Service Line Management Evaluation Project

FINAL REPORT

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HIGHLIGHTS

In response to a request from the Under Secretary for Health, the Health Services Research and Development Service, through its Management Decision and Research Center and Houston Center for Quality of Care and Utilization Studies, conducted a three-year evaluation of service lines in the Department of Veterans Affairs (VA). The evaluation focused on implementation and effectiveness of service lines at both Veterans Integrated Service Network (VISN) and facility levels. This document presents the highlights of the evaluation, based on site visits to VISN offices and facilities, written surveys of facilities, and analyses of VA databases. Among the key findings are:

1. Service lines are widely used in VA, but their structures vary considerably.

– The term "service line" is not used consistently throughout VA (or in the private sector). Reliable information cannot be obtained simply by asking about "service lines." It is necessary to obtain detailed information about organizational form and reporting relationships to determine the existence of service lines and their structure.

– All VISNs implemented service lines of some form, but few VISNs altered lines of authority in their implementation.

– By 1999, 75% of all facilities had implemented service lines of some form. Several facility-level service lines had been implemented by 1993. In 1996 the rate of implementation of facility-level service lines increased sharply.

– Of those facilities that did implement service lines, more of them implemented service line divisions than any other structures. This structural form shifts lines of authority from service chiefs to service line managers.

– Only 27 facilities and 2 of the 22 VISNs that implemented service lines shifted budget control to the service lines. While the organization literature suggests that personnel control and budget control are correlated, this was not borne out by our findings.

– The clinical focus of VA service lines is predominantly in primary care, mental health, and geriatrics/extended care. This contrasts with the private sector, where the majority of service lines are in cardiovascular disease, oncology, and women's health.

– Service line managers most frequently were physicians, although in some cases multidisciplinary dyads or larger teams shared joint responsibility for service line management.

2. Facility service lines initially had mostly negative effects.

– Statistically significant and primarily negative relationships were found between facility-level service lines and quantitative outcomes related to VA performance goals. Most notably, facilities with service lines that had been in existence 24 months or less had significantly less improvement in outcomes than facilities without service lines.

– Similarly, service lines that had been in existence over 24 months and that had mixed patterns of personnel evaluation (i.e., personnel accountability within the service line varied considerably among professions) had less improvement in outcomes than facilities without service lines.

– Facilities with other forms of service line structures in existence over 24 months performed as well as facilities without service lines.

– The negative findings may reflect the turbulence associated with implementing change, resistance to change, or ambiguity in the change process and in the mixed-evaluation service lines.

3. Sufficient quantitative data were not available to measure the effects of service lines at the VISN level.

– Managers in VISNs reported that service lines had positive effects on guideline implementation, uniformity of care, care coordination, cost and utilization, access and enrollment, communication, reduced competition, enhanced attention to professional issues, and staff motivation. Managers in VISNs with stronger service line structures reported more positive effects than managers in VISNs having only service line task forces.

– VISN-level service lines have not been implemented long enough to determine their effects on quantitative measures associated with VA performance goals.

4. Implementing service lines presents many management challenges.

– The VA personnel system was noted as a substantial barrier to service line implementation. Many interviewees reported that they had difficulty establishing service line manager positions at a grade level that was attractive to qualified candidates.

– Facility leadership frequently resisted implementation of VISN-level service lines, and service chiefs frequently resisted implementation of facility-level service lines. As a result some VISNs implemented service line task forces as a compromise between the more robust structures that VISN directors wanted to implement and the structures that they could implement.

– Many interviewees perceived that service line managers lacked requisite skills and experience, especially in general management and financial management, and would benefit from additional training.

– Several interviewees expressed concern that service lines would have a negative effect on professionals, professional standards and professional development. Several facilities had implemented a service line structure in which disciplinary leadership was completely eliminated but later modified it to re-establish professional leadership positions such as “lead social worker” and “nurse executive” or professional councils.

1. INTRODUCTION

Recent developments in the health care industry in the United States and abroad have highlighted the need for research into new ways of organizing health care delivery. Specifically, the movement to integrate multiple facilities and types of care into large, integrated delivery networks (IDNs) that provide services across the continuum of care has generated a number of organizational challenges. Such IDNs are faced with the need to deliver service of consistent content and quality to patients seeking care from multiple providers associated with multiple institutions, oftentimes across wide geographic regions. Furthermore, they are challenged to deliver this care in a cost-effective manner that is responsive to their patients and to payers of the care. One frequent response to such challenges in the private sector is the establishment of clinical service lines that cut across both institutional and disciplinary boundaries to organize patient care around specific diseases, interventions or populations. Such service lines have been established both within individual hospitals and at the IDN-level across facilities.

In 1995, the Veterans Health Administration embarked upon a reorganization into IDNs similar to those in the private sector. VA hospitals, which had previously operated as independent providers of care, were reorganized into twenty-two IDNs, termed "Veterans Integrated Service Networks" (VISNs). VHA managers were thus faced with the same dilemmas of organization that challenged the rest of the industry. A number of VA senior managers, including the Under Secretary for Health, believed that service lines were an effective mechanism for organizing the VISNs in the new environment of VHA. In 1996 several VISNs were considering reorganization by service lines, but none had yet begun implementation of IDN service lines. Some individual hospital facilities were known to have reorganized into a service line organization, but no reliable information was available on how many facilities had reorganized or on the effects of organization by service line. Thus, in January 1997, the Under Secretary for Health, Dr. Kenneth Kizer, commissioned the Health Services Research and Development Service's (HSR&D) Management Decision and Research Center (MDRC) and Houston Center for Quality of Care and Utilization Studies (HCQCUS) to conduct an evaluation of service line management at both the facility and VISN levels in VHA.

The overall goal of this project is to assess the effect of organizing into service line structures on the achievement of organizational goals. The project's two objectives are:

1) To describe service line implementation in terms of clinical area and structural form at both the facility and VISN levels.

2) To empirically compare the effect of service line forms of organization at the facility level to traditional organizational forms on the achievement of certain organizational goals.

To achieve these objectives, it was necessary to construct a design that would allow us to study service line phenomena at multiple levels of analysis and with varying degrees of precision, depending on the state of previous knowledge. This design was based on a review of the conceptual work that would enable us to develop a meaningful way of classifying the many different structures that were all being called "service lines" in the field.

The remainder of this report is structured as follows: The background and the questions and hypotheses that specifically drove the evaluation design are presented first. Then, the methods of the study are summarized. Finally, the results of each phase of the project are presented and discussed, and issues remaining for further evaluation are identified.

