plan to add PACS	62%

196. What effect do you anticipate telenuclear medicine will have on your staffing needs?

No effect	16%
Increase	5%
Decrease	5%
Did not know	12%
N/A -no plan to add tele-nuclear med.	62%

197. What do you see as the advantages or disadvantages with PACS? *(Some provided multiple responses.)*

Advantages

Immediate access to images	40%
No lost films	29%
Storage space reduction	19%
Other – fast access to images, quality of images, information is organized, better turn around time for reports	43%
No response	43%

Disadvantages

High cost	38%
Transition and special training required	10%
No contingencies for system failure	9%
Resolution quality	5%
Other – lack of interaction between physician, patient, tech.; poor interface, limited viewing , etc.	16%
Did not know	7%
None	7%
No response	38%

Workload and Staffing

198. How do you count your reported workload? *(Some provided multiple responses.)*

DHCP	86%
LOG	17%
AMIS	3%

199. Does your reported workload include:

Exams that do not have a verified report	Yes	21%	No	79%
Exams performed by your staff but interpreted by staff of another facility	Yes	10%	No	90%
Exams interpreted by your staff but performed by another facility	Yes	12%	No	88%
Exams interpreted by non-radiology/nuclear physicians (such as surgeons, etc.)	Yes	7%	No	93%
Exams counted more than once because there was more than one interpreting physician or technologist on the exam.	Yes	2%	No	98%
Exams counted more than once (multiple CPT codes) because of multiple sessions, sites or activities.	Yes	47%	No	53%

200. Have you made any in-house changes to DHCP management reports?

YES	5%
NO	95%

201. Explain changes made to DHCP reports.

One medical center reconfigured some of the DHCP screens; one modified the system to capture the film count; and one devised new reports.

202. Is the accuracy of DHCP management reports periodically verified?

YES	60%
NO	40%

203.   By whom and how are reports verified?

Who: (position)

Technician	14%
ADPAC	12%
Service Chief	12%
Other - QA meetings, chemist, physician, health specialist	16%
Reports not verified	40%

Service:

Nuclear Medicine Service	48%
Various – MAS, IRM, clinical support, etc.	12%
Reports not verified	40%

How:

Manual count	22%
DHCP-cross check against other reports	9%
DSS-compare workload cost data with DSS	3%
Other-MAS outpatient reports, random sampling, QA reviews	26%
Reports not verified	40%

204.   Do you think that the DHCP management reports are useful?

YES	78%
NO	22%

205.   Explain why DHCP reports are not useful.

Local reports are used instead of DHCP	5%
Reports are invalid and inaccurate	5%
Don't use – no reason given	5%
DHCP reports are too inflexible	3%
Other-not user friendly, no credit for radiation safety	4%
Felt reports were useful	78%

206.   How is the DHCP information used? *(Some provided multiple responses.)*

Tracking workload	43%
Preparing reports	21%
Budget	19%
Staffing	14%
Felt reports were not useful	22%

207. How could the DHCP management reports be improved? *(Some provided multiple responses.)*

More user friendly	10%
Sort and count workload and procedures by CPT codes	5%
Other- verify accuracy, more flexibility, modify data entry	48%
No response	41%

208. Are there any backlogs in your service?

YES	45%
NO	55%

209.a. If there is a backlog, what area is it in and how large is it? *(Some provided multiple responses.)*

Area		Average-days
Thallium	14%	31
Cardiology	10%	35
Myocardial procedures	10%	29
General nuclear medicine	7%	20
Other-bone tests, transcription, scheduling	9%	5
No backlog	55%	---

209.b. What is the cause of the backlog? *(Some provided multiple responses.)*

Staffing shortage	24%
Old, unreliable equipment	22%
Increased workload	3%
Service restructuring	2%
Scheduling	2%
No backlog	55%

210.a. Are there plans to alleviate the backlog?

YES	43%
NO	2%
No backlog	55%

210.b. How is the backlog going to be alleviated? *(Some provided multiple responses.)*

New equipment	19%
Improve efficiency	16%
More staff	12%
Cross-training	5%
No backlog	55%

211.a. Do you have excess capacity?

YES	21%
NO	79%

Area		Average/week*
General	9%	33
Bone	7%	21
Cardiac	5%	10
Thyroid	3%	4
No excess capacity	79%	---

*Three services did not provide figures.

