FINAL REPORT
PROGRAM EVALUATION
OF PSAS

Department of Veterans Affairs

January 15, 2003

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EXECUTIVE SUMMARY

The Department of Veterans Affairs (VA) contracted Booz Allen Hamilton to conduct a program evaluation of the care and treatment provided to veterans who utilize Prosthetics and Sensory Aids Services (PSAS). Phase I of the Program Evaluation of PSAS was conducted in 1999 and focused on management and administrative policies; operational processes; quality management; and information management systems. Phase II, initiated in March 2001, evaluated the outcomes of care and treatment provided to patients who utilize PSAS, as well as the management aspects of several services.

This report provides a summary of each study conducted in Phase II. Detailed reports were developed and provided to the VA Office of Policy and Planning. Key findings of the studies are listed below.

- The VHA PACT Directive reflects the leading practices identified in literature findings by mandating that PACT Programs be interdisciplinary, proactively coordinate care, measure outcomes of care provided to PACT patients, and conduct annual evaluations.

- The study findings demonstrate that clinical strategies for risk reduction, such as foot screenings, nutrition consult, and smoking cessation counseling, are widely applied by VA staff.

- Findings indicate comparable discharge-to- community rates between VA and non-VA patient populations.

- The study data demonstrated that educational efforts are a high priority for VA.

- VA Medical Centers have inconsistently implemented the PACT Directive, which provides specific guidance on the care and treatment of veterans at-risk of limb loss or with amputations.

- Facilities that designated a dedicated staff member as the PACT Coordinator have a higher level of implementation of the PACT Program.

- The annual rate of amputation for at-risk VA patients during years 1997-2000 is approximately .5%.

- Initial amputation rates and re-amputation rates are higher in VAMCs with a highly implemented PACT Programs than VAMCs with partially implemented PACT Programs. One possibility for this finding is that high ranked PACT Programs serve as "magnets" for patients requiring highly sophisticated care and consequently serve a disproportionate number of severe cases.

- The additional analysis conducted on PACT ranked facilities show that highly implemented PACT Program facilities are more likely to be large, urban and academically affiliated, suggesting that these facilities care for patients with more severe illnesses.

- Many variables affected prediction of amputations, including having gangrene, an ulcer, a prior amputation, or having both PVD and DM.

- Veterans' functional status after amputation improved after discharge from VAMC facilities, though at a rate somewhat less than the non-VA sample population.

- VA efforts to assist veterans in restoring optimal function are comprehensive.

- Veterans report a high level of satisfaction with the care, devices and training provided to them by VA Medical Centers. Most satisfaction related survey questions resulted in 80-90% of veterans ranking their care, devices and training as excellent or good.

- Home oxygen services across the VA vary in the types of equipment and services contracted through vendors. Oversight and management practices for home oxygen contractors are also inconsistently applied.

- Most VA Orthotics and Prosthetic Laboratories do not meet all criteria for industry accreditation (only 5 out of 52 facilities are accredited), however many facilities would need only a few improvements to meet industry standards. Laboratories also have significant challenges in hiring and retaining qualified Orthotists and Prosthetists.

- VHA provides either computer readers or CCTVs to 97% of legally blind patients. 36% of legally blind patients in years 1998, 1999, and 2000 received a computer reader. Cost does not appear to limit access to computer reader technology, however long waiting times for admittance into computer access training may limit access.

- The high cost of cochlear implantation appears to limit veteran access to this technology, as well as general knowledge about this device, patient perceptions and travel to a cochlear implant center. Similar access issues exist in the private-sector.

- The provision of Automated Implantable Cardiac Defibrillators (AICDs) appears to be driven by medical need, not cost. VA Medical Centers follow Medicare and the American College of Cardiology criteria for utilizing this technology.

A detailed set of recommendations is provided in each study deliverable, however the most significant recommendations are outlined in this Final Report. Below is an overview of the key recommendations to assist VA in improving its programs and services.

- VA should develop an enhanced program of database education for its staff to increase the accuracy and comprehensiveness of its patient care data.

- VA should improve the oversight of the Home Oxygen program through several activities including improving quality management activities, developing a home oxygen contract template and conducting mock JCAHO surveys.

- VA should identify the Orthotic and Prosthetic Laboratories that are fully functioning and strive towards achieving facility accreditation or meeting accreditation standards.

- VA should create improved data systems for collecting information on individuals that are eligible and those that have received high cost assistive technologies or implants, such as computer readers for the blind, cochlear implants, and AICDs.

- VA should consider more fully evaluating the amputation and re-amputation rates in VAMCs with highly implemented and partially implemented PACT Programs.

- VA should reorganize the PACT Program organizational structure to focus on the preventive aspects of the program and appoint a National PACT Lead and National PACT Coordinator for Program oversight and coordination. The PACT Program should maintain a multidisciplinary team environment at the local and central level for making key decisions and for the delivery of healthcare services.

INTRODUCTION

In March 2001, the Department of Veterans Affairs (VA) contracted Booz Allen Hamilton (Booz Allen) to conduct a program evaluation of the care and treatment provided to veterans who utilize Prosthetics and Sensory Aids Services (PSAS). PSAS, at the medical center level, provides assistive technologies to veterans to improve functionality and quality of life. These items include durable medical equipment, prosthesis, orthotics, implants, eyeglasses, hearing aids, blind aids and other safety items and medical devices.

This program evaluation is in response to GPRA and congressional interest in VA's treatment of special disability populations regarding whether the VA is accomplishing its stated goals and objectives. The VA Office of Policy and Planning sponsored this study to conduct an objective third party assessment of the VA programs and services supporting special disability veterans. PSAS patients were chosen to represent special disability populations that utilize Veterans Health Administration (VHA) health care services.

The goal of the study was to evaluate the outcomes of care and treatment provided to the following patient populations.

Home Oxygen Services

–Home oxygen patients (COPD)

New Technology Utilization

–Legally blind
–Hearing impaired
–Patients eligible for Automated Cardiac Implantable Defibrillator (AICD)

Preservation-Amputation Care and Treatment (PACT) Program

–At-risk for amputation (Diabetes, PVD)
–Amputation treatment (lower extremity amputation)

Rehabilitation

-Motorized wheelchair users
-Amputation treatment (see above)

This program evaluation focused mainly on clinical outcomes, however management aspects (policies/processes) were also reviewed for specific programs:

-Orthotics and Prosthetics Laboratories,
-PACT Program, and
-Home Oxygen Services.

Booz Allen teamed with Northwestern University/Rehabilitation Institute of Chicago, Focused on Therapeutic Outcomes, Inc. (FOTO), and Convergent Healthcare to conduct this evaluation. This team of individuals brought expertise in program evaluation, performance measurement, rehabilitation outcomes, quality management, and clinical knowledge of rehabilitation services.

Program Evaluation Study Questions

The study questions for the program evaluation are listed below.

1. To what extent is VA achieving its program outcomes for patients requiring prosthetics based on a continuum of care?

2. What is the variability in contracts and services provided under contract regarding quality, standards of care, and inclusiveness of deliverables for home oxygen suppliers?

3. In the context of new technology utilization, how is VA making use of advances in prosthetics products and techniques?

4. What is the effect of Preservation/Amputation Care and Treatment (PACT) programs on the outcomes of patients?

5. Does the VA meet the same standards for Orthotic and Prosthetic labs as private industry?

The main study question in the overall program evaluation of PSAS evaluates “to what extent is VA achieving its program outcomes for patients requiring prosthetics based on a continuum of care?” This study question was used to guide the analysis of the at-risk for amputation population, patients with amputations, motorized wheelchair users, and home oxygen patients. The analyses focused on evaluating the following outcome areas: patients’ functional status, quality of life, satisfaction, and receipt of education, training and necessary activities of daily life (ADL) equipment and services. The study also reviewed patients’ access to primary care services.

Other study questions emphasized specific aspects of a VHA program or service. The home oxygen study focused on both the outcome measures listed above and a review of contracts for inconsistencies, standards of care, quality, and cost. The study on new technologies focused on reviewing three specific technologies for utilization and access: computer readers for the blind, cochlear implants, and AICDs. The PACT Program was reviewed for management and operations aspects, as well as clinical outcomes related to treating patients who fall under the PACT Program umbrella, which includes at-risk for amputation patients and patients who have had an amputation. In addition, Orthotics and Prosthetic Laboratories were reviewed for meeting established guidelines for industry accreditation and staff certification.

METHODOLOGY

The program evaluation methodology utilized to conduct this study involved the following steps: databases assessment, data collection, analysis and development of recommendations. The database assessment involved reviewing data dictionaries and reports from VA databases to determine the metrics that could be addressed with VA's current data. This assessment resulted in a refined project plan and analysis metrics for the program evaluation. The next step involved working with VA database managers to obtain data elements required for the study and to collect additional information through on-site visits to VA medical centers, telephone and face-to-face interviews, and administration of two internet surveys. The Booz Allen team utilized quantitative and qualitative techniques to analyze the data once it was obtained from VA databases and through data collection activities. Recommendations were then developed to improve VA's performance monitoring capabilities and program administration.

Specific analysis metrics related to each of the 5 study questions were initially developed by VA and were refined in the course of this study to best address the study questions based on existing VA data. Each of the populations in the program evaluation required different analysis metrics and techniques to evaluate functionality, receipt of health services and supplies, quality of life and satisfaction rates.

VA Databases

This evaluation was designed to utilize existing data from VA databases. A description of VA databases and how the databases were used to support this study is provided below.

Patient Treatment File (PTF) and Outpatient Care File (OPC)

Both PTF and OPC files collect nationwide data and are housed in the Austin Automation Center (AAC). The PTF contains patient demographic information, ICD-9 discharge diagnoses, ICD-9 procedures for each episode of care including dates of the procedure. The corresponding outpatient file collects data on each outpatient visit, but diagnoses have been collected for only the last few years. PTF and OPC were used in this study to obtain ICD-9 codes and demographic information to identify patient populations and perform risk adjustment. The Beneficiary Identification and Records Locator Subsystem (BIRLS) was used to track patient mortality.

External Peer Review Program (EPRP)

This program uses an outside contractor to measure prevention indicators and outcomes in VA patients through chart reviews. EPRP was used in this program evaluation to gather information on patient education and training, specialist referrals and clinical screenings.