2. BACKGROUND AND CONCEPTUAL MODEL

2.1 Clinical service lines in hospitals

Clinical service lines may be defined as a family of organizational arrangements based on a hospital's outputs, rather than on its inputs. Clinical outputs of health care can be defined in three ways:

– procedures or interventions, such as surgery, radiation therapy, or organ transplantation;

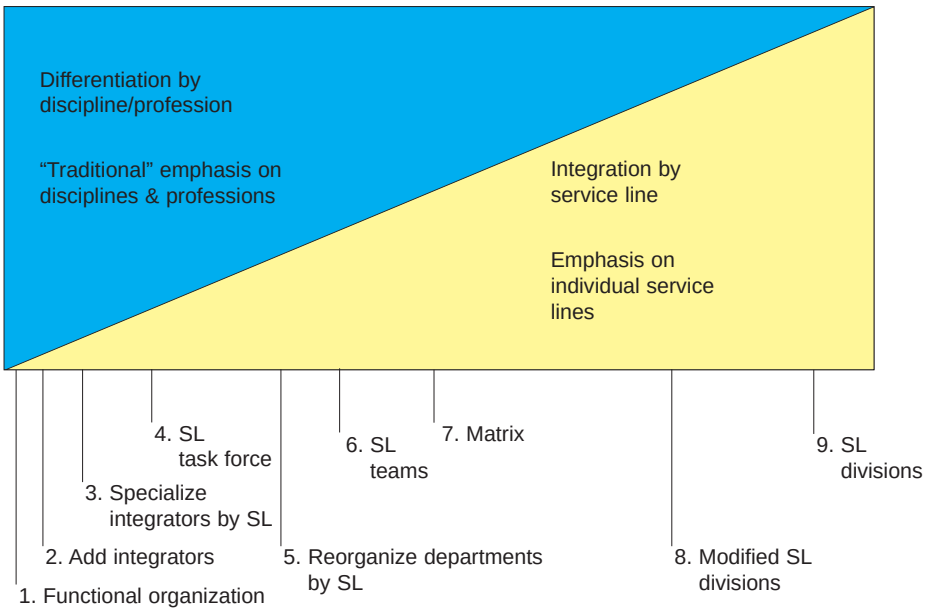
– management of diseases, such as comprehensive care for cancer or for heart disease;

– management of care for and/or maintaining health of identifiable segments of the population, such as older adults or children.

All of these bases for service lines can be readily found in practice, and they are not mutually exclusive. Key defining characteristics of clinical service lines are that they are multidisciplinary, have a clinical care mission, and provide a mechanism for integrating personnel and services across disciplines.

Based on extensive case studies of service line development in hospitals, Charns and Tewksbury (1993) developed a nine-point continuum of organizational structures for hospitals that places traditional discipline/professional departmental and service line divisional designs as endpoints (see Exhibit 1). The theoretical constructs that provided the starting point for the development of the continuum are discussed in Appendix A. The continuum[1] arrays structures in terms of their increasing focus on integration of disciplines for delivery of services. Concurrent with the increase in focus on integration is a decrease in emphasis and advocacy for each discipline/profession individually. Moving from left to right along the continuum, the structures depicted provide increasing integration for each service line and also decreasing emphasis on each traditional discipline and profession. Each structure along the continuum has both advantages and disadvantages, with the endpoints of the continuum representing the extremes of emphasis on individual disciplines and professions versus service lines. The nine structural alternatives, along with their advantages and disadvantages, in individual hospital facilities are described in Exhibit 2, below.

Exhibit 1: Continuum of Organizational Configurations



[1] This framework was used in the VA services line guidelines, developed at the request of the Chief Network Officer in the Office of the Under Secretary for Health, by a national workgroup chaired by Laura Miller, Network Director for VISN 10. The purpose of the guidelines was to provide guidance and consistency in use of service line terminology throughout VHA. The guidelines were distributed in draft form to all VISNs in 1998.

Exhibit 2: Charns and Tewksbury Organization Forms

	Description	Strengths	Limitations
1	***Traditional "Functional Organization."*** The major units of the medical center are traditional professional disciplines or functions, such as nursing, food service, social services, etc. This form provides a management focus for each discipline to function independently.	– maximizes focus on professional development and professional standards – maintains state of the art in each profession – facilitates sharing of resources within each department or service throughout the hospital	– provides no substantial integration for delivery of services across disciplines – contributes to territoriality by profession/ discipline and fragmentation of care
2-3	***Integrators.*** Planners or analysts provide a focus on various clinical areas through planning, marketing or analytical activities. Individual integrators either are assigned on-going responsibility for specific clinical areas (3) or share responsibilities for clinical areas (2).	– provides initial focus on service lines and their outputs throughout the medical center – vehicle for coordination across traditional departments – no detrimental effect on disciplines or professions	– weakest approach to integrating across traditional departments
4	***Multidisciplinary Task Forces.*** Multidisciplinary service line task forces consist of members from different discipline/professional departments, who address specific planning, marketing, or operational improvements within service lines. These task forces are temporary and disband after their assigned task is accomplished. Staff retain reporting relationships to their discipline-based departments or services. The task force leader does not provide input to members' performance evaluations. Within VA, these task forces do not themselves meet the definition of service lines, but rather are precursors to service lines or are adjuncts to service lines.	– can be used to address planning or operational improvements within a facility (e.g. planning for implementation of new service lines or addressing how to improve delivery of care to a specific type of patient) – allows for multidisciplinary input and collaboration – causes little disruption to traditional discipline-based departments or services	– does not provide for on-going management of the service line over time – limited as coordinating mechanisms because they are not based on enduring relationships among group members
5	***Reorganize Departments (Services).*** Each major discipline/professional department is internally restructured so that its sub-units correspond to different service lines (e.g. specializing nursing units so that all patients of a service line are admitted to a designated unit; assigning patients to individual social workers and therapists consistently on the basis of service line). Reporting relationships of personnel and sub-units remain within their departments.	– enables staff to specialize in their service line clinical content – permanence of personnel assignments to different service lines allows staff to develop working relationships that assist in coordination	– as departmental staff is assigned to specific service line clinical areas, the department loses some flexibility to respond to fluctuations in workload across the medical center
6	***Multidisciplinary Clinical and Management Teams.*** Individuals from different disciplines are assigned to permanent teams. Staff retains formal reporting relationships to discipline-based services or departments. The service line manager serves as the team leader and provides input to members' performance evaluations. Generally, the teams have a clinical mission. Some service lines are not managed by single managers but by management teams– for example, a triad representing medical, nursing, and administrative leadership or a dyad of a physician and a nurse leader.	– provides a mechanism for ongoing interaction of personnel from different services and a sustained management focus on the service line – provides substantial integration within each service line	– requires major adjustments by the traditional service chiefs, who lose a large amount of their control over personnel in their services – a management team may be more powerful than an individual service line manager, but is challenged to manage the team's group dynamics
7	***Matrix Organization.*** The organization is simultaneously organized along the two dimensions of traditional departments (services) and service lines. Key staff and managers have two lines of accountability – one to the department and one to the service line. The service line and department managers jointly evaluate these "matrixed" individuals and have equal influence.	– provides management and coordination of both disciplines/professions and service lines simultaneously – has advantages of both the traditional discipline/professional departmental structure and the service line divisional structure	– the most complex of all organization designs to manage – difficult to maintain the balance between the two dimensions of the matrix – presents high demands for conflict management
8	***Reorganization into Modified Service Line Divisions, Maintaining Discipline Leaders.*** The facility structure is altered by shifting primary reporting relationships from discipline-based services to service lines. Each service line is self-contained, with all of the core personnel needed to provide care to its defined group of patients. (Some administrative and clinical support functions may remain organizationally separate from service lines.) Service or discipline chiefs have no formal authority for personnel in their disciplines. Discipline councils, such as a nursing council, may also be developed to oversee facility-wide professional practice and professional development.	– places primary emphasis on service line – service line managers control the resources required to address the needs of their patients and therefore may respond more rapidly and appropriately – eliminates the fragmentation traditionally found among discipline-based services	– functions of the traditional discipline-based services (e.g. sharing of staff and resources within each discipline across service lines; maintaining organizational focus on each discipline) greatly diminished – may reduce the organization's ability to maintain the state of the art in each professional area – risk of fragmentation among service lines
9	***Fully Implemented Service Lines in a Divisional Structure.*** The last stage in reorganization is full implementation of service lines and complete removal of all organizational mechanisms that focus on individual disciplines and functions.	– enhances and optimizes the features of the modified divisional form – this form takes service line integration to its highest level	– no mechanisms for individual professional issues including performance review, mentoring and professional education – no mechanisms for sharing staff and resources within professional/ disciplines – territoriality and fragmentation may develop among service lines, hindering sharing of resources and transfer of patients