211.b. What is the cause of excess capacity? *(Some provided multiple responses.)*

Low workload	9%
Better equipment	9%
Future telemedicine expansion	2%
Improved efficiency	2%
No excess capacity	79%

212. Are there plans to utilize the excess capacity?

YES	16%
NO	5%
No excess capacity	79%

Examples of plans to use excess capacity included sharing agreements; market services to the private sector, other VAMC; and to expand telenuclear medicine.

213. Do you use guidelines when evaluating staffing levels?

YES	29%
NO	71%

214.a. Provide the following information if guidelines were used. *(Some provided multiple responses.)*

Position		Guideline (Procedures/ Year/FTEE)	Source of Guideline	
Physician	12%	5,999	"Radiology Mgmt." (journal article)	2%
		2,000	ACNP Nuc. Facility. Rpt 1988	2%
		2,000-12,000	Various guidelines	9%
Technologist	29%	880-1,320	Local	5%
		890-988	AHRA	5%
		1,250	Amer. Col. of Nuc. Med.	2%
		880-1,200	Various guidelines	17%
Guidelines not used	71%	---	---	---

214.b. If you do not use guidelines, what is your justification for your current staffing level? *(Some provided multiple responses.)*

Workload and cost analysis	45%
Other-timeliness, compare with other hospitals, min. staffing	33%
Professional experience	9%
Historical pattern	5%
Use guidelines	29%

215. Has your staffing level been decreased because of budget cuts?

YES	55%
NO	45%

What positions have been decreased because of budget cuts? *(Some provided multiple responses.)*

Position	Facilities	FTEE
Technologist	22	29.8
Physicians	14	14.4
Clerical	13	13.5
Administrative	4	3.3

216. If you have lost positions, how have you continued to provide service? *(Some provided multiple responses.)*

Increased productivity	34%
Cut services	10%
Contract	7%
Reorganized	5%
Overtime	3%
No decrease in staffing level	45%

217. How have the changes described in No. 216 affected quality of service provided?

No change	24%
Delays	14%
Cuts in services	7%
Services improved	5%
No decrease in staffing level	45%

218. Do you provide services to another VA facility whose Nuclear Medicine Service is not a part of your service?

YES	50%
NO	50%

219. If you provide services to another VA, provide the following information.

Type of Service	No. of Providers	Procedures Average Provided/Yr.	Procedures Range Provided	Procedures Total Provided/Yr.
Immuno assays	2	5,198	396-10,000	10,396
Interpretations	10	233	3-1,000	2,329
Scans	2	1,026	3-2,048	2,051
Bone	2	123	5-240	245

220. Does your service (facility) receive compensation or reimbursement for the services listed in No. 219?

YES	9%
NO	41%
Do not provide services to other VA	50%

Five of the twenty-nine facilities that were providing services received some sort of compensation. For example, services were billed through main chemistry lab, and others were reimbursed for cost of radio-pharmaceuticals.

221. Do you receive services from another VA facility whose nuclear medicine service is not a part of your service?

YES	16%
NO	84%

222. If you receive services from another VA, provide the following information.

Type of Service	No. of Receivers	Procedures Average Received/Yr.	Procedures Range Received	Procedures Total Received/Yr.
Interpretations	4	6,733	3-25,990	26, 931
Isotope production	1	---	---	52
Scans	1	---	---	50

223. Does the facility that provides the service receive any compensation or reimbursement for the services listed in No. 222?

YES	4%
NO	12%
Do not receive services from other VA	84%

Two of the nine facilities receive reimbursement of costs for services rendered.

224. Provide the following staffing information: annual cost of in-house staff should equal salary dollars (base, geographic, special pay, special qualifications, bonus)—do not include fringe benefits.

	FTE	In-House Annual Cost	FTE	Contract Annual Cost
Physician	80.47	$10,437,556	3.9	$1,168,275
Technician	47.4	1,885,963	0	2,850
Technologist	209.55	8,346,441	.35	40,477
Total	337.42	$20,669,960	4.25	$1,211,602

	In-House Average Cost/FTEE	Contract Average Cost/FTEE
Physician	$129,707	$203,276*
Technician	39,788	NA
Technologist	39,830	$119,648

*This average excludes $375,499 for which no FTE figures could be assigned.