Functional Status and Outcomes Database for Rehabilitation (FSOD)

FSOD incorporates data from the Functional Independence Measure (FIM) and other clinical assessment tools to track patient outcomes across the full continuum of rehabilitative care. The FIM ratings were used to measure functional status of the AK amputation population and the motorized wheelchair population. FIM ratings were not available for home oxygen patients since FIM is a rehabilitation clinical assessment tool and not administered to this population.

National Prosthetic Patient Database (NPPD)

The NPPD is a nationwide database that tracks prosthetics equipment, supplies and repairs, and corresponding data on volume and costs. It was used to determine ADL equipment provided at discharge, cost of equipment, and to assist in the identification of specific patient population groups.

Veterans SF36v (Short Form Functional Status Assessment for Veterans)

SF-36 is a primary measure of health-related quality of life. It measures eight concepts of health: physical functioning, role limitations due to physical problems, bodily pain, general health perceptions, energy/vitality, social functioning, role limitations due to emotional problems, and mental health. SF-36v/SF-36 was used to evaluate patient self-report of quality of life, functional abilities, and ability to participate in life situations.

National Prosthetic Patient Satisfaction Survey (NPPSS)

This survey, administered by the National Performance Feedback Center, collects information on the satisfaction levels of prosthetic patients. The NPPSS was used to assess veteran's satisfaction with the care, device training, and the device provided to them by VA.

Non-VA Databases

The evaluation team utilized several non-VA databases to obtain data for comparison to veterans' outcomes.

Uniform Data System for Medical Rehabilitation (UDSmr)

UDSmr maintains the largest database nationwide for medical rehabilitation facilities; its functional status measure, the FIM instrument, is also part of the VA's FSOD. Non-VA FIM data were obtained on lower extremity amputations for comparison with the VA patient population.

FOTO, Inc. Sample

The non-VA patient population obtained from FOTO, Inc. consisted of patients with above knee (AK), below knee (BK) or foot/ankle/toe amputations. Patients with quality of life data were selected for comparison to VA patients.

Data Limitations

The Booz Allen team experienced significant limitations with the VA data that should be taken into account when reviewing the findings presented in this report. The majority of these limitations stem from the use of existing VA data to perform this evaluation. The VA data and the databases were not designed to conduct a large scale, population based study, but rather to assist with the day-to-day hospital operations and the provision of clinical care. These data limitations are summarized at a high level below.

- Data fields changed over time within and across data sets
- Data were frequently incomplete
- Patients could not be identified as being treated at a VAMC that had a PACT Program
- Comparison non-VA samples were difficult to identify
- Multiple patient records with limited common variables exist for surgery files
- Inconsistent demographic variables existed in VA comparison data sets
- There was concern for general integrity of data analyzed
- Potential for sampling bias exists

Development of Study Databases

A 5-step approach was used to extract data from the PTF, OPC and NPPD databases.

Step One: Identified patients at risk for amputation by generating an "index" file of patients from 1997. These patients were followed through subsequent years (1998, 1999, 2000).

- Identified and extracted patients from 1997 OPC files whose first outpatient visits had ICD-9 diagnosis codes of diabetes mellitus (DM) or peripheral vascular disease (PVD)

- Extracted all records for this population by linking patients from diagnoses file to visit and procedures files in 1997

Step Two: Identify patients with prior amputations.

- From PTF and OPC for years 1997-2000, used the patient population from Step One to identify those who have undergone lower limb amputations

Step Three: Develop a "Master Diagnoses File" of patients who met ICD-9 diagnosis codes selected for various study populations for 1997-2000.

Step Four: Developed a "Master Procedure File" of patients who met ICD-9 procedure codes and CPT-4 procedure codes selected for various study populations for 1997-2000, and merged this file with the Master Diagnoses File to generate data for each target population.

Step Five: For patient populations specific to home oxygen and motorized wheelchairs, identified patients who received home oxygen equipment and motorized wheelchairs through NPPD, and link these patients to PTF to extract full patient records for years 1997-2000.

The project team also identified patients who have received an AICD, computer reader or cochlear implant through the NPPD. These patients were then matched with DSS for additional cost information.

Additional Data Collection

The Booz Allen team collected additional information for the evaluation through internet surveys, VAMC site visits, telephone interviews, and interviews with industry associations, leading practioners, and equipment manufacturers.

The Booz Allen team conducted two internet surveys using SurveyPro software to gain information on VAMC's current practices. SurveyPro is an internet web technology software that assists in the development and administration of an electronic questionnaire. Surveys were sent to individuals at VAMCs via e-mail, completed by VA staff and then stored on a secured web site. These surveys were conducted to gain information on Orthotic and Prosthetic Laboratories and the national implementation of the PACT Program.

Staff interviews during site visits to VAMCs resulted in information on operational issues, staff concerns, technology utilization, qualifications of referring staff, clinical practices, and quality management activities. Telephone interviews were also made to specific VAMC program offices to obtain additional information.

The evaluation team conducted many face-to-face and telephone interviews with industry associations, equipment manufacturers, and leading practioners regarding private sector practices, industry certification and accreditation standards, and other topics related to this evaluation.

HOME OXYGEN SERVICES

VA contracted with Booz Allen Hamilton to conduct a program evaluation of VA's home oxygen contracting practices, as well as studies related to the quality of life and patient satisfaction of patients who are discharged home with home oxygen services. Additionally, the time and distance traveled by home oxygen patients to primary care services were reviewed. A summary of each study is presented in this section.

HOME OXYGEN CONTRACTS STUDY

INTRODUCTION

The Booz Allen team reviewed home oxygen contracting practices across the VA to evaluate the variances in contract conditions and to determine the impact of these variances. VA is interested in the identification of leading practices in home oxygen contracting.

METHODOLOGY

The home oxygen contracts study employed a study methodology that addressed both variances in contract characteristics and differences in contract management and monitoring practices.

The BAH team reviewed 16 home oxygen contracts from medical centers across the country, using a comparison tool developed for this study. Contracts were reviewed to determine: contracting conditions; comprehensiveness and clarity of requirements; inclusion of industry-accepted requirements; and types of services provided. BAH also interviewed VHA staff via on-site visits and telephone conversations from 52 VA medical centers (VAMCs) on the content of their current home oxygen contracts and vendor monitoring practices. Since JCAHO's standards are the most widely utilized in the country, and since the VHA Directive specifically requires compliance to JCAHO standards, these standards were used to compare contracts and contract management practices to industry standards. The Booz Allen team also conducted site visits to seven VAMCs and interviewed representatives from Pulmonary, PSAS, Respiratory Therapy, and Acquisitions and Materiels Management.

The Booz Allen team performed a high-level evaluation of home oxygen costs across the sample of contracts and facilities interviewed. These figures were compared to the national average, based on aggregate cost data for the entire VA system. The total costs for home oxygen services for fiscal year 2001 were used to determine the national average.

FINDINGS

The findings from the contract review and interviews with VHA staff were collated to develop several conclusions. These conclusions have been grouped by the main objectives of the study.

Contract Characteristics

Most contracts covered more than one facility. However, a sizable portion of the contracts were facility-specific (16 out of 37).

The vast majority of separate and distinct contracts were reported as fixed price, which usually offers a sound method of protecting against VA financial risk (i.e., unexpected fluctuation) and limited administrative burden (i.e., cost per deliverable agreed upon at time of award).

The most common period of performance for the contracts evaluated was a base year plus three to four option years. This general structure occurred in almost every contract, with only slight variation in number of years. Only two instances of extension of existing contracts were identified.

The scope of services requested under the sample contracts reviewed generally fell into two categories: (1) those requiring equipment and oxygen only, and (2) those requiring equipment, oxygen, and related patient care services.

Contractual Variances in Quality Standards

At a minimum, all VA contracts reviewed require compliance with JCAHO standards, while most contracts specify that vendors must be JCAHO-accredited. Home oxygen vendors appear to be held accountable to JCAHO standards.

There was little consistency in the level of specificity related to vendor requirements among the various contracts reviewed. Contractual requirements related to initial delivery and set-up times vary greatly within the review sample.

Several of the contracts reviewed did not specifically require the vendor to have a policy on Advance Directives (a written statement completed by patients in advance of serious illness describing how they want medical decisions to be made). Although many contracts required vendor compliance to JCAHO standards, the contracts did not address the requirement that contractors discuss issues such as Do Not Resuscitate (DNR) options with patients.

Contractual Variances in Monitoring/Management

Multidisciplinary staff, including clinicians, administrators, and administrative staff fill the position of home oxygen coordinator. Based on the background of the person filling this position, the scope and responsibilities differ accordingly, resulting in variations in the role of the home oxygen program.

Quality Management/Performance Improvement activities exist but vary in the level of implementation and frequency. Compliance to VHA standards for monitoring and evaluation of the vendor and quality indicators for vendor performance are inconsistent among facilities

There is significant variation in the frequency of VA visits to patients' homes. The directive requires VA staff to conduct home visits to 15 home oxygen patients per year. The new requirement was established in September 2001. However, VHA staff do not report a consistent understanding of this new requirement.

Satisfaction surveys varied by method and frequency. A few sites do not have a formal process in place for complaint resolution and incident reporting. Several sites have a process but no system to track complaints/incidents on an aggregate level to identify trends.

Vendor documentation is reviewed but there are inconsistencies in the types of reports reviewed and the frequency of these reviews throughout the VHA.

Home Oxygen Costs

Average cost per patient per year for overall home oxygen contracted services was determined to be approximately $1,640, based on national PSAS data sources.

Individually reported average cost at the facility level showed a significant variance from facility to facility. Factors in cost variance may include: economic factors (uncontrollable by VHA — e.g., NYC has cost of living generally in excess of 200% greater than the average large American city); differences in type of contract and pricing structure; differences in vendor market availability (e.g., in rural sectors); and other similar factors. More detailed information on patient health status would be especially critical in understanding cost variances and their drivers.

Almost all of the sample contracts reviewed included a similar structure for their pricing schedules but with varying levels of clarity, organization, and detail. Pricing schedules were not always clearly linked with the SOW requirements and performance expectations.

RECOMMENDATIONS

The Booz Allen team developed several recommendations related to home oxygen contracting practices and contract management. The key recommendations are listed below.