2.2 Clinical service lines in IDNs

Previous work suggests that the purposes and structures of service lines at the facility level are different from those at the IDN level (Parker, Charns and Young, 2001). The purposes of service lines within facilities are determining and reducing costs, improving marketing of services, and/or improving processes and quality of care. At the IDN level, however, they can also be very useful in resource allocation, in altering availability and access to different services, and in promoting uniformity in processes and procedures by shifting from facility-driven processes to processes and management that focus within each clinical service line across the network. Scott (1996) argued that IDNs should consider service lines that integrate across facilities for the following reasons: they can eliminate excess costs associated with under-utilization, centralize dispersed services in one place, enable cross-training of employees, disseminate best practices across locations, and allow for the standardization of services.

Shortell et al. (1993), in particular, have advocated for service lines as a mechanism for achieving clinical integration across facilities. However, the literature on IDNs provides no description of the different forms of service lines nor guidance on when different forms are most appropriately used. Therefore, Parker, Charns and Young (2001) extended the original Charns and Tewksbury (1993) organizational continuum to apply it to IDNs, as shown in Exhibit 3.

When the organizational continuum is applied at the level of the IDN, the organizational tradeoff is between integration across facilities and independent operation of each facility. Thus, the left end of the continuum represents traditional organization of an IDN by facility with no IDN-level service lines. The right end of the continuum represents complete organization of the IDN by service lines, with no management of individual facilities per se. Successive positions from left to right on the continuum represent increasing emphasis on service lines with decreasing emphasis on managing each facility. In moving from left to right on the continuum, service line managers assume greater strategic roles and the facility senior managers' roles shift more toward operations management. As in the individual facility level, each variation of IDN-level service line organization is expected to have its own advantages and disadvantages. These advantages and disadvantages are likely to vary depending on the service line clinical focus, its purpose, and whether it is being implemented simultaneously at the medical center and network levels. The different IDN structures, together with a summary of their advantages and disadvantages, are presented in Exhibit 4.