225. Provide the following workload information:

Procedure	Respondents	Total	Average	Range
Thallium	55	41,911	762	8-2,295
Therapy	52	1,378	27	1-712
Thyroid	55	2,764	68	9-261
Bone	55	28,697	522	5-2,763
Brain	45	2,175	48	1-532
PET scans	7	2,329	333	5-1,098
Immuno assay	20	427,666	21,383	56-80,087
Muga	55	16,441	299	3-1,983
Renal	55	7,055	128	6-588
Other	57	65,866	1,156	23-6,757
Total	57*	596,282	10,461	---

* One respondent did not provide this information.

Contracts

226. Do you have any scarce medical specialist contracts?

YES	17%
NO	83%

227. Please provide services purchased; number of FTEE; and annual cost for Fiscal Year 1996. *(Some provided multiple responses.)*

Nuclear medicine physician	7%
Physicist	7%
Image interpretation	3%
Radiologist	2%
Technologist	2%
N/A - no scarce medical specialist contracts	83%

Total FTEE	6.15
Average FTEE	0.5
Range	0.25 - 2.0

Total annual cost	$2,824,783
Average FTEE cost	$207,371*
FTEE cost range	$152,308-$222,500

*This average excludes $1,549,449 for which no FTE could be assigned.

228. Were competitive bids used for the contracts?

YES	9%
NO	9%
N/A - no scarce medical specialist contracts	83%

229. Explain why competitive bid contracts weren't used.

Utilized a medical school affiliate	9%
N/A - competitive bids used	9%
N/A - no scarce medical specialist contracts	83%

230. How was the need for the contracts determined?

Inability to recruit for position	3%
Regulatory agencies' requirements, e.g. JCAHO and NRC	3%
Other--Workload staffing analysis/ prevent backlogs during leave usage/ director's decision/additional expertise needed for new multi-headed cameras	9%
Do not know	2%
N/A - no scarce medical specialist contracts	83%

231. Is the need for existing contracts periodically evaluated?

YES	17%
N/A - no scarce medical specialist contracts	83%

232. How will the VISN concept affect existing and future contracts?

No effect	2%
Increased purchasing power and more service contract discounts	2%
The need for future contracts will diminish	2%
Do not know	12%
N/A - no scarce medical specialist contracts	83%

233. Is there a shortage of qualified (in the opinion of the Service Chief) nuclear medicine physicians in your area?

YES	57%
NO	36%
Do not know	7%

234. Are nuclear medicine physicians available for employment at your medical center?

YES	36%
NO	47%
Do not know	17%

235. Do you purchase any nuclear medicine services on a fee basis?

YES	17%
NO	81%
Do not know	2%

236. Provide the type of service, number of procedures purchased, and total cost for Fiscal Year 1996.

Type of Service	Procedures	Total Cost	
Emergent/after-hours scans	10	$10,800	5%
PET scans	26	$15,363	3%
Technologist	N/A	$38,800	3%
Other – peer review, bone scans, renal exams, etc.	156	$40,184	5%
Do not know	N/A	N/A	2%
NA - do not use fee basis	N/A	N/A	81%

Sharing Agreements

237. If you have sharing agreements for diagnostic imaging, please provide type of service; quantity; cost of services obtained; and cost of services provided.

Type of Service	Quantity	Cost Obtained	Cost Provided	
Bone scans	101	$1,100		2%
	51		$7,407	5%
PET scans	368	$218,242		3%
	79		$115,340	2%
General nuclear medicine	52	$9,680		3%
	398		$12,675	7%
Other - reading of exams, schillings test, stress	151	$14,257		5%
	42		$49,799	14%

238. Other than sharing agreements or scarce medical specialist contracts, are there other types of contracts or agreements that you have for diagnostic imaging?

YES	10%
NO	90%

239. Please describe other types of contracts or agreements that you have for diagnostic imaging.

Medical physicist	7%
CHAMPVA provider	1%
Coverage for annual or other leave	2%
N/A - no other contracts or agreements	90%

Radiation Safety

240. Provide the name and title of your Radiation Safety Officer.

> All respondents provided name and title of their radiation safety officer.

241. Does your Radiation Safety Officer and Radiation Safety Committee have oversight responsibility for all aspects of radiation safety, including x-ray equipment?