1. Develop a Home Oxygen Contract Template

PSAS Strategic Healthcare Group should develop a contracting template for home oxygen, similar to that developed for Orthotic and Prosthetic Appliances, which includes all JCAHO requirements. This template may be used as a guideline, in which these requirements may not be altered but the level of service sought or other conditions may be individualized based on facility/VISN need or preference.

2. Conduct Periodic Mock JCAHO Surveys

VHA should validate internal compliance by conducting periodic unscheduled "mock JCAHO surveys," reviewing various aspects of the program. PSAS Strategic Healthcare Group at Central Office should arrange for staff to perform on-site visits or request electronically information that would verify compliance to home oxygen standards. Areas that should be reviewed include:

-Requirements in the Directive and Handbook,

-Documentation of visits to patient homes, vendor sites, truck and license inspections, and patient record reviews, and

-Documentation of meetings and teleconferences with the vendor, especially the meetings where QM/PI are discussed.

In addition to documentation reviews, such surveys should query staff (PSAS, respiratory, QM, Clinics, and Biomedical), vendors, and patients about processes for incident reporting/sentinel events, complaint resolution, and emergency preparedness. This exercise would not only ensure staff familiarity with internal and external requirements but also provide information about potential deficiencies against JCAHO standards.

3. Reevaluate the Requirement for Home Visits

VA should reevaluate the September 2001 Directive requiring 15 home visits per year to home oxygen patients. The Booz Allen team recommends that the home visit requirement be revised to reflect the great variation in the number of home oxygen patients at each medical center. VISN Prosthetic Representatives should work with VAMC PSAS Chiefs to identify the total number of home oxygen patients at each facility and establish the target for home visits for each year. VAMCs may choose to conduct more home visits than the established minimum standard. However, each VISN Prosthetic Representative should work with VAMC PSAS Chiefs to ensure that the minimum requirement is met annually.

4. Integrate Performance with Pricing Schedules

The Booz Allen team also recommends that VA integrate required contractor performance with pricing schedules. Contracts should provide greater integration of required performance with pricing schedule information to ensure that item costs and resulting services obtained under the contract are comprehensive and meet VA and patient expectations. Simplification of each contract's pricing structure would help facilitate this process, as would establishment of a clear link between the SOW and items or units defined on the pricing schedule.

PSAS PATIENTS DISCHARGED HOME WITH HOME OXYGEN

INTRODUCTION

The main PSAS Program Evaluation study questions evaluate "to what extent is VA achieving its program outcomes for patients requiring prosthetics based on a continuum of care?" This portion of the program evaluation concentrates on three specific study questions.

1. Do VA patients who have been discharged home receive home oxygen services and supplies at a rate comparable to non-VA patients?
2. Do these patients report a quality of life comparable to non-VA patients?
3. Are VA patients reporting satisfaction rates comparable to non-VA patients?

METHODOLOGY

The Booz Allen team performed this study utilizing several VA databases, as well as comparative non-VA data. An individual data file was developed for this study population by extracting patient records from VA's Patient Treatment File (PTF) and National Prosthetic Patient Database (NPPD) for the study years FY 1998 - 2000. Home oxygen users were identified by extracting records for patients diagnosed with Chronic Obstructive Pulmonary Disease (COPD) and matching with patients who had received home oxygen equipment. The study population file was merged with various other VA databases, depending on the type of data needed to respond to specific analysis metrics. For example, the National Prosthetic Patient Satisfaction Survey was used for information on veteran-reported patient satisfaction, while SF-36v data was used for self-reported quality of life data. EPRP data was used to determine level of counseling and patient education provided. The Booz Allen team utilized literature review findings to make comparisons to the non-VA population, as well as to provide general information on the utilization of home oxygen therapy.

FINDINGS

Major findings in this study correlate to the study questions posed by VA.

Do Home Oxygen patients report a quality of life comparable to non-VA patients?

Veterans report a lower quality of life, as evidenced by the data analysis of SF-36 survey results. The table below shows the association between SF-36 scales and general health for the VA population. Correlations of the same scales are included for the general US samples as a comparison. Refer to the study entitled "Patients Discharged to Home" dated November 22, 2002, for a complete description of the SF-36 scales and this finding.

Associations Between SF-36 Scales and General Health

SF-36 SCALES	VA SAMPLE n=994	GENERAL US SAMPLE n=2,474
Bodily Pain	.38	.58
Physical Functioning	.38	.69
Role Physical	.43	.69
Mental Health	.42	.49
Role Emotional	.32	.43
Vitality	.49	.65
Social Functioning	.54	.57

Values are presented as Pearson Product Correlation Coefficients

Comparisons between veteran and non-veteran populations should take into consideration the marked difference in health status, socio-economic factors and other applicable demographics between the two groups. Research findings support the premise that veterans have a poorer health status and greater number of medical conditions than the general population. Such differences should be considered when comparing factors such as utilization of health services, quality of life, and patient satisfaction between VA and non-VA populations.

What are the satisfaction rates for Home Oxygen patients?

Veterans report positive satisfaction rates related to home oxygen care and services. Of note is the finding that many patients perceive their home visits to be typically unscheduled and that patients report that they are unaware whether the person providing the home oxygen service is a VA employee or a contracted vendor.

The majority (89.5% and higher) of VA patients responding to the NPPSS reported satisfaction by choosing terms "good", "very good", or "excellent" when asked to evaluate the quality of devices, the quality of home visits, the quality of device-related care, the courtesy of the VA personnel, the courtesy of the oxygen company staff and oxygen's company response to patient issues with home oxygen care.

Patient satisfaction data cannot be compared across studies or populations unless all patients answer the same patient satisfaction survey. Therefore, VA data was not compared to a non-VA sample.

RECOMMENDATIONS

The Booz Allen team developed recommendations related to data collection, to promote future analyses on program and patient outcomes.

1. Improve Data Collection Processes and Information Systems

SF-36 surveys should be collected at appropriate times and change in reported functionality and quality of life monitored and addressed with individual patients. Recommended time frames for home oxygen patients is every six months.

VA should consider developing relational data files by collecting the same patient identifying demographic variables, e.g. social security number, in each electronic file. VA should standardize operational definitions of variables across the VA system.

2. Collect Health Status Data on Home Oxygen Patients

VA should collect health status data on its home oxygen patients to measure clinical outcomes and effectiveness of pulmonary rehabilitation, pharmacological interventions, and preventive initiatives such as smoking cessation education. VA's PSAS Strategic Healthcare Group should sponsor the adoption of an outcome measure tool to be utilized throughout VHA.

- Data should be collected annually from each VAMC, and reviewed by the Prosthetic Clinical Management work group focused on home oxygen.
- Data collected from this national effort will provide individual medical centers with information related to health status of their home oxygen patients, and will also provide VA with national data, which can be compared across the system and over time.
- The Booz Allen team identified a leading practice in collecting health status outcomes for home oxygen patients. The Miami VAMC is currently utilizing the St. George's Respiratory Questionnaire to track health status of its home oxygen patients. This questionnaire has been studied and proven to be a reliable, valid instrument for collecting health status of COPD patients. This tool can be used for discriminative and evaluative purposes.

TIME AND DISTANCE TRAVELED BY HOME OXYGEN PATIENTS

INTRODUCTION

VHA provides primary healthcare services to veterans at various types of facilities across the country. This study evaluates home oxygen users' access to primary care services. Specifically, this study reviewed the time and distance traveled by veterans receiving home oxygen services, to access care at VA facilities. There are three main study questions within this study.

1. Are VA prosthetic patients provided convenient, accessible care?
2. What is the travel distance from residence to point of care?
3. What is the travel time from residence to point of care?

This study does not include recommendations, as the primary focus of the study questions was to determine the current state of veteran access to primary care services.

METHODOLOGY

The Booz Allen team utilized several VA databases to determine primary care facilities, identify patients who utilize PSAS services, and determine the locations of both facilities and patient residence. The zip codes for patients' residences were matched to the closest VA facility providing primary care services to determine average distance and time traveled by patients. VA databases used in this effort include the VA Zip Code File, VA Station Tracking (VAST) database, Outpatient Clinic/Patient Treatment File (OPC/PTF), and the National Prosthetic Patient Database (NPPD). The study methodology resulted in a total of 7,621 home oxygen users.

The Booz Allen team also utilized Geographic Information Systems (GIS) to conduct spatial analyses to determine how far a patient travels to access primary care services from their residence. Spatially referenced information such as zip code point locations of patient residences and primary care service sites were layered together to analyze time and distance traveled.

FINDINGS

The national average distance/time and median distance/time traveled for urban area home oxygen patients receiving home oxygen is 6.2 miles or 31.2 minutes and 4.7 miles or 23.3 minutes, respectively. The national average distance/time and median for non-urban home oxygen patients is 21.9 miles or 32.8 minutes and 20.7 miles or 31.1 minutes, respectively.

Booz Allen analyzed each group of the patient population to determine the percent of patients who are within the Capital Asset Realignment for Enhanced Services (CARES) standards for access to care. CARES standards assume distance and travel times for access to care in urban, suburban, and rural areas. CARES standards assume equal distance and time standards for both suburban and rural areas, therefore in this study, only urban and non-urban standards are analyzed.

For home oxygen patients living in urban areas, 64 percent of patients meet the standard of 6 miles or 30 minutes for patients residing in urban areas and 20 miles or 30 minutes for patients in non-urban areas. The majority of home oxygen patients live two to four miles from a primary care facility. Of the 36 percent who are located beyond six miles of a primary care site, the majority of patients live within six to ten miles. In non-urban areas, 48 percent of patients are within the 20-mile standard. Those patients living in urban areas and are within six miles of the nearest VHA site travel on average 2.960 miles or 14.780 minutes.

MOTORIZED WHEELCHAIR PATIENTS

INTRODUCTION

VA strives to provide prosthetic equipment and services to assist patients with their activities of daily living (ADLs). These services and devices are administratively provided and managed by the Prosthetics and Sensory Aids Services (PSAS) service line within VHA. The provision of motorized wheelchairs may significantly impact the quality of life reported by VA patients. As part of Booz Allen Hamilton's Program Evaluation of VA's PSAS, the Booz Allen team evaluated the prosthetic services provided to certain veterans discharged to home. In addition to the types of services provided, VA tasked Booz Allen with evaluating the quality of life and patient satisfaction of motorized wheelchair users.