Exhibit 3: Continuum of Organizational Configurations - IDNFS

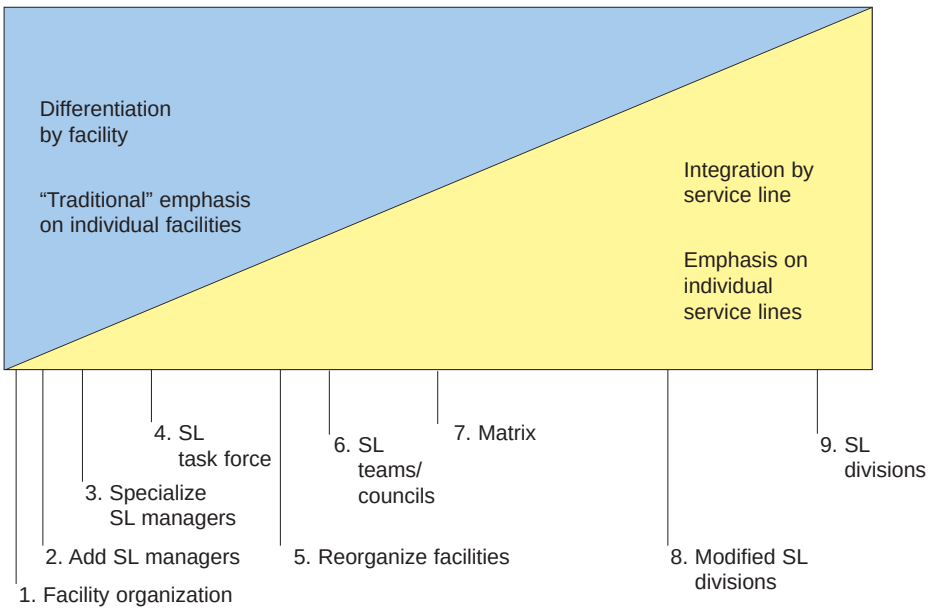


Exhibit 4: Descriptions of Network Service Lines

	Description	Strengths	Limitations
1	***Traditional Facility Structure.*** The primary management units in the IDN are the facilities; facility management remains intact.	– facility autonomy and connections with traditional stakeholders are maintained – each facility may address the needs of its local market	– does not contribute to any substantial integration across facilities – facilities compete with each other for resources – territoriality by facility is fostered – no performance benefits of this structure over independent hospitals that are not members of a network (Conrad, 1993)
2-3	***Individual service line managers.*** Individuals are given responsibility for service lines. They have no formal authority over personnel providing services to patients in the service line clinical area, nor budget authority.	– provides a management focus for the service line area, its market and resource requirements	– limited by lack of authority – highly dependent on personal influence of service line manager
4	***VISN-level Task Forces.*** Task force members are drawn from different facilities, and formal reporting relationships remain facility-based. These task forces have no formal power, input on performance evaluations of task force members or budget control. Because they are by definition not permanent structures, VISN-level task forces are not considered service lines within VA.	– task forces can obtain input from facilities and some commitment to the recommendations they develop – can be used to develop plans of action across facilities (e.g. implementation plans for guidelines and uniform policies, or plans for service line implementation)	– task force leadership has no formal control over task force members – effectiveness is highly dependent on the influence of the task force leader and the support of the task force by VISN leadership
5	***Reorganize Facilities.*** Each facility is reorganized internally into service lines. VISN-level service line directors have no formal authority over the facilities or corresponding facility-level service line managers.	– on-going relationships facilitate coordination across facilities – may be used as a transition to more integrative service line structures, and is necessary for implementing network-level service line divisions	– network-level service line director is limited by lack of authority over facility-level service lines
6	***VISN-level Service Line Teams/Councils.*** Representatives from different facilities serve on permanent VISN-level groups focusing on specific clinical areas. Councils may provide input on performance evaluations of council members, although members' primary reporting relationships remain at their home facility. Because they are permanent – in contrast to task forces – councils are considered service lines in VA.	– provides a mechanism for ongoing interaction of personnel from different facilities and disciplines – provides a VISN-wide perspective – typically used to provide policy recommendations, and to monitor, plan, and coordinate the activities within each service line across facilities – more influential than task forces due to permanence	– limited by their inability to directly control personnel, whose primary relationships remain with their facilities
7	***Matrix Organization.*** Authority and influence are balanced between the VISN-level service line directors and facility leadership. Thus, each facility-level service line manager is evaluated jointly by the network-level service line manager and the facility senior management (i.e., chief of staff or facility director). Budget is allocated simultaneously by service lines and by facilities.	– provides the advantages of both organizing by facility and organizing by VISN-level service line – provides coordination and management of both dimensions	– difficult to maintain the balance between the two dimensions of the matrix – latent conflicts between the goals of VISN service lines and the goals of facilities are surfaced, raising the importance of conflict management skills
8	***Modified Service Line Divisions.*** In this model, as in model #9 (see below), the basis of organization is the network-level service line. Facility-level personnel, typically facility-level service line managers, report directly to VISN-level service line directors. Facility leadership is retained and is responsible for operations and for coordination of service lines within each facility.	– maximizes clinical integration throughout the VISN by giving primary control to VISN service lines rather than to facilities – is a stronger approach to service line management than are teams/councils or matrix structures	– may reduce the ability of facilities to respond to facility-level stakeholders and to coordinate across service lines within facilities – may make it difficult to recruit talented individuals into facility management positions – competition among service lines may result in fragmentation
9	***Network Service Line Divisions.*** Like model #8, facility-level personnel ultimately report to VISN-level service lines, but there are no managers at the facility level responsible for the facility or coordination across facility-level service lines. Managerial emphasis in the network is shifted totally to the service lines. Although theoretically possible and conceptually consistent with the facility-level service line divisional structure, no examples of this structure are known to exist in practice.	– allows for the greatest control by each service line director – promotes the perspective of network-wide issues within each service line and facilitates deployment of resources within each service line	– facility concerns are minimized, as are professional issues – sharing of resources across service lines is most difficult in this form – high potential for fragmentation among service lines, especially when performance measures allow one service line to gain at the expense of others

This continuum is based on the authority of service line managers and the organizational form (e.g. task forces, teams/councils, etc.) used to integrate across facilities. Organizational mechanisms other than personnel authority may be used to enhance the influence of service lines and service line managers. These mechanisms include resource control and authority to set policies, standards and performance measures.

As noted above, when the service line evaluation project was initiated, some VISNs had indicated their intent to implement VISN-level and facility-level service lines, but the structures of these intended service lines varied from task forces to service line divisions. Previous work on service lines in the private sector suggested a number of potential benefits of service lines, but no evidence was available on the effect of this type of organization on organizational outcomes, particularly quality of care. Furthermore, prior empirical work was based on case studies of a small number of organizations, and most of that work concerned service lines within hospitals. Thus, there was no strong empirical evidence to guide VA's service line development in VISNs.

3. EVALUATION DESIGN

3.1 Guiding questions

Objective 1: Describing service line implementation: To address this objective we began the project with an examination of service line organization at the VISN level. We then examined service lines in the facilities. This inquiry was organized around questions based on the conceptual model of service lines explicated above. These questions were:

1. In which VISNs have service lines been implemented? What structural forms do they take? What is the distribution of clinical foci of service lines? How has implementation of service lines progressed?
2. How did each VISN's strategy of network development and integration relate to its organizational structure (application and types of service line forms)?
3. In which medical centers have service lines been implemented? What structural forms do they take? What is the distribution of their clinical foci? How has implementation of facility-level service lines progressed?

Objective 2: Empirically testing the effects of facility-level service lines on organizational outcomes: We developed specific hypotheses related to service line activity and outcomes at the facility level. These hypotheses are based on the general theory discussed earlier, as well as on specific points discussed below. Service lines shift an organization's emphasis from the care process inputs (i.e., the work of each profession and discipline individually) to its outputs (i.e. the array of services that together constitute a patient's care experience). Thus, it brings together multiple disciplines and is expected to encourage collaboration and coordination among health care professionals from different disciplines. These features of a service line structure in turn are expected to result in greater success in meeting organizational goals related to the quality and efficiency of patient care.

We also expect a dose effect regarding service line structures. Based upon their case studies and general organizational theory, Charns and Tewksbury (1993) argued that service line structures further to the right on their continuum provide greater integration and focus on the hospital's outputs. These, in turn, are expected to result in higher levels of patient-centered care and more effective utilization of resources. Furthermore, consistent with the view that structures further to the right on the continuum are more integrative, VA's Service Line Guidelines state that a team, matrix or divisional structure is needed for service lines and that a task force is not sufficient.

Finally, organizational changes take some period of time to take effect, as personnel learn their new roles and responsibilities and develop new working relationships (cf., Charns and Tewksbury, 1993, Chapter 7). Therefore, we expect that over a period of time service line structures will have an increasing impact on outcomes related to stated organizational goals.

Based upon this logic, we hypothesize:

H1. Hospitals with service lines will have greater success in achieving organizational goals related to patient care than hospitals without service lines.

H2. Hospitals with service line structures further to the right on the Charns and Tewksbury (1993) continuum (e.g. more integrated) and service line structures of longer duration will have greater success in achieving organizational goals related to patient care than hospitals with less integrated structures and/or service line structures of shorter duration.