YES	95%
NO	5%

242. Who is responsible for other aspects of radiation safety?

Aspect of Radiation Safety	Responsible Staff	
X-ray equipment inspections	Physicists	2%
Service radiology safety program	Chief of Radiology	2%
X-ray equipment inspection.	Individual with Ph.D.	1%
All aspects of radiation safety and x-ray equipment	Radiation safety officer and radiation safety committee	95%

243. Does your facility provide annual radiation safety training for individuals who use radioactive material or frequent areas where radiation is emitted?

YES	100%
NO	0%

244. Does your facility monitor the radiation exposure level for individuals who use radioactive material or frequent areas where radiation is emitted?

YES	100%
NO	0%

245. Does a qualified person perform the annual survey and calibration of all x-ray equipment to ensure that the amount and direction of the radiation emitted is within acceptable limits?

YES	100%
NO	0%

246. Do you have a Nuclear Regulatory Commission (NRC) material license?

YES	100%
NO	0%

247. Does your Radiation Safety Committee review your radiation safety program and quality management program annually?

YES	100%
NO	0%

248. Explain why your Radiation Safety Committee does not review your radiation safety program and quality management program annually.

> Does not apply, see previous question.

249. Do you document your radiation safety activities?

YES	100%
NO	0%

250. Explain why you do not document your radiation safety activities to ensure compliance with applicable regulatory agencies.

> Does not apply, see previous question.

251. Does your Radiation Safety Program utilize the recommendations of the National Council on Radiation and Measurement?

YES	98%
NO	2%

252. Did the Radiation Safety Committee identify any deficiencies in the Fiscal Year 1996 review of your radiation safety program and quality management program?

YES	14%
NO	86%

253. List the deficiencies identified by the Radiation Safety Committee: *(Some provided multiple responses.)*

Documentation and records retention	9%
Quality management program	7%
Radiation safety procedures	5%
Signage and data loss	3%
No deficiencies identified	86%

254. Were any deficiencies (or instances of non-compliance) identified in the last NRC Inspection?

YES	34%
No deficiencies identified	66%

255. List the deficiencies identified during the last NRC Inspection: *(Some provided multiple responses.)*

Lack of timely and proper surveys	16%
Lack of documentation and records retention	12%
Lack of security to restricted areas and radioactive materials	10%
Improper disposal of radioactive waste	5%
Failure to obtain bioassay	5%
No deficiencies identified	66%

National Headquarters Guidance

256. Has your service contacted Headquarters program staff for guidance/assistance during the past year?

YES	50%
NO	50%

257. What program was contacted and what was the topic(s)? *(Some provided multiple responses.)*

Contacted Nuclear Medicine Program:	**50%**
CPT codes and workload reporting and staffing/ cost accounting	26%
NRC licensing, film badges, and radiation safety issues	19%
Consolidation of nuclear medicine	7%
Equipment acquisition	7%

Did Not Contact Headquarters Staff:	**50%**

258. Was the needed guidance/assistance provided?

YES	45%
NO	5%
Did not contact Headquarters staff	50%

259. What additional service/benefit could Headquarters program staff provide to assist in the operation of your service? *(Some provided multiple responses.)*

Equipment and radio-pharmaceutical acquisition	16%
Radiation safety issues and NRC master licensing	16%
Annual report and conference calls	10%
DHCP nuclear medicine software	10%
Educational standards and nuclear medicine residents	7%
CPT coding and workload reporting	9%
Staffing guidelines	9%
PACS and telenuclear medicine	7%
No response	48%

260. Provide a name and example of an instance where program staff (or their work, i.e., guidance issued) have been beneficial to your operation. *(Some provided multiple responses.)*

Contacted Director Nuclear Medicine:	16%
CPT coding and workload reporting	10%
Re-organization issues	5%
Other, - radiation safety, equipment acquisition	5%

Contacted National Health Physicist:	10%
Radiation safety issues	10%

Contacted Deputy Director Nuclear Medicine:	9%
CPT coding and workload reporting	9%
Other, - radiation safety, equipment acquisition	5%

Contacted VACO Program Staff:	7%
CPT coding and workload reporting	3%
Other - equipment acquisition	3%

No Response:	67%

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DETAILS OF FINDINGS

Total Staffing for Nuclear Medicine Activities

(Separate Nuclear Medicine Services and Combined Imaging Services)