VA developed specific study questions that apply to the motorized wheelchair study population.

1. Do VA patients who have been discharged to the home receive health care services and supplies at a rate comparable to non-VA patients?
2. Do these patients report a quality of life comparable to non-VA patients?

METHODOLOGY

The Booz Allen team customized the motorized wheelchair study population by merging different VA databases. Veterans were identified who had received a motorized wheelchair during fiscal years 1998 through 2000 by extracting records from the NPPD. Wheelchair user records were extracted from NPPD using codes E1080-E1082, E1210-E1213, K 0010-K0014. Patient identification numbers from this subset were used to match patients' records among other VA databases. Clinical records were then obtained for the motorized wheelchair subset by extracting their records from VA's inpatient and outpatient treatment files.

These files provided pertinent demographic and clinical information. This merged set of data served as the study population for motorized wheelchair users. For analyses on functionality, the motorized wheelchair subset was merged with matched patients from the Functional Status Outcome Database (FSOD) to extract the Functional Independence Measure (FIM) ratings. Data from the SF-36 survey for both veteran (SF-36v) and non-veteran (SF-36) populations were used to answer study questions related to quality of life and ability to participate in life situations. The analysis on training and education required the extraction of data from two sources: EPRP and NPPSS.

VA collaborated with the Booz Allen team to develop and refine metrics for this study:

- What VISN/VAMC guidelines exist regarding the qualifications of individuals making referrals for VA patients?
- What ADL equipment was provided at discharge?
- Was education provided to VA patient and patient's family?
- What are the patient functionality scores before and after treatment, when age and risk adjusted?
- How do VA patients (in each study population) rate their quality of life?
- How do VA patients rate their ability to participate in life situations?
- What are the wait times that VA patients with motorized wheelchairs experience for clinic appointments?
- How long do patients with motorized wheelchairs wait to see a provider?
- How far do VA patients with motorized wheelchairs travel to clinic appointments?
- For patients with motorized wheelchairs, what is the satisfaction rate with home health services or products specific to that study group?
- What are the areas of customer concern?

FINDINGS

Although the findings indicate that referrals for a motorized wheelchair may generate from any number of disciplines, the majority of medical centers convened focused committees dedicated to the evaluation of patients for motorized wheelchairs.

A comparable non-VA sample for data related to the distribution of ADL equipment could not be identified, therefore VA data was analyzed to identify equipment provided to veterans. The analysis indicates that VA patients received a wide variety of equipment, including wheelchairs, crutches and walkers, special home safety (bath and toilet) items, as well as many other ADL item such as dressing aids and long handle reachers.

Overall, patients received training and education on the use and maintenance of their equipment. Findings support the conclusion that veterans within this study population received training on the use of their prosthetic devices.

The Booz Allen team analyzed the functional status of motorized wheelchair users before and after rehabilitation treatment. Data analysis indicates that most VA patients exhibited considerable gains in functionality at discharge when compared to admission. This analysis finding suggests that the rehabilitation treatment provided to patients resulted in significant improvement of functionality.

The quality of life was perceived as low among VA motorized wheelchair users in the study population. These analysis questions concern quantification of patients' *perception* of their quality of life and their *actual ability* to participate in life situations while using motorized wheelchairs. There are no data in the VA data sets that allow

direct assessment of either quality of life or life situation participation. SF-36v data was used to compare results of the study population to norms in the general population. Descriptive statistics were used to estimate the patient's ability to function, estimate their quality of life, and imply their participation in life situations for each of the eight SF-36 constructs.

According to analysis of the records, which matched between the study population and the SF-36 dataset, veterans report low functional capacity with more dysfunction in physical compared to mental functioning. The quality of life was perceived as low in the VA population of people using motorized wheelchairs. There is no comparable non-VA sample, as SF-36 physical functioning and role physical scales were not designed for this patient population.

At least 50% of motorized wheelchair patients reported that they do wait longer than 10 minutes to be seen. According to analysis findings detailed in the Booz Allen Hamilton PSAS Program Evaluation's Time and Distance Study, the total number of patients within the motorized wheelchair user subset (n=4,117) traveled an average 13.975 miles to primary care clinics.

Patient satisfaction data cannot be compared across studies or populations unless all patients answer the same patient satisfaction survey. Therefore, VA data was not compared to a non-VA sample. Based on the analysis of VA data, 90% of patients rate the quality of their device and quality of their visits as excellent, very good or good.

RECOMMENDATIONS

The following recommendations could improve data collection related to patients with motorized wheelchairs.

1. Improve Data Collection Processes and Information Systems

VA should improve data collection processes, so FIM and SF-36 surveys are collected at appropriate times before, after and during rehabilitation. Recommended time frames are:

a. Annually during medical management of patients, or
b. Six months during rehabilitation until patient is independent.

VA should develop relational data files by collecting the same patient identifying demographic variables, e.g. social security number, in each electronic file. In addition, VA should standardize operational definitions of variables across the VA system.

NEW TECHNOLOGY

The New Technology Study focused on reviewing three specific technologies to determine veterans' access to new, high-cost technology: computer readers for the blind, cochlear implants, and AICDs. Each of these technologies required a slightly different study methodology. Therefore, the methodology, findings and recommendations are presented separately for these technologies.

COMPUTERS READERS FOR THE BLIND

INTRODUCTION

VA is interested in understanding the rate of access veterans have to computer reader technology. VA is also interested in identifying those factors that may impact veteran access to these items in both VA and non-VA populations. VA tasked Booz Allen Hamilton to answer the following two questions:

1. Do veterans have a rate of access to computer readers commensurate with that of the private sector?
2. What is the rate of utilization by veterans for computer readers, and what factors impact utilization?

METHODOLOGY

Booz Allen Hamilton conducted a literature review that focused on the following areas:

- Prevalence of legal blindness in the general population, when stratified by age,
- Availability and utilization of computer reader technology in the general population, and
- Eligibility criteria for provision of computer readers in the general population.

The Booz Allen team also contacted VHA representatives to obtain their perspectives on veterans' access to computer readers and to determine VHA's eligibility criteria for computer readers. The team analyzed VHA data from the PTF/OPC and NPPD databases for the fiscal years of 1998, 1999, and 2000 to determine the following:

- What percentage of the population met the eligibility criteria?
- What percentage of the eligible population received a computer reader from the VA?
- What was the utilization rate for computer readers and Closed Circuit Televisions (CCTVs)? (The Booz Allen team added CCTVs as an item for

review since many legally blind patients request a CCTV instead of, or in addition to, a computer reader. A CCTV also assists legally blind patients in understanding written material.)

- Did these utilization rates vary when measured at VISN or facility levels?
- Did issues such as cost, eligibility requirements, or proximity to a Blind Rehabilitation Center affect access to obtaining a computer reader?

In addition, the Booz Allen team compared veterans' access to computer readers to that of the non-veteran population. Booz Allen also conducted numerous interviews with Blind Rehabilitation Center (BRC) staff members and coordinators of the Visual Impairment Services Teams (VIST).

FINDINGS

VA provides two specific types of computer reader technology: self-contained computer readers and the personal computer model. These are similar in cost and utility but require two distinct types of user training. The personal computer type of computer reader requires attendance at computer access training (CAT) and a demonstration of computer proficiency before the equipment is provided to the veteran. The most frequently requested assistive technology is the CCTV.

The level of outreach activity of VIST coordinators varies greatly from one VAMC to another. This level of outreach impacts the numbers of veterans referred for CAT. Variations in VIST coordinator levels of outreach may be due to disparities in workload and size of VISTs at VAMCs.

Most VIST coordinators across the country report that they use criteria that appear to be relatively similar. The criteria are as follows:

- A diagnosis of legal blindness,
- The ability to touch type,
- Sufficient cognitive ability, and
- Reasonable need for a computer reader.

However, the VIST coordinators appear to apply these criteria differently across the country, resulting in a lack of equivalence or standardization.

VA staff report that the waiting lists and waiting times for CAT continue to grow, as the number of blind veterans increases and more veterans show interest in CAT. The average waiting time for admittance into a CAT program is 10 months. Interviews with BRC staff indicate that there is a shortage of CAT trainers at the VAMCs and that many BRCs are not fully staffed. Staff members indicated that these factors contribute to longer waiting times before blind veterans to receive computer readers.

Data from fiscal years 1998, 1999, and 2000 indicate that VA provides a significant amount of computer readers to veterans - 36% of all legally blind veterans received a computer reader during this time period. Approximately 97% of all legally blind veterans received either a computer reader and/or a CCTV from the VA. Based on interviews with BRC staff, approximately 85% of legally blind veterans choose a CCTV instead of, or in addition to, a computer reader package. This study only evaluated items received during years 1998, 1999, and 2000, which does not account for items that were received before or after the study period.

Literature review and research of private and public sector practices indicate that the majority of computer reader technology provided to blind individuals is related to vocational training. Most other computer training for the blind is associated with a fee. Actual percentage rates of utilization of computer reader technology are not available. Research indicates that VA is unique in its service offering of computer reader technology to all legally blind patients who demonstrate interest in, and capability for, computer access training.

Analysis of VISN and VAMC data showed that over 50% of the legally blind veterans in VISNs 16, 18, 19, and 22 received computer reader technology. These VISNs did not necessarily provide the computer reader technology, but the VIST coordinators at the VISNs facilitated the provision of computer reader technology to their veterans. VAMCs at Palo Alto, Tucson, Hines, Birmingham and West Haven were the top five facilities in distributing the greatest number of computer readers. All five facilities operate BRCs. Cost does not appear to impact the provision of computer reader technology. The length of the BRC's wait list and the waiting time to begin CAT may impact the rate of provision.

RECOMMENDATIONS

1. Collect Volume and Cost Data for CAT

VA should consider reviewing its data collection efforts in the area of blind rehabilitation, and should begin collecting volume and cost information specifically related to CAT.

2. Evaluate the Effectiveness of VA Provided CAT

VA should consider conducting an evaluation to determine the effectiveness of providing inpatient CAT as compared to outsourcing this training. Such an effort might decrease the barriers to CAT access created by long waiting times and lengthy waiting lists.

3. Review Staffing Levels

VA should consider a review of staffing levels within VIST to determine the relationship between differences in staffing levels and veteran access to computer reader technology.