3.2 Evaluation methods

Investigation of a complex phenomenon that exists at multiple organizational levels and may have multiple types of effects requires a multi-method inquiry strategy. Collecting multiple types of data, from multiple sources, to develop as complete an understanding of the phenomenon as possible is consistent with a strategy of triangulation (Jick, 1979). Thus, the strategy in this study has been to study the service line implementation process in multiple stages. At each stage we related our questions and methods to the state of knowledge about service lines available at that stage in the evaluation process. We have utilized both qualitative methods to develop a richly textured understanding of the different approaches to service line management and its implementation, and quantitative methods to identify potential relationships between service line management and outcomes. The design included the following phases:

1) ***Developments at the VISN level:*** Exploratory site visits to each VISN office and to a sampling of facilities, designed to begin answering questions 1 and 2 (see page 7), were conducted in 1997. Follow-up site visits to selected VISNs and facilities were conducted in 1998 and 1999, to extend the analysis of developments at the VISN level in relation to questions 1 and 2. A telephone survey was also conducted in 1998 and 1999, to reach VISNs that had not been visited in either of those years. In addition to using this information to describe VISN service line development, we formally coded the interviews to tally perceived effects of service lines.

2) ***Service lines at the facility level:*** Based on preliminary findings from the site visits, a survey instrument designed to elicit information on facility-level service lines from all facilities was developed and pilot-tested. The revised (based on pilot testing) facility-level survey was administered in two consecutive years, 1998 and 1999[2]. This provided descriptive data on the extent and types of service lines implemented at the facility level and addressed question 3.

3) ***Relationship of service lines to outcomes:*** Data from the survey regarding service line form and duration were then analyzed in relationship to data obtained from VA databases regarding various patient outcomes and health care service utilization, in order to test hypotheses 1 and 2.

Detailed descriptions of the methods for each of these components are presented in Appendix B.

[2] Throughout this report the 1998 survey data were used in analysis, and all references to "the survey" are to the 1998 survey.

4. FINDINGS

4.1 VISN-level descriptive findings

In this section we present descriptive information about VISN-level service lines and their development. This section includes:

– Information about the clinical focus of service lines

– Descriptions of service line structures and their change over time

– Different patterns of use of service lines in different VISNs

– VISN managers' perceptions of service line effects.

All VISNs used service lines in some form, but the VISNs differed in their emphasis on service lines and in the service lines' organizational structures and authority, clinical focus, and pattern of implementation.

Service lines were most frequently implemented in mental health, primary care, and geriatrics/extended care during the period 1997-1999. Exhibit 5 presents the clinical focus of service lines in the twenty-two VISNs for each of the three years, 1997 through 1999. In 1999 twenty-one VISNs had mental health service lines, seventeen had primary care service lines, and sixteen had geriatrics/extended care service lines. Only one VISN did not have a mental health service line, and that VISN did have a more narrowly focused service line for "severely mentally ill." Although they are less numerous, service lines were also implemented in prosthetics in eight VISNs, in spinal cord injury in five VISNs, and in acute care in four VISNs. Thirteen VISNs also had VISN-level consolidated diagnostic services (consolidated services do not fit the service line definition because they are not organized around outputs of care for specific diseases or populations).

The task force structure was the most frequently used structure for service lines in all three of these clinical areas. Exhibit 6 presents the distribution of organizational forms for the three most frequently implemented service lines, mental health, primary care, and geriatrics/extended care, in 1999. More than half of the service lines in each of the three clinical areas were structured as task forces. Teams were the second most frequently used structure, followed by service line divisions. The matrix structure was used in all three clinical areas in one VISN and in one clinical area in another VISN; this will be discussed in more detail below.

Exhibit 5: Clinical Focus of VISN Services Lines 1997-1999

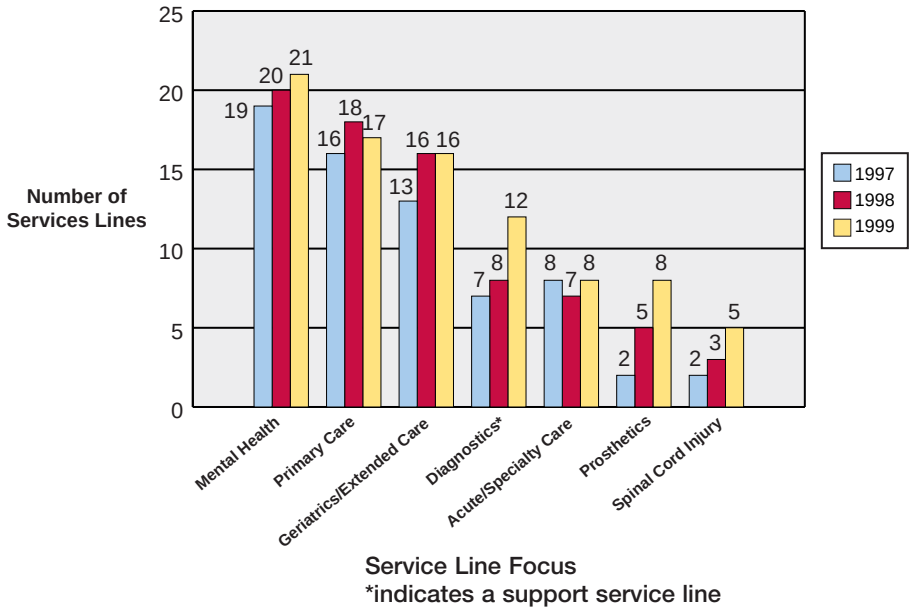
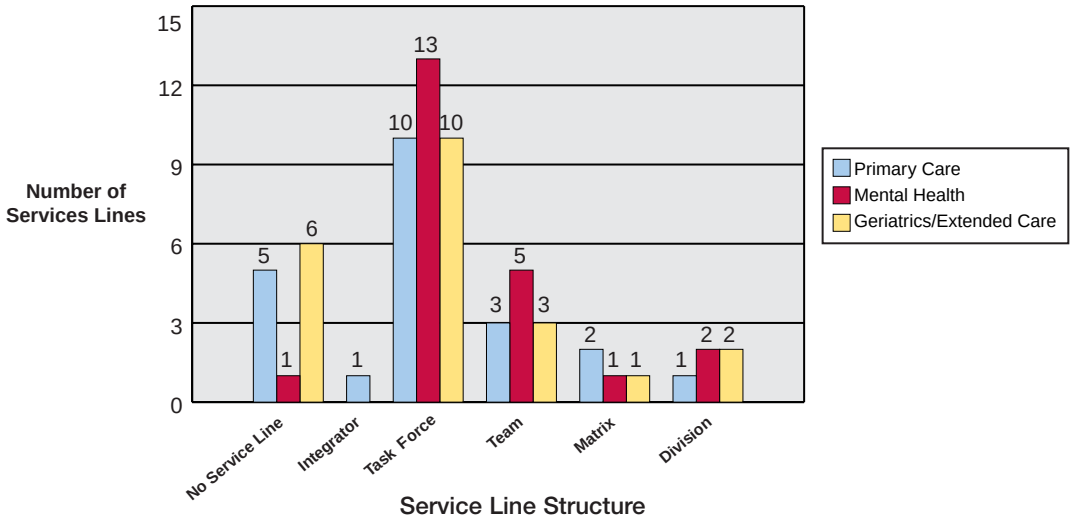
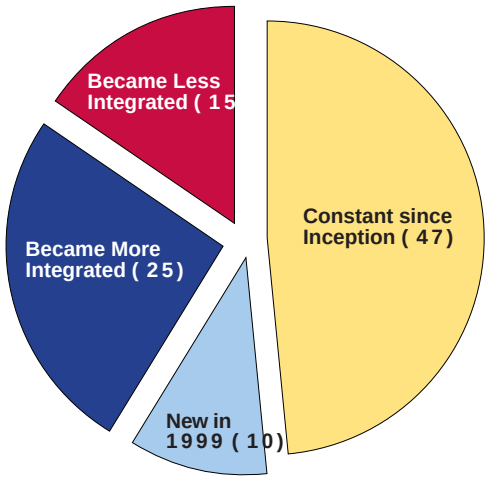