Total Staffing and Cost

Position	In-House		Contract	
	FTE	Annual Cost	FTE	Annual Cost
Physician	123.0	$16,011,748	7.6	$2,122,447
Technician	71.4	2,780,584	0	2,850
Technologist	373.7	14,917,209	1.0	67,975
Total	568.1	$33,709,541	8.6	$2,193,272

Average FTE Cost

Position	In-House Annual Cost	Contract Annual Cost
Physician	$130,177	$188,651*
Technician	38,944	2,850
Technologist	39,918	67,975

*This average excludes $688,702 for which no FTE could be assigned.

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**Department of
Veterans Affairs**   **Memorandum**

Date: JUN 15, 1999

From: Under Secretary for Health (10/105E)

Subj: OIG Draft Report: *Evaluation of VHA Radiology and Nuclear Medicine
Activities*

To: Assistant Inspector General for Auditing (52)

1. Involved VHA program managers have reviewed this draft report, and there is
general concurrence with your findings and recommendations. We also generally
concur in your estimate of the funds that <u>might</u> be at risk if medical centers do not
properly plan and coordinate acquisition of picture archiving and communications
systems (PACs). I believe, however, that VHA is taking the necessary actions to rectify
the legitimate issues that you raise.

2. The need for more reliable and consistent workload reporting is a concern that we
have long recognized. This is a recurring theme in many of your reports, and we are
making significant progress systemwide in addressing the many complex variables that
can directly influence implementation of valid workload reporting mechanisms. It is
notable that such does not exist anywhere in healthcare.

3. As detailed in the accompanying action plan, a special work group, composed of
staff from the Chief Information Office and Radiology/Nuclear Medicine Diagnostic
Services, are currently identifying needed software modifications that are required in the
VistA Radiology Package. From data extracted from the Radiology Package, VHA's
Decision Support System (DSS) will then be utilized to produce uniform workload
reports, which can also be used to compare the reporting among individual facilities and
the Network Offices. The work group will first agree upon universal counting
requirements, and then make necessary software modifications to ensure system
compatibility. At the same time, both Radiology and Nuclear Medicine Services are in
the process of identifying policy and procedural changes that will be required with
implementation of a uniform reporting system.

4. We also share OIG's concern about the lack of a clear correlation between staffing
levels/workload among same-type facilities throughout the system. Similar issues have
also been identified in other clinical and administrative program areas, and we continue
to struggle in our attempts to come up with some sort of a workable formula that could
provide a framework for valid, practical "staffing guidelines." Nuclear Medicine Service
has actually been working in close coordination with VHA's Health Services Research
and Development Service (HSR&D) for the past several years to develop a statistically
valid algorithm to assist in identifying appropriate staffing levels based on reported

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Page 2 OIG Draft Report: **Evaluation of VHA Radiology and Nuclear Medicine Activities**

workload calculations. Using work already completed by Nuclear Medicine and HSR&D, Radiology Service has also formed a work group to apply a similar algorithm. These efforts, of course, will only be successful when a uniform workload reporting system is implemented, and the respective work groups will work in coordination with each other to assure consistency in approach.

5. In terms of establishing a compatibility standard for PACs and teleradiology equipment, VHA is making significant progress in developing standard interface protocols. Specific details are included in our action plan. The National Acquisition Center (NAC) is VHA's centralized source of information about PACs purchases and required Request for Proposal (RFP) contents. We are exploring the potential to have NAC review and recommend purchases of all commercial PACs. Inclusion of VA Digital Imaging and Communications in Medicine (DICOM) conformance statements in proposed purchases of modalities and PACs is also now required. Additional oversight of PACs purchasing activity is provided by the Department's Capital Investment Board, which now reviews all capital medical equipment procurements estimated at $1 million or more. This will include virtually all of the PACs acquisitions. A policy that addresses need for cost/benefit analyses for equipment falling below the $1 million threshold will also be issued by September 1, 1999.

6. Finally, I am able to report that recruitment of a new Director, Radiology Service, is now actively being pursued, and we hope to select a qualified clinician for this position by the end of this fiscal year.