4. Finalize Guidelines for BRC Practices

VA's Blind Rehabilitation Service should evaluate and finalize the guidelines collated from various BRC practices. Concurrent with this effort, the VA should establish strict eligibility criteria to equalize veteran's access to technology at a national level. Additionally, the VA should incorporate national guidelines related to priority levels to make access uniform across the VA.

5. Improve Targeted Outreach to Blind Veterans

VA Central Office should consider providing each VISN with reports of names and addresses of blind veterans. These reports could be generated through the Patient Treatment File (PTF)/ Outpatient File (OPC) or from VBA listing of veterans receiving disability compensation for blindness . VISNs may use such reports to conduct targeted outreach to blind veterans, in an effort to disseminate information related to blind rehabilitation services and computer reader technology.

TIME AND DISTANCE TRAVELED BY LEGALLY BLIND VETERANS

INTRODUCTION

VHA provides primary healthcare services to veterans at various types of facilities across the country. This study evaluates the time and distance traveled by legally blind veterans to primary care services. There are three main study questions within this study.

1. Are VA prosthetic patients provided convenient, accessible care?
2. What is the travel distance from residence to point of care?
3. What is the travel time from residence to point of care?

This study does not include recommendations, as the primary focus of the study questions was to determine the current state of veteran access to primary care services.

METHODOLOGY

The Booz Allen team utilized several VA databases to determine primary care facilities, identify patients who utilize PSAS services, and determine the locations of both facilities and patient residence. The zip codes for patients' residences were matched to the

closest VA facility providing primary care services to determine average distance and time traveled by patients. VA databases used in this effort include the VA Zip Code File, VA Station Tracking (VAST) database, Outpatient Clinic/Patient Treatment File (OPC/PTF), and the National Prosthetic Patient Database (NPPD). The study methodology resulted in a total of 7,387 legally blind veterans.

FINDINGS

The national average distance and time traveled by legally blind patients in an urban setting is 6.3 miles or 31.4 minutes. The national average distance and time for non-urban legally blind patients is 22.4 miles or 33.6 minutes.

Booz Allen analyzed each group of the patient population to determine the percent of patients who are within the CARES standards for access to care. CARES standards assume distance and travel times for access to care in urban, suburban, and rural areas. CARES standards assume equal distance and time standards for both suburban and rural areas, therefore in this study, only urban and rural standards are analyzed. Moreover, this analysis compares urban and rural standards against the urban and non-urban zip code areas of the patient population and VHA sites.

For legally blind patients living in urban areas, 62 percent of patients meet the standard, with the majority living two to four miles from a primary care facility. Of the 38 percent who are located beyond six miles of a primary care site, the majority of patients live within six to ten miles. In non-urban areas, 49 percent of patients are within the 20-mile standard, with 22 percent living 10 to 20 miles from the nearest VHA primary care facility. Of the 51 percent who are located beyond 20 miles of a primary care site, the majority of patients live within 30 to 60 miles. Those patients living in urban areas and are within six miles of the nearest VHA site travel on average 2.9 miles or 14.7 minutes.

COCHLEAR IMPLANTS

INTRODUCTION

A cochlear implant is a surgically implanted auditory device that stimulates the cochlear (hearing) nerve electronically to provide a hearing impaired person with the necessary auditory sensation to perceive sound electronically. A cochlear implant allows the hearing impaired to become aware of speech and environmental sounds and enables communication though spoken language. It restores partial hearing to people who suffer from severe hearing impairment and who have no useful response to use of hearing aids. Cochlear implantation is considered a high cost, new technology procedure. VA is interested in determining the rate of access that veterans have to cochlear implantation. VA is also interested in the identification of potential barriers to access and eligibility requirements for cochlear implantation.

METHODOLOGY

The Booz Allen team obtained and analyzed data on the number of cochlear implantations performed in VA by accessing the NPPD and PTF/OPC for fiscal years 1998, 1999, and 2000. Booz Allen conducted site visits at seven VAMCs and met with audiologists at each of these facilities. The team also conducted telephone interviews with staff members at each of the VA's ten cochlear implantation centers and with an audiologist from each VISN. These interviews insured adequate geographical representation of the findings. Literature reviews and several interviews with industry representatives were also performed to determine the incidence of severe to profound hearing impairment and utilization of cochlear implant technology in the non-VA population.

The methodology for estimating the percentage of the veteran population who would benefit from cochlear implantation included several limitations. The term "hearing impairment" encompasses a broad range of hearing deficits and audiologic conditions. Researchers have defined this term differently, and prevalence rates vary greatly. An individual veteran's medical status and ability to undergo cochlear implant surgery, if indicated, could not be ascertained from the available data and resources. Co-existing benefits from the use of a conventional hearing aid could not be ascertained from the available data. Booz Allen employed the following definition and prevalence rate of deafness, taken from a study conducted by Holt et al. This study defines deafness as "At best, can hear and understand words shouted in the better ear". Booz Allen applied this standard and its estimated prevalence to the enrolled veteran population.

FINDINGS

Due to the lack of standardized levels of hearing impairment, definitive data are lacking on the prevalence and demographics of specific levels of hearing impairment. Consequently, the number of people in the U.S. with "severe to profound" hearing impairment is merely an estimate, and this estimate is between 464,000 and 738,000.

Cochlear implants are becoming the treatment of choice for people with severe to profound hearing loss. Cochlear implants have improved the overall quality of life for many individuals who suffer from severe to profound hearing loss. However, fewer than 23,000 implants have been performed in the U.S., a small fraction of the eligible population. The low utilization of this technology may be due to the high cost of surgery, low insurance reimbursement and lack of access to centers that perform the surgery. Co-morbidities among the hearing impaired may also contribute to their lack of access to cochlear implant surgery.

Booz Allen addressed the question of determining the percentage of VA patients who would benefit from cochlear implants. Eligibility for implantation is based on hearing tests, speech capability and contraindications to surgery, such as cochlear nerve disease and poor general health. However, due to highly variable clinical presentations,

estimates of the number of potential candidates are imprecise. The prevalence rate of "deafness" as defined in the literature review in the general population for people aged 45-64 years and over the age of 65 was applied to the total number of enrolled veterans. An estimate of the number of veterans in these age groups who may be considered a candidate for a cochlear implant during 1999 and 2000 is provided below.

YEAR	AGE GROUP	ESTIMATED # OF VETERANS WITH SEVERE TO PROFOUND HEARING IMPAIRMENT	ESTIMATED RANGE OF CANDIDATES FOR CI*
1999	45-64 years	5,779	578 – 1,445
1999	> 65 years	34,470	3,447 – 8,617
2000	45-64 years	6,230	623 – 1,558
2000	> 65 years	39,342	3,934 – 9,836

*10-25% of severe-profoundly hearing impaired

There are data discrepancies in the number of implantations performed by the VA. Utilization information is provided for cochlear implant procedures as supplied by the Audiology staff at the ten VA Cochlear Implant Centers, in addition to the data gleaned from the various databases.

CIC SITE	TOTAL VOLUME FROM CIC CHIEFS	TOTAL VOLUME FROM DATA ANALYSIS	DIFFERENCE IN VOLUME
Ann Arbor	12	9	- 3
Atlanta	10	5	- 5
Birmingham	10	8	- 2
Houston	6	6	0
Iowa City	9	6	- 3
Long Beach	18	19	+ 1
Miami	6	5	- 1
New York	7	2	- 5
Pittsburgh	5	3	- 2
Seattle	13	12	- 1
TOTAL	***96***	***75****	***-21***

Data revealed that 68% of all cochlear implants were provided to veterans who have a cochlear implant center (CIC) at their local VAMC, while 32% traveled to a CIC that was not at their "home station". The majority of cochlear implantations performed at VA CICs are performed on local veterans. While some patients come from outside the VAMCs' catchment areas, very few are patients from outside of the CIC's VISN. VISNs 22, 5 and 20 had the most patents who received cochlear implants during the 3-year review period.

Booz Allen addressed the question of determining if cost affected the availability of cochlear implants provided to veterans. During onsite visits and telephone interviews, VA staff reported possible access constraints due to cost and budgeting. Audiology staff at various VAMCs reported concerns with funding for cochlear implant surgery. Three of the ten cochlear implant centers reported restrictions on the number of implantations they can perform per year. Some sites reported increased referrals for cochlear implants from centers that are unable to accept new patients for implantation surgery. Travel to implantation centers can be a significant obstacle to surgery according to VA Audiology and Speech Pathology representatives.

Clinicians appear to make individual patient specific decision on referral and implantation. Restrictions on the number of implantation procedure seem to be based on local medical center policy.

Booz Allen estimates the rate of provision in the general population to be 4.6%; the estimate for the VA is less than 1%. The Booz Allen team believes that these rates are not comparable due to deficiencies in the data for both VA and the general population. Specifically, Booz Allen could not determine the criteria that defined eligibility for the general population. Booz Allen also could not determine the demographic composition of the eligible general population group in order to compare it demographically with the veteran population.

RECOMMENDATIONS

1. Improve Data Reporting Systems for Cochlear Implants

VA should consider an in-depth analysis of the data reporting systems that capture clinical procedures such as cochlear implantation. VA should validate the systems in place, identify gaps in the reporting of services and procedures, and resolve discrepancies between data captured in databases and data collected by Audiology and Surgery.

2. Broaden Cochlear Implant Education Efforts

VA should continue educational efforts targeting Audiologists and the VA medical community to promote awareness and training in cochlear implantation technology and identification of potential candidates.

AUTOMATED IMPLANTABLE CARDIAC DEFIBRILLATOR

INTRODUCTION

An automated implantable cardiac defibrillator (AICD) is a small, lightweight electronic device that is surgically implanted to regulate heart rhythm. During the twenty years that AICDs have been in use, they have proved highly effective in aborting life threatening cardiac rhythms and in restoring normal cardiac rhythms. Research has shown that AICDs increase life expectancy when implanted in properly selected patients. Consequently, many clinicians now believe that AICDs are the treatment of choice for those patients who are at high risk for sudden death from dangerous heart rhythms.