Exhibit 6: 1999 Network-Level Service Structure



Of the 97 VISN-level service lines reported, 47, or nearly half, had the same organizational form from the time of their inception through 1999. Over the period 1997 through 1999, a total of 97 service lines were established in the twenty-two VISNs. Seventy-nine of these service lines were initially established in 1997, eight in 1998, and ten in 1999. The distribution of patterns of change in structure for the 97 service lines is shown in Exhibit 7. Twenty-five, or 26% of the total, had evolved from less- to more-integrative forms; i.e. they had changed from structures on the left side of the continuum of Exhibit 3 to forms further to the right. Most of these changes were service lines that had originated as task forces and then changed to teams. Others evolved further from teams into matrix or divisional structures. Four, all in VISN 2, initially were established as task forces and were restructured directly into divisional structures. Fifteen of the 97 service lines restructured from more-integrative to less-integrative forms. Eleven of the fifteen were task forces that developed recommendations and then ceased operations. The remaining four service lines were teams that were restructured into task forces.

Exhibit 7: Changes in Structure Among Network-Level Clinical Service Lines, 1997-1999



Different networks have adopted different approaches to their use of service lines. VISN 2 was the only VISN to have completely reorganized into service line divisions, and did so in 1998. VISN 5 also implemented some service line divisions in 1999. In both VISNs 2 and 5, service line directors had budget control for the areas covered by their service lines. VISN 1 was in the process of reorganizing in late 1999, but did not yet meet the criteria for the division category. VISN 10 implemented a matrix structure in 1999. VISN 10 in 1998 first developed VISN-level teams, together with facility-level service lines in which service line managers retained their reporting relationships to the facility senior management. In 1999 VISN 10 then assigned control over service line budgets to VISN service line directors. We have classified these arrangements as a matrix organization because they are balancing facility and VISN-level service line influence in decision making.[3] VISN 13 was pursuing the same pattern of development of service lines as VISN 10. They had implemented VISN-level service line teams and indicated that their intention was to provide budget control to VISN service line directors.

A number of other networks had implemented several service line teams. These teams functioned as mechanisms to share information, as well as to recommend network-wide policies for implementation by the VISNs' executive leadership councils. In one VISN, the leadership reported that multiple state jurisdictions, a complex union situation, and a number of facility mergers made tightly integrated network service line divisions seem impractical. Instead, the network director convened service line teams/councils charged with determining and implementing best practices in specific clinical areas, and reported that these groups were very successful in meeting their objectives.

Some VISNs implemented service line task forces in primary care, mental health, and/or geriatrics/extended care, and one or two service line divisions in spinal cord injury and/or prosthetics. In such cases network leadership indicated that it was easier to implement the divisional structure in service lines having a narrower focus than those with a broad range of services, and they moved forward with the divisional structure in those areas.

In four networks, VISN-level task forces were formed and disbanded. Individuals within the networks gave different reasons for why the task forces disbanded. In one network, the Network Director cited the lack of line authority or budget control as the reason some task forces were not successful at achieving integration. In another network, a change in leadership was cited as being partially responsible. The current Network Director stated, "Most of the network service lines are non-existent; they were created by the previous Chief Medical Officer and Network Director… They really weren't accomplishing anything; there was no effort to try to reinvigorate them. We were cutting our losses." In a third VISN, task forces were set up early on to "determine if this idea [service lines] had any merit." After nearly three years of meetings, the task forces were discontinued. Interviewees in that VISN explained that committee members had "gotten busy with other things" and that the network was "too geographically dispersed to meaningfully integrate any services."

The process of VISN service line development has been slow in comparison with development at the facility level. As described above, as of the end of 1999 very few VISN-level service lines of the divisional form had been in place for a year or more, and most service lines were organized as task forces (Exhibit 6). One reason frequently reported for the slowness in implementing network-level service lines was barriers in personnel practices. Interviewees in several networks remarked that appropriate job levels and position descriptions for network-level service line directors who would have authority over facility-level service line managers did not exist and reportedly were difficult to create. Thus, networks that went ahead with extensive reorganizations did so by mechanisms such as developing the service line director positions as time-limited appointments pegged to the incumbents' pre-existing grade levels or as collateral responsibilities. VISN 13, which was emphasizing service lines as a central element of their integration strategy, had requested senior executive service (SES) level positions for its service line directors, and this request was not approved until late 2000.

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[3] Strictly speaking, a matrix organization distributes both personnel and budget authority equally in two dimensions to attain the balance in decision making, rather than allocating personnel authority to one and budget authority to the other. There are no examples of network matrix organizations in the literature to which we can directly compare. By referring to the arrangements in VISN 10 as "matrix" we are able to differentiate them from teams/councils and from divisional structures, as well as reflect the intent of the designers of structure, the VISN leadership.

As of the end of 2000, VISN-level service lines had not been in place long enough to investigate their relationships to outcomes. Since few network service line divisions have been implemented for more than a year, we would not expect to be able to detect positive effects on outcomes related to VA performance measures. While there are many VISN-level service line task forces, task forces are not considered to be service lines within VA and also would not be expected to have a very large effect on outcomes. From the time that service lines are implemented, we expect one to two years before the initial turbulence of the change process subsides. Following that period, one year of post-implementation outcomes data needs to be compiled and compared to the pre-implementation period. For those service lines implemented in 1999, the outcomes for 2002 to 2003 are needed to investigate relationships between service lines and outcomes. We believe that using data from an earlier period would yield misleading results.

Although we could not examine quantitative outcomes associated with VISN-level service lines, we coded the interviews from the ten VISNs that we visited in 1999 for positive and negative attributions of process and outcomes associated with service lines. These attributes were coded in nine categories (Guideline Implementation, Uniformity of Care, Care Coordination, Cost and Utilization, Access and Enrollment, Communication, Competition, Staff Motivation, and Professional Issues). The average number of negative comments per interviewee in every VISN was less than 1. There was not enough variation in negative responses to provide useful comparisons among VISNs. The average number of categories (of the nine categories coded) in which respondents made positive comments are presented for the ten VISNs in Exhibit 8.