7. We very much appreciate the thoroughness and cooperative efforts of your evaluators, and believe that their observations accurately focus on opportunities for program improvement. The report, including items identified in the Management Advisory, will be shared with all VISN offices. If additional assistance or information is required, please contact Paul C. Gibert, Jr., Director, Management Review and Administration, Office of Policy and Planning, at 273-8355.

Original signed by ROBYN NISHIMI for
Kenneth W. Kizer, M.D., M.P.H.

Attachment

Action Plan in Response to OIG/GAO/MI Audits/Program Evaluations/Reviews

Name of Report: OIG Draft Report: *Evaluation of VHA Radiology and Nuclear Medicine Activities*
Report Number: none
Date of Report: N/A

_____

| Recommendations/ | Status | Completion |
| Actions | | Date |

_____

Recommendation 1:
The Under Secretary for Health should establish a uniform workload reporting mechanism for Radiology and Nuclear Medicine Services.

Concur

We have also identified the need for more reliable and consistent workload reporting mechanisms in Radiology and Nuclear Medicine Services. A VistA Radiology Package work group is currently being formed by the Diagnostic Services Strategic Health Group (115) in the Office of Patient Care Services. This group will be chaired by a field facility Chief of Radiology/Nuclear Medicine, and will include field clinicians and VistA radiology package administrators. Headquarters staffing support and coordination will be provided by staff from Patient Care Services and the Chief Information Office. The group will identify specific software modifications that are required in the VistA Radiology Package and recommend universal business rules that must be implemented to assure systemwide consistency in workload counting. Modifications will be made to more tightly control the mapping of procedures and CPT codes to workload. Capability to produce the uniform workload reports currently exists within the Decision Support System (DSS), which can also be used to compare productivity of different medical centers and VISNs. The work group will focus on identifying the actions that are required to facilitate the necessary interface between the two systems. Once the rules are clearly defined, the VistA Radiology Package will be modified to enforce the rules. This will involve changes in data entry, changes in the calculation of workload and actual changes to the reports, if necessary. The group will convene in July 1999, with a target date of October 1, 1999 to submit recommendations to the Under Secretary for Health for implementation approval.

Both Radiology and Nuclear Medicine Services are also in the process of specifically addressing policy issues that will be impacted by uniform workload reporting

Page 2 VHA Action Plan: OIG Draft Report: **Radiology and Nuclear Medicine Activities**

decisions. Work Groups have been formed within the individual Services to deal with anticipated policy ramifications.

<div align="center">
In Process   October 1, 1999 and Ongoing
</div>

Recommendation 2:

The Under Secretary for Health should take action to standardize staffing guidelines for Radiology and Nuclear Medicine Services

Concur

VHA has long been aware of the apparent lack of a clear correlation between reported workloads and staffing levels when comparative analyses among same-type facilities are conducted. We share OIG's concerns about what appear to be wide discrepancies when superficial statistical counts are compared. As the OIG has reported in other focused reviews, staffing variances exist not only in Radiology and Nuclear Medicine Services, but also in numerous other specialty areas. We, as well as many other healthcare provider organizations, have grappled for years with the complex process of trying to establish valid, universally-applicable staffing guidelines that take into consideration the innumerable variables that can impact an individual facility's staff needs. Thus far, however, it has been almost impossible to identify a single inviolable formula. This is true not just in the VA, but in all other areas of the healthcare sector, as well, as demonstrated by the availability of a variety of different guidelines that are being used by VA facilities for Radiology/Nuclear Medicine alone. Workload volumes and corresponding FTEE-measured staffing totals do not always present an accurate picture, given the varying service lines, products, case mixes, organizational arrangements, etc. Nevertheless, we continue to explore available options, including a "best practices" guideline for specific specialty areas that might provide a framework for staffing decisions.

Nuclear Medicine Service has also been working in close coordination with VHA's Health Services Research and Development (HSR&D) Service to create a statistically valid algorithm (using weighted workloads, productive FTEE, number of gamma cameras, etc.) to assist in identifying appropriate staffing levels. Similarly, Radiology Service has formed a work group to also develop an algorithm specific to their functional responsibilities. These attempts to establish reliable staffing guidelines

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are necessarily linked to the implementation of uniform workload reporting, since accurate workload counts will have to be converted into weighted workload units. Involved program offices, and the corresponding work groups, will coordinate these activities.