METHODOLOGY

Booz Allen conducted a literature review to explore the use of AICDs in the general population. In collaboration with the Program Chief for Cardiovascular Diseases at VA Central Office, Booz Allen developed a methodology to compare utilization of AICD implantation in VA to that in the general population. This methodology defined the "eligible" population that may benefit from AICD implantation by utilizing the same clinical criteria that Medicare and VA utilize. This method provided an estimate of the number of patients who might benefit from an AICD. Booz Allen compared the number of patients who had received an AICD during fiscal years 1998, 1999 and 2000 with the number of patients who could benefit from an AICD and provided an estimate of the rate of utilization for AICDs within the VA. In addition to the literature review and data analysis, the Booz Allen team spoke with various representatives from PSAS, Cardiology and Electrophysiology services through site visits and telephone interviews.

FINDINGS

VA has not yet established formal guidelines for AICD candidacy, but its informal criteria closely follow those of Medicare, the American College of Cardiology and the FDA. However, the actual decision of whether to implant an AICD is based on clinical criteria, rather than formal guidelines. Veterans may sometimes receive an AICD from non-VA providers when clinically necessary. Staff members did report that travel requirements might deter some veterans from seeking an AICD.

Booz Allen addressed the question of determining the percentage of VA patients who received AICDs compared with those who would benefit from them. Data were analyzed for fiscal years 1998 to 2000. Since Booz Allen utilized Medicare approved diagnosis codes, the number of individuals in the candidate population may be overstated. Without detailed expert examination of each individual record, it is not possible to differentiate the true candidates from those persons who merely share a common diagnosis. The table below displays the results of this analysis.

Year	Eligible Veterans	AICDs Implanted	% Who Received An AICD
1998	26,990	753	2.8%
1999	28,163	740	2.6%
2000	32,070	899	2.8%
Total	87,223	2,392	2.7%

Since the eligible population may be overstated, the rate of AICD receipt, approximately 2.7%, may be understated.

Analysis revealed that each of the 21 VISNs provided veterans with AICDs. VISN 16 provided the greatest number of implants, especially at VAMCs in Houston, TX and Little Rock, AK. VISN 11 provided the next highest volume, and VISN 2 provided the fewest.

During interviews, several staff members stated that cost does not appear to play a role in the decision making process. If a medical center does not have the capability to implant a patient, veterans are referred to other VA medical centers. If the distance is too great or the patient cannot tolerate the travel, the veteran may be referred to non-VA providers, and the procedure is paid for using fee basis.

RECOMMENDATIONS

1. Conduct Data Integrity Reviews

VA should conduct data integrity reviews of clinical databases to ensure accurate recording of AICD procedures and implantations.

2. Conduct Further Research on AICDs

VA should evaluate the efficacy of AICDs in decreasing the number of sudden cardiac deaths among VA patients.

3. Establish Formal Guidelines for AICD Candidacy

VA should establish formal guidelines for AICD candidacy to standardize the selection of candidates across the VHA system. These formal guidelines should incorporate published guidelines that are currently followed by VA, including those established by the American College of Cardiology, the North American Society of Pacing Electrophysiology and Medicare.

ORTHOTIC AND PROSTHETIC LABORATORY STANDARDS

INTRODUCTION

Booz Allen Hamilton was asked to review industry standards of credentialing and accreditation of Orthotic and Prosthetic providers and facilities and to determine how VA laboratories compared with industry standards. To do so, the Booz Allen team met with representatives of the two national accrediting bodies, gathered information through literature review, conducted interviews at site visits and utilized an Internet survey developed specifically for this study.

Booz Allen was tasked to answer the following questions:

1. What standards does the VA set for its O&P laboratories?
2. What industry certification and education standards does the VA require of its contracted laboratories?
3. What are the established industry standards for certification of providers and accreditation of facilities?
4. To what extent do VA O&P laboratories meet industry standards?

METHODOLOGY

Booz Allen reviewed relevant literature and conducted on-site interviews at seven different locations to determine standards for both the Orthotic/Prosthetic provider and the Orthotic/Prosthetic facility. An internet survey was conducted to determine which VAMCs have internal O&P labs and which internal O&P labs are fully functional. Standards from the two American certifying bodies were used to determine which labs met accreditation standards and which lab staffs met certification standards.

FINDINGS

Current VA efforts to collect information on patient satisfaction do not specifically address topics relevant to orthotics and prosthetics. The National Prosthetic Patient Satisfaction Survey (NPPSS) questions apply only in a limited fashion to service provided in O&P labs.

Because VA lacks a dedicated O&P survey, VA does not presently satisfy a requirement of the two American accrediting bodies. The information collected by VA does not specify if a contractor laboratory or an internal VA laboratory provided the care, and it is often difficult to determine if survey results refer to a contract provider or a VA staff provider. Also, aggregate survey information is not returned to the treating labs, and it is possible that opportunities suggested by patient feedback for enhancement of the scope and quality of lab services are missed.

VA is facing a serious challenge in recruiting and retaining Orthotists and Prosthetists. A significant number of present VA staff Orthotists and Prosthetists report having over 20 years of experience. Such individuals are often "senior-level", and many may retire during the next several years.

VA salaries are not competitive with those in private industry. VA job descriptions for Orthotist/ Prosthetist do not distinguish the clinical roles of such staff, which may confuse potential qualified employees. Different VAMCs offer different grade levels for the same Orthotist/Prosthetist positions, confusing some applicants, and funding for continuing education is not consistent among the VAMCs. Finally, the majority of VA O&P labs are not accredited, and certified staff members prefer to work at accredited labs. These issues pose challenges to VA in its efforts to recruit qualified new staff.

The working environment for O&P staff is changing to the VA's disadvantage. State licensing standards are becoming stricter, often mimicking those of the American certifying bodies. Health insurance payers are also adopting stricter "qualified provider" standards, also based on the industry certifying bodies. These trends toward stricter standards imply that VA O&P labs will become increasingly sub-standard. VA does employ a stricter level of standards, but it applies these stricter standards to contract labs, not to its own internal VA O&P labs.

The VA's O&P labs offer varying levels of patient service and have inconsistent alignments with other VA clinical services. Some VA orthotic and prosthetic labs, despite their names, do not provide a full range of orthotic and prosthetic products and services. Conversely, some "orthotic labs" actually provide prosthetic services in addition to their orthotic offerings.

Product and service offerings at VA O&P labs are often not aligned with clinical parameters. Some O& P labs provide clinical care but are not aligned with any clinical service of the VAMC. Other O&P labs lack clinical infrastructure guidelines regarding standards, competencies and quality measures. Clinical standards for Orthotists and Prosthetists are lacking at some VA O&P labs. VA laboratories also have a confusing array of non-standardized job titles.

RECOMMENDATIONS

The Booz Allen team developed recommendations, based on the various findings, to assist VA in raising the standards for O&P services provided in VA laboratories. Mandatory facility accreditation of all O&P Labs will serve to validate the quality of services provided to veterans; recommendations have been developed to assist VA in obtaining facility accreditation. Recommendations focus on efforts that address key standards that affect facility accreditation.

1. Customize Patient Satisfaction Surveys to Include O&P Services

Central Office should add specific questions related to O&P services to the National Prosthetic Patient Satisfaction Survey and ensure that results are provided to individual facilities in a timely manner, to assist in improvement efforts.

Central Office may also consider developing a dedicated O&P patient satisfaction survey instrument, for individual VA Medical Centers to administer, either in lieu of or in addition to the NPPSS.

2. Develop Quality Improvement Plans in O&P Laboratories

VAMCs should develop a formal quality improvement plan specifically for the O&P lab.

3. Continue Use of Contract Template

PSAS should continue to use the VA contract templates for Orthotic appliances and artificial limbs, as the contractual requirements include industry standards.

4. Improve Efforts to Recruit and Retain Qualified Staff

VA should focus on recruitment and retention of certified staff, to ensure that each VA O&P lab has at least one certified staff member supervising O&P care.

5. Develop Clinical Standards for O&P

PSAS should develop clinical standards of care for the provision of O&P services.

PACT PROGRAM PATIENT POPULATIONS

This section of the report summarizes the purpose, methodology, findings and recommendations of the study conducted on the PACT Program and the patients that fall under the PACT Program guidelines. The section is broken into four segments — PACT Program, At-Risk for Amputation, Amputation Treatment, and recommendations for these three studies.

PACT PROGRAM

INTRODUCTION

The Veteran's Health Administration established the PACT Program to provide a coordinated effort within medical centers to treat patients at risk for limb loss and those who have had an amputation. According to VHA PACT DIRECTIVE 2001-030, PACT "represents a model of care developed to prevent or delay amputation through proactive early identification of patients who are at risk for limb loss."

To assist each VAMC in establishing a PACT Program at its facility, VHA developed and distributed the PACT Directive, which provides specific guidance on the care and treatment of veteran patients at-risk of limb loss or with amputations. It is VHA policy that the PACT Program be established at all VAMCs. The PACT Program provides a model of at-risk limb care that incorporates interdisciplinary coordination of surgeon, rehabilitation physician, therapist, nurse, podiatrist, social worker and primary care, medical, diabetes team and prosthetic and/or orthotic personnel. The Program was designed to track every patient with an amputation and those at-risk of limb loss, from day of entry into the VA health care system, through all appropriate care levels, back into the community.

VA asked the Booz Allen team to evaluate whether VAMCs with an official PACT Program have different outcomes than VAMCs without a PACT Program. The results of this effort will provide VA with information on the level of implementation of the PACT Directive at each VAMC.

METHODOLOGY

To answer the study question that VA asked Booz Allen to investigate, individual medical centers with and without a PACT Program needed to be identified. The VA project team and the Booz Allen team could not determine from VA sources those VAMCs with an official PACT Program because the Program was implemented differently across the country. In response to this limitation, the Booz Allen team created a VAMC Internet survey to determine how each facility implemented the criteria outlined in the PACT Directive. The survey was designed to address the following research questions.

- To what extent has each VA facility adopted the PACT Directive?
- Which services and disciplines are involved in the treatment of patients at-risk for amputation and patients with prior amputations?
- Which service and discipline primarily coordinates the care of the patients at-risk for amputation and patients with prior amputations across the continuum?
- Are clinical guidelines used in the treatment of patients at-risk for amputation and patients who have had amputations? What areas are covered in these guidelines?