Networks' perceptions of positive attributes of service lines varied with service line structural form. The networks with only task forces had the lowest average number of positively coded categories. In addition, the task force structure characterizes the four VISNs having the lowest number of positively coded categories. However, task forces were also used by VISNs ranking second and fifth of the ten VISNs. The highest ranking VISN structured its service lines in a divisional structure; it was the only one visited in 1999 that used divisions extensively. The two VISNs having teams and the one having a matrix had a higher average number of positively coded categories than the average of the VISNs using task forces and lower than the one using divisions. Representative quotes from interviewees for each category are presented in Exhibit 9 (on Page 14).

Exhibit 8: Average Number of Positive Effects Attributed to Network Service Lines Reported by VISN Staff From 10 VISNs Site Visited in 1999

VISN	Average Number of Positive Effects Attributed to Network Service Lines	Type of Network Level Service Lines Implemented
A	4.0	Divisions
B	3.2	Task Forces
C	3.2	Teams
D	2.7	Matrix
E	2.6	Task Forces
F	2.3	Teams
G	2.0	Task Forces
H	2.0	Task Forces
I	0.6	Task Forces
J	0.3	Task Forces

Service Line Structure	Number of VISNs with Service Line Structure	Average Number of Positively Coded Categories per VISN
Task Forces	6	1.8
Teams	2	2.75
Matrix	1	2.7
Divisions	1	4.0

Exhibit 9: Representative Quotes From Network Staff Regarding Positive Impacts Of VISN-Level Service Lines

Category	Respondent's Job Title	Quotation
Guideline Implementation	Network Director	"We've had a very positive effect with guidelines – we've implemented a number of them, and done some great standardization. Our performance scores have improved significantly, as have our outcome measures."
	Chief Fiscal Officer	"Clinical policy development has been helped by bringing together groups that are knowledgeable and representative of all groups in particular area."
Uniformity of Care	Network Director	"Service lines have been very effective in reducing the variation of practice, leading to better and more cost effective care. The primary care service line has been very effective in standardizing delivery and way we do our work."
	Chief Medical Officer	"Care councils are impacting the uniformity of care across the VISN. This is why they are there. Like the policy for nursing home care. Another example is Hepatitis C where we make sure that the same level of knowledge is driving care at all care sites."
Care Coordination	Chief Medical Officer	"One of the problems in the past was that patients would be bounced from specialty to specialty – no internal communication. Now with one care line like med/surg, the one administrative officer can coordinate everything."
	Chief Information Officer	"Our patient satisfaction scores for coordination of care have gone up. We've made efforts, but it is the service line model that provided impetus to move things faster."
Cost and Utilization	Network Director	"People are looking at cost and utilization of mental health. Teams at some facilities are doing great work, and they are feeling supported by the emphasis on mental health [from the service line] ."
	Service Line Director	"We have dropped our costs per patient below the national average. Inpatient costs came down more quickly; there is no question that we have become more outpatient based. Our unit costs are all going down and we are becoming more efficient."
Access and Enrollment	Service Line Director	"In population coverage/access for general and specialized services, no network is doing as well. We have expanded access and continue to do well on these measures."
	Service Line Director	"We have increased utilization at our facility – an increased volume of patients and an increased number of patients in adult day health care."
Communication	Chief Medical Officer	"The change to me is that the groups that we have gotten together are working – two years ago they would have said, 'buzz off'."
	Chief Information Officer	"VISN service lines have enhanced our services immensely. We have communication and strategic planning at our finger tips. We are reducing duplication of services."
Competition	Service Line Director	"We took up a collection to bail out [a facility in financial trouble] . It meant $500,000 from us."
	Chief Medical Officer	"Effectiveness of our structure? A lot of contribution has been the breaking down of cultural barriers…as barriers come down, there is mileage to be gained."
Staff Motivation	Chief Financial Officer	"At the very basic level, we are having discussions that three years ago would have amazed me. At the strategic level there is unity of mission and awareness of interdependence – more patient focused than it was before."
	Facility Director	"When I came here in 1994 I would have said we would never make the changes we have. It has to do with the commitment of the people… The only way to gain control is to give up control. This is a difficult lesson for anyone who has been schooled in the VA. I am convinced that if I said we needed to move the building six inches, within a week I would have a committee who would have figured out how to do it."
Professional Issues	Network Director	"When special initiatives come, I am much better able to capitalize because I am now selecting the best people in network rather than the best in medical center; therefore, there is greatly improved professional development training."
	Service Line Director	"There is now an education council which is a resource to us. Their recommendations are based on the network's needs and not the individual staff person."

4.2 Facility-level descriptive findings

In this section we report findings based on our site visits to facilities and from the survey of facility directors. We will describe:

– when service lines were implemented at the facility level

– what forms they take

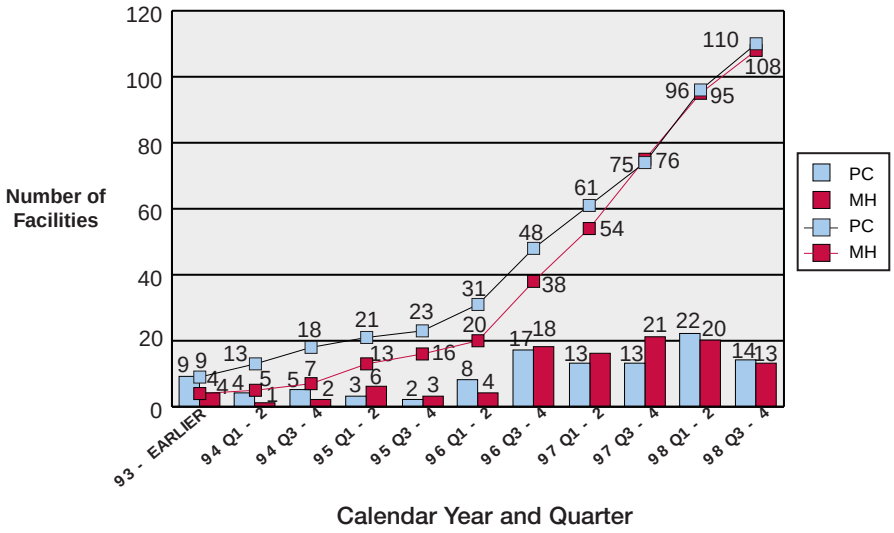
– their clinical focus

– the disciplines of the managers who lead them

– managers' perceptions of facility-level service lines.