<div style="text-align:center">

In Process   January 2000 and Ongoing

</div>

Recommendation 3:

The Under Secretary for Health should:

a.   prescribe a compatibility standard for PACs and teleradiology equipment.

Concur

Significant progress has already been made in addressing this issue. VHA's Chief Information Office, in coordination with Diagnostic Services and the Acquisition and Materiel Management Service, has developed a standard interface protocol to assure equipment compatibility. The VistA Imaging Project has developed DICOM interface capabilities with PACs systems, image acquisition modalities (such as CT, MRI, ultrasound) and the VistA hospital information system. Project staff have defined a set of DICOM capabilities and implementation rules so that each manufacturer's equipment interfaces in the same way with the rest of VA's computerized healthcare environment. VHA has developed DICOM compliance statements for use in PACs procurements and has tested DICOM implementations with a number of PACs vendors. Test software has also been used by vendors prior to VA installations. In addition, VistA Project staff have reviewed vendor DICOM compliance statements for medical centers prior to purchase.

The National Acquisition Center (NAC) now serves as a centralized source of information about PACs purchases and required RFP contents. The NAC also enforces contract clauses when vendors do not deliver compatibility components. However, some medical facilities do not use the services provided by NAC. VHA will assess the potential advantages of requiring purchases of particular devices or systems to be first reviewed by NAC. As noted, inclusion of VA DICOM conformance statements in all proposed purchases of modalities and PACs systems is now required. We agree that all

Page 4   VHA Action Plan: OIG Draft Report: **Radiology and Nuclear Medicine Activities**

commercial PACs systems purchased by VHA must have a VistA interface in order for patient and study information to be electronically transferred to the PACs. A VHA Directive detailing these requirements will be issued by August 31, 1999. Design and distribution of this Directive will be coordinated by the Diagnostic Services SHG, in conjunction with the Chief Information Office.

A PACs/Teleradiology work group is also being convened by the Diagnostic Services SHG to develop detailed guidelines and policy recommendations for facility and VISN use in planning for and procuring PACs/Teleradiology systems. This group will initially convene in July 1999. Completion of field guidance is anticipated by December 31, 1999. The guidance will also be distributed to members of the Capital Investment Board (CIB) as a management tool in procurement decisionmaking.

                    In Process   August 31/December 31, 1999

b.   require that medical centers perform cost/benefit analyses before acquiring PACs.

Concur

During the period of OIG's review, DVA established the above-referenced Capital Investment Board to review all capital medical equipment planned procurements estimated at $1 million or more. The CIB is chaired by the Deputy Secretary of Veterans Affairs. Submissions to the CIB (which would include virtually all of the PACs procurements) must be accompanied by a cost/benefit analysis prior to purchase approval. The PACs/Teleradiology work group will include in their guidance a standardized format for the design and execution of cost/benefit analyses.

A policy that addresses need for cost/benefit analyses for equipment falling below the $1 million threshold is also in the process of being finalized by a task force composed of VHA field and Headquarters staff. The policy is expected to be issued by September 1, 1999 and will be incorporated into the Departmental Capital Planning Process review.

                    In Process   September 1, 1999

FULL TEXT OF UNDER SECRETARY
FOR HEALTH COMMENTS
(Continued)

Page 5   VHA Action Plan: OIG Draft Report: **Radiology and Nuclear Medicine Activities**

Recommendation 4.

The Under Secretary for Health should appoint a physician to fill the Program Director for Radiology Service position to provide guidance for field facilities in the form of standards and protocols.

Concur

Recruitment for a new Director, Radiology Service, has been authorized, and active recruitment efforts are underway.

                        In Process   August/September 1999

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MONETARY BENEFITS

IN ACCORDANCE WITH IG ACT AMENDMENTS

Report Title: Evaluation of Veterans Health Administration
Radiology and Nuclear Medicine Activities

Project No: 7R4-012

		OIG ESTIMATE		**AUDITEE ESTIMATE**	
Rec. No.	**Recommendation**	**Questioned Costs**	**Recommended Better Use of Funds**	**Questioned Costs**	**Recommended Better Use of Funds**
3.	Funds at Risk. Amount of funds that could be mis-spent if medical centers do not properly plan and coordinate acquisition of PACS equipment.	-0-	$114 Million	-0-	$114 Million
	TOTAL	-0-	$114 Million	-0-	$114 Million

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