The Chief of Staff at 140 VAMCs were sent an internet survey to complete. The survey resulted in a very high response rate (82.1%). Facilities that did not receive the survey were:

- Outpatient facilities,
- Out of the continental U.S., or
- Are identified as a larger healthcare system, for example, (Maryland Healthcare System encompasses Baltimore, Perry Point & Fort Howard VAMCs and would be identified as one facility).

The Booz Allen team also performed a literature review and interviewed staff during VAMC onsite visits to identify lead practices in the industry and provide VA with a more in-depth understanding of treating patients at-risk for limb loss and those with amputations.

FINDINGS AND CONCLUSIONS

The Booz Allen team uncovered key findings and came to several conclusions after conducting the Internet survey, reviewing literature for lead practices, and completing on-site visits. The most significant conclusion as a result of this study is that there is a lack of national oversight of the PACT Program and that many facilities are not emphasizing the preventive aspects of the PACT Directive. The key findings are described below.

There was evidence from both site visits and the internet survey that (1) the PACT Directive has been interpreted inconsistently across VA facilities, (2) facilities have chosen to emphasize different aspects of the PACT directive, (3) facilities have adapted design, measurement, outcomes, and accountability elements to address their local needs, and (4) the coordinator's role has been interpreted and implemented considerably different across facilities. Site visits revealed that treatment for patients at-risk for limb loss and with amputations is implemented using various structures and processes. Survey results indicated that facilities have implemented different criteria in the PACT Directive.

Facilities that designated a dedicated staff member as the PACT Coordinator have a higher level of implementation of the PACT Program, as evidenced by both the site visits and the internet survey. This is possibly attributable to better coordination of care among disciplines and closer monitoring of patient status. During site visits, the Booz Allen team recognized that dedicated PACT Coordinators instituted a variety of preventive approaches and treatments and typically have systems in place to assess and track patients.

Functional outcome measures are used to assess patient specific outcomes, determine the appropriateness of care, and to gauge the performance of the PACT Program. Many VA facilities utilize functional outcome measures such as the FSOD, which includes the FIM. FIM is a widely accepted clinical assessment tool for rehabilitation patients. However, staff at VAMCs and other practitioners cautioned the use of FIM to assess patients with prosthetic limbs because the tool does not capture the specific needs of prosthetic users. The majority of VA facilities also state they utilize EPRP as a method of reviewing performance. EPRP captures specific data from chart reviews as well as tracks amputation rates of facilities. Again, staff and other practitioners caution the use of amputation rates as the only indicator of performance and suggest using multiple performance measures to assess the impact of PACT activities.

Many facilities responded that they do not comply with specific guidelines outlined in the PACT Directive. Survey findings indicate that many facilities do not have identification and tracking methods for patients who enter the health care system who may be at-risk for amputation. The majority of facilities reported that they do not assess PACT patient satisfaction on an annual basis. Many facilities indicated that they did not assign risk assessment levels for at-risk patients. Many facilities also reported that they do not gather data to track patient outcomes in the FSOD or evaluate annually the outcomes of the PACT Program.

The Booz Allen team expected to find a relationship between the number of years that a PACT Program has been in existence and its level of implementation, yet after analyzing survey findings it was concluded that there is no direct relationship. Progress of PACT Program development may be impeded because of competing priorities at a given VAMC. Another barrier may be the absence of a dedicated PACT coordinator and therefore a lack of accountability for program performance.

The Booz Allen team created a methodology to rank VAMCs on the level of PACT implementation based on responses to selected survey questions. These questions identified facilities that met the following requirements: establishment of a program for treating patients at-risk for limb loss and patients with amputations; patient screenings; outcome data; and designation of a PACT coordinator. Out of 115 responses to the survey, 33 facilities were ranked high, 47 facilities were ranked moderate, and 35 facilities were ranked low.

Literature review findings support a proactive, multidisciplinary approach to identify and track at-risk and post-amputation patients and to monitor clinical progress via

information technology systems. The VHA Directive reflects the leading practices identified in literature findings through mandating that PACT Programs be interdisciplinary, proactively coordinate care, measure outcomes of care provided to PACT patients, and conduct annual evaluations.

AT-RISK FOR AMPUTATION STUDY

INTRODUCTION

Each year, approximately 56,000 diabetes-related amputations are performed nationwide. Of that number, about 22,000 amputations are performed within the VA healthcare system. Amputations affect the quality of life as well as functional status of individuals, with 81% of persons with lower limb amputation experiencing activity limitations. (Fotieo, Reiber, Carter, Smith 1999)[1]. The VA's PACT Initiative began in 1993 to apply a model of early detection and preventive care to patients at-risk for limb loss. Subsequently, prevention measures were identified, and recommendations were made for the care of veterans with several major diseases including diabetes mellitus. EPRP (External Peer Review Program), a systematic chart review from external reviewers, was developed to reinforce the practice of early detection, prevention and intervention using these recommended prevention processes. The EPRP database was designed for information storage and results from chart reviews.

The VA contracted with Booz Allen to evaluate program outcomes associated with patients at-risk for amputation. VA developed specific study questions for the evaluation of program outcomes.

1. Are patients with diabetes and vascular disease and those at-risk for lower limb loss screened and referred to the appropriate foot-care specialist?

2. Do patients with diabetes and vascular disease and those at-risk for lower limb loss receive information and education on risk factors for amputation?

3. Do VA patients, both PACT and non-PACT, when risk- and age-adjusted, have amputation and re-amputation rates the same as or less than those found in comparable non-VA patients?

METHODOLOGY

The Booz Allen team merged three different VA databases to create an electronic program evaluation database containing information on the study population used to answer the questions posed by VA. At-risk is defined in an epidemiological sense as

[1] *Fotieo GG, Reiber GE, Carter JS, Smith DG. Diabetic amputations in the VA: are there opportunities for interventions? J Rehabil Res Dev. 36(1):55-9, 1999 Jan.*

patients identified in the 1997 outpatient database (OPC) who had diabetes mellitus (DM) or peripheral vascular diseases (PVD). The index "globally at-risk" study sample includes 451,824 patients whose records included ICD-9 codes of DM or PVD during their 1997 outpatient visits.

These patients (451,824) were matched with patients identified in EPRP whose feet had been determined by a foot care specialist or physician to be at-risk. This produced a "targeted at-risk" study sample of 44, 012 patients. The "targeted at-risk" population was re-defined as patients who had foot inspections and a diagnosis of DM or PVD, whereas "global at-risk" population was defined from the original index patients (i.e., those with DM or PVD diagnoses).

The methodology for calculating amputation rates is listed below.

1. Combined four-year data and selected the highest amputation level of each patient

2. Calculated rate of amputation
   - Number of individuals with an amputation/number of individuals in the "global at-risk" patient sample

   - Number of individuals with an amputation/number of individuals in the "targeted at-risk" patient sample.

3. Calculated re-amputation rate for each year separately by examining patients' re-amputation rate in subsequent years, and at the highest level

4. Calculated the four year combined percentage of surgeries performed in VAMCs with highly and partially implemented PACT Programs

The results were risk-adjusted for age, gender, race, gangrene, ulcer, PVD, DM, prior amputation, and vascular surgery. Cox regression is the statistical procedure that was used to evaluate the extent multiple predictors are related to the outcome variable. Risk adjustment was performed to: 1) determine the variables that increase risk for amputation, and 2) examine the statistical distribution among different risk level groups to determine if patients at higher risk levels have more amputations.

Guidelines presented in the VHA PACT Directive (2001-030) were used to assign risk level to patients. According to the VHA PACT Directive at-risk is defined as "patients with diabetes, peripheral vascular disease and end stage renal disease, who are considered susceptible to ulcer development." Accordingly, risk levels were assigned as follows:

- Level 0: Patients who do not have evidence of sensory loss, diminished circulation, foot deformity, ulceration, or history of ulceration or amputation

- Level 1: Patients who have findings for Level 0 and also demonstrate evidence of sensory loss and/or diminished circulation, but no evidence of foot deformity or history of plantar ulceration

- Level 2: Patients who have findings for Level 1 and also demonstrate evidence of sensory loss and foot deformity but no history of plantar ulceration

- Level 3: Patients who have findings for Level 2 and also have a history of ulceration and/or prior amputation, Charcot foot deformity, or history of rest pain, reflecting the highest risk of lower extremity events.

To determine success of PACT Program implementation, Booz Allen Hamilton conducted an Internet survey based on the VA PACT Directive. Data were analyzed to establish a ranking of PACT Program implementation. Stations were identified as having a highly implemented PACT Program if their PACT implementation ranking were high. Stations were identified as partially implemented PACT Program ("non-PACT") if their associated PACT Program ranking were moderate or low.

Booz Allen staff also performed additional analysis for PACT Survey respondents/non-respondents. This analysis was performed to identify characteristics of facilities that ranked high, moderate and low for PACT Program implementation and facilities that did not respond.

FINDINGS AND CONCLUSIONS

The study findings demonstrate that clinical strategies for risk reduction are, overall, widely applied by VA staff. From responses of those who were surveyed in EPRP, 93.2% had a documented visual inspection of their feet. A high percentage of patients are or have been treated by a foot care specialist — 32.6% were referred, 50.6 % are currently under care, and 3.4% were previously evaluated. Among the patient population deemed to be susceptible, a high percentage underwent examination of lower extremity sensation (82%), evaluation of foot pulses (88%), testing for hemoglobin A1c (93%), and retinal examination (72%).

Analyses confirm many VA patients with diabetes (DM) or peripheral vascular disease (PVD) and at-risk for lower limb loss receive information and/or education on risk factors for amputation. The study data demonstrated that educational efforts are a high priority for VA. For example, 77% of at-risk patients received nutrition counseling; 84% received some type of counseling for smoking cessation; and 12% received prescriptions to change footwear.

The annual rate of amputation for at-risk VA patients during years 1997-2000 is approximately .5% (2% total for years 1997-2000). Initial amputation rates and re-amputation rates are higher in VAMCs with highly implemented PACT Programs than VAMCs with partially implemented PACT Programs. Among VAMCs that participated in the survey (n=350,216), the annual amputation rate for high PACT ranked facilities was

.7% (2.8% total for years 1997-2000), significantly greater than the annual amputation rate of .525% (2.1% total for years 1997-2000) from partial PACT ranked facilities.

High ranked PACT Programs appear to serve as "magnets" for patients requiring highly sophisticated care from a team of dedicated professionals. These PACT Programs appear to be recognized as providing superior care and consequently serve a disproportionate number of severe cases. Also, reviewing total numbers of amputations and amputation rate is not a good indicator of success by itself. A less severe amputation may be performed on an individual to prevent a more severe amputation and may be the most successful outcome for the patient.

The additional analysis conducted on PACT ranked facilities show that highly implemented PACT Program facilities are more likely to be large, urban and academically affiliated, suggesting that these facilities care for patients with more severe illnesses. Also interesting to note is that facilities that did not respond to the survey were less likely to be large, urban and academically affiliated.

The Booz Allen team also reviewed demographic and clinical variables that increase the relative risk of having an amputation. Many variables affected prediction of amputations, including having gangrene (13.9 times more likely), an ulcer (5.9 times more likely), or a prior amputation (4.4 times more likely). Patients who have PVD were 2.6 times more likely to have an amputation, and those with both PVD and DM were 9.8 times more likely to have an amputation than those with DM alone. The study results also show that males were 3.5 times more likely to have an amputation than females.

PATIENTS WITH AMPUTATION STUDY

INTRODUCTION

This portion of the program evaluation focuses on evaluating the functional outcomes for VA patients who have received a lower extremity amputation. The study concentrates on two specific research questions:

1. For VA patients undergoing amputation treatment, when risk- and age-adjusted:

   - Do they have discharge to community rates the same as or greater than comparable non-VA patients?

   - Do they return to their former physical functional capacity to the maximum extent possible at the same rate compared to non-VA patients?

2. Are VA patients, when risk- and age-adjusted, provided properly prescribed and fitted prostheses and Orthotics at equal or better rates compared to non-VA patients?

METHODOLOGY

The assessment of a patient's functional capacity and quality of life after amputation must be predicted using available tools, since there are no direct measurements available. The Functional Independence Measure (FIM), for example, is a widely accepted clinical measure based on clinicians' ratings of a patient's performance of motor and cognitive activities to assess the patient's "need for assistance" with performance of common daily activities.

Another accepted method of quantifying a patient's functional ability is through administration of patient self-reported health-related quality of life (HRQL) surveys. Such surveys capture the perception of the patient's functional ability by assessing pertinent elements of general health including physical and mental functioning (Ware 1993). Both the FIM and SF-36 are considered "gold standards" (FIM for functional assessments and SF-36 for generic HRQL assessments of health status).

A six-step process was used to extract data from VA databases and create a database for this study and to collect relevant non-VA data. The study population extracted from VA databases totaled 1,139 patients with FIM ratings and 2,193 patients with SF-36V ratings. The non-VA population totaled 48,334 patients with FIM ratings and 242 patients with SF-36 ratings.

Step 1: An electronic file was developed from the inpatient surgery Patient Treatment Files (PTF) for study years 1997 through 2000 from which records were selected if they had lower extremity amputations.

Step 2: An electronic file was developed from the Outpatient (OPC) Diagnosis, Visit and Procedure files where patients' diagnoses, visits, and demographic data could be identified. Patients were selected if, on their first outpatient visit, they had ICD-9 diagnostic codes for diabetes mellitus (DM) or peripheral vascular disease (PVD) affecting the circulation of the lower extremity.

Step 3: The Inpatient Surgery File was matched to the Outpatient File, so patients with diabetes or peripheral vascular disease who had amputations of the lower extremity could be identified with their demographic data. Patients were excluded if they: (1) died during the 1997 – 2000 study period; (2) had had a previous amputation (prior to 1997); and (3) were less than 19 years old.

Step 4: Data for FIM analyses were selected from the Functional Status and Outcomes Database for Rehabilitation (FSOD) File. Patients were selected if they had a lower extremity amputation, were 19 years old or older, had complete FIM records, and had

lengths of stay between 4-120 days. This step resulted in 1,139 patients with FIM records.

Step 5: VA Patients were selected from the SF-36V database using scrambled social security numbers. Patients were excluded if dates of surgery followed completion of the SF-36 survey, or if patients had more than one surgery. This left a sample of 2,193 patients. Few patients had complete data inclusive of independent variables.

Step 6: Non-VA FIM data were obtained from Uniform Data System for Medical Rehabilitation (UDSmr). Patients were selected if they had FIM scores for calendar years 1997 to 2000, had lower extremity amputations and had complete FIM data. This step resulted in 48,334 non-VA patients with FIM ratings. However, limited demographic and programmatic variables were available from the UDSmr database. Non-VA data on patients with SF-36 scores were obtained through FOTO, Inc. databases, which resulted in 242 records.

FINDINGS AND CONCLUSIONS

Analysis of the collected data indicates that the majority of VA patients (73%, n=1,139) and the majority of non-VA patients (78%, n=48,334) returned home following discharge. Findings indicate comparable discharge-to- community rates between VA and non-VA patient populations. Both VA and non-VA patient populations show improvement in motor function following amputation, however, non-VA patients tended to gain slightly more motor function. Data were age-adjusted, but further risk-adjustment was not possible due to missing data.

The majority of VA patients (84%) were satisfied with the quality of their prosthetic device. Approximately half the VA patients in the study population reported problems with their prosthetic device; however, over 80% reported their prosthetic device helped them meet their rehabilitation goals.

Veterans undergoing amputation have appreciable improvements in functional capacity after discharge and are well supported by VA. By most study measures, veterans' functional status after amputation improved after discharge from VAMC facilities, though at a rate somewhat less than their non-VA counterparts.

- Raw FIM scores, motor FIM scores, and motor measures improved in both populations, though somewhat more so for non-VA patients
- Cognitive FIM scores were effectively unchanged in both populations
- Self-described functional levels (SF-36) improved in both populations, though somewhat more in the non-VA patients

To the extent that differences were noted between VA and non-VA populations, it is not possible to conclude whether these differences were attributable to selection bias, factors unique to VA's patient population, factors unique to VA's operating environment, or other factors.

VA efforts to assist veterans in restoring optimal function are comprehensive.

- 93% of patients acknowledged having their questions answered regarding their use of prosthetics or assistive devices
- 57% acknowledged that they received specific instructions on use of their prosthetic device (38% reported that they already knew how to use their device)
- 95% stated they were satisfied with the amount of information they received
- 81% stated their prosthetic device helped them reach their functional goals

RECOMMENDATIONS

The Booz Allen team developed a series of recommendations regarding further evaluation of outcomes data for PACT patients, improvements in data accuracy and completeness, and steps to standardize the PACT Program if deemed advantageous. These recommendations have been prioritized for VA implementation.

1. Further Evaluate Amputation and Re-amputation Rates

VA should consider more fully evaluating the amputation and re-amputation rates in VAMCs with fully implemented and partially implemented PACT Programs. While the Booz Allen team has confidence in the data suggesting differences among amputation and re-amputation rates, these differences were not massive but statistically significant.. Nonetheless, if these conclusions were borne out through further study, a number of critical questions would arise.

Are differences the result of superior expertise and “best practices” in early management of high-risk individuals?

- Is this discrepancy positive or negative, i.e., do their observed higher amputation and re-amputation rates truly reflect “best practices” or a problem that merits further analysis?
- Are there practices and processes that should be disseminated to active and inactive PACT facilities alike, e.g., standardized limb-preservation care and amputation guidelines?
- Should VA compare specific clinical and process outcomes across individual VAMCs?
- Are there budgetary, staffing, and/or other financial implications to this phenomenon?

2. Convene a Multi-Disciplinary Panel to Address Data Needs

As part of its quality improvement program, VA should consider conducting a multi-disciplinary initiative to develop data elements and performance measures needed

across the continuum of limb-preservation and post-amputation care. Accordingly, the Booz Allen team recommends that VA convene a multi-disciplinary panel to:

- Determine additional data needs
- Identify opportunities for various services to share data and information in order to enhance each department's quality improvement efforts
- Develop strategies for unification of database elements
- Devise an ongoing mechanism to ensure that changing data needs are discussed by all relevant services

3. Improve Data Accuracy and Completeness

VA should consider an enhanced program of database education for its staff to increase the accuracy and comprehensiveness of its patient care data. Because of the size of its patient population and its database capacities, VA is in the privileged position to set national directions for the medical care of patient sub-groups through rigorous patient care research. Indeed, part of the difficulty in finding appropriate non-VA patient populations for comparison purposes is the unavailability of private sector and non-VA public databases and, consequently, the inability of those sectors to perform rigorous statistically based research.

VA should enhance the accuracy, comprehensiveness, and reproducibility of data entry and collection processes by VA staff to further improve the quality of subsequent studies on VA patients. This would allow the VA to better support its patient care quality, performance measurement and its funding requests.

4. Strengthen PACT Program Nationwide

The Booz Allen team developed multiple recommendations for VHA to standardize implementation and operation of the PACT Program nationwide if further research shows that the PACT Program meets its intended goals and objectives. These recommendations are related to a functional organizational structure, characteristics of key personnel on the PACT team, training and information dissemination, performance measures, clinical guideline applications, management tools and utilization of an expert multi-disciplinary panel. If implemented, these activities should facilitate the communication process between the PACT teams, and others who are also critical to the communication process. In addition, data collection process will be facilitated for increased and uniformed performance measurement and clinical outcomes related to the PACT Program.

The recommendations are listed below.

1. Reorganize the PACT Program to focus on the preventive aspects of the program by realigning the PACT Program to be under the Chief Consultant, Primary and Ambulatory Care Services.

2. Develop and identify a National PACT Lead and National PACT Coordinator positions for PACT Program coordination and oversight.

3. Maintain a multidisciplinary team environment at the local and central level for making key decisions and delivering healthcare services.

4. Utilize the Clinical Reminder package in CPRS to identify and track at-risk patients and to monitor the care received and future patient requirements

5. Utilize an Annual Evaluation Report to monitor performance

6. Develop training and education materials for nationwide distribution to ensure uniform clinical practices

7. Develop and maintain a data source from which to determine patient compliance with educational and counseling efforts and recommendations

8. Develop a consensus regarding appropriate amputation rates across PACT Programs

9. Implement efforts to enhance data completeness and accuracy, and enhance communication among data base managers

10. Perform on-site visits to facilities at all levels of implementation to evaluate the progress of PACT Program and to provide specific advice and guidance.