In a small, but important, number of cases, the implementation of service lines at the facility level predated the reorganization of VHA and the formation of networks. Beginning in 1996, the numbers sharply increased. As is evident in Exhibit 10, several mental health and primary care service lines had been implemented by 1993, and service lines were implemented in a small number of additional facilities each quarter thereafter. Primary care and mental health service lines had each been implemented by over 100 facilities by the end of 1998, and only a small number of facilities had not implemented either type. This sharp upturn in 1996 is consistent with the accounts of many interviewees, who reported perceiving a "mandate" for service lines in Headquarters' policies and reports released at around that time.

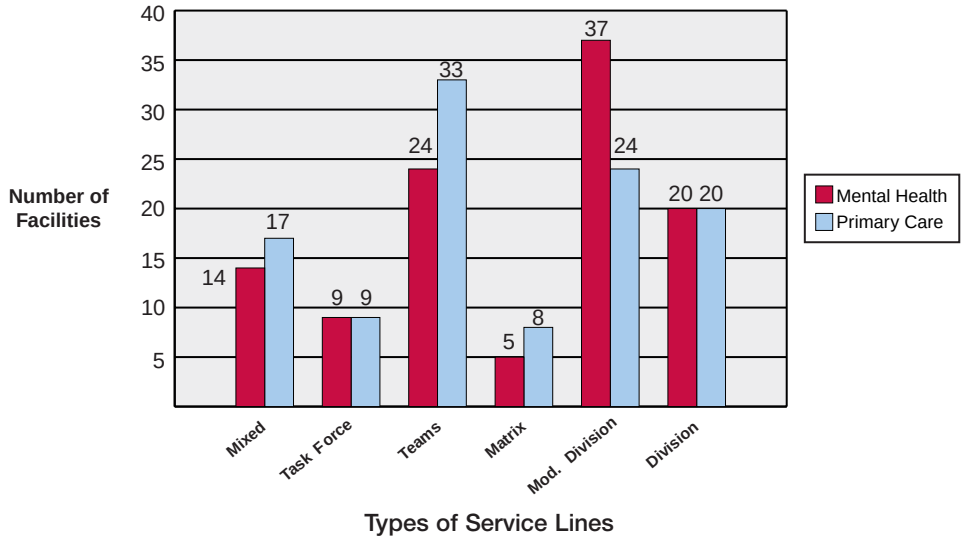
Exhibit 10: Start Dates of Mental Health and Primary Care Service Lines



We found wide variation in the organization of primary care and specialty care in service lines. In many facilities, these two areas were reported as separate service lines. In contrast, in others they were both part of a single ambulatory care service line or a medical/surgical service line. Thus, when comparing primary care service lines, it should not be assumed that all relate to specialty care in the same way.

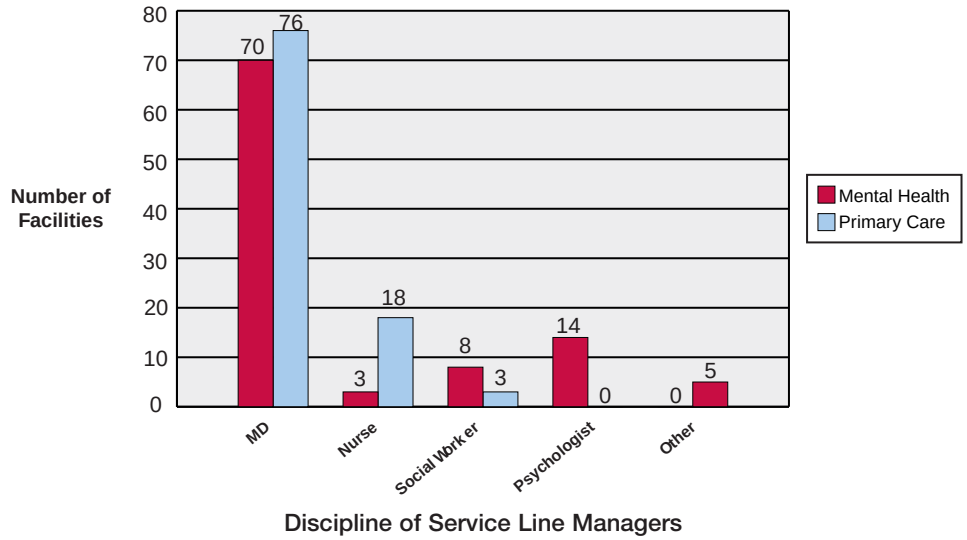
As expected, service line forms falling all along the Charns and Tewksbury (1993) continuum were reported. The distribution of different service line forms is depicted in Exhibit 11. Teams and modified divisions were the organizational forms reported most frequently, with mental health exceeding primary care in the use of the two most integrative service line forms. A number of facilities had service lines that could not be classified on the Charns and Tewksbury continuum because the reporting relationships of different disciplines within the service line varied substantially. We called these "mixed."

Exhibit 11: Structure of Facility-Level Mental Health and Primary Care Service Lines in 1998



Service lines also varied in terms of their leadership. Most service lines had a single individual serving in the position of service line manager. Fourteen of the 109 mental health service lines and nine of the 111 primary care service lines, however, were led by a dyad or by a larger group of individuals. Most often dyads consisted of a physician-nurse pairing, or a clinician-administrator pairing. Two reasons were reported for this: a desire to spread the workload of what was usually structured as a collateral duty, and an attempt to address skill coverage by choosing co-managers with complementary skills. The professions of service line managers in mental health and primary care service lines having single managers are shown in Exhibit 12. The greatest number of service line managers in both clinical areas were physicians. In mental health, there were also some psychologists and social workers in these roles. In primary care, the second most frequent disciplinary background for service line managers was nursing. The dominance of physicians in service line manager roles was consistent with the widespread belief expressed by many interview respondents that physicians are best suited to such roles.

Exhibit 12: Disciplines of Facility Primary Care and Mental Health Service Line Managers in 1998



In our site visits we found that service lines were often perceived positively by managers in the facilities. As the quotes in Exhibit 13 below suggest, managers believed that service lines improved communication, the dissemination of best practices, and financial accountability.

Exhibit 13: Facility Managers' Positive Perceptions of Service Lines

"I have the ability to communicate with people at a practical and direct level. I can facilitate communication and assimilate people's concerns."

"Dissemination of best practices is much quicker because information is no longer filtering down through the layers."

"It gives us a broader perspective and newer ideas."

"Service lines are empowered by having their own people and their own dollars. Each has a business manager to help run the service line."

"The business manager reports to the service line manager on day-to-day issues. Tension between the two promotes quality care and fiscal responsibility. The tension has worked quite well."

"It's a big change. Once you know there's not a blank check, rather than immediately replacing people you look to see if you can do it cheaper."

"I have had a social worker and a registered nurse who were trained in the addiction severity index (ASI) after the redesign. We now have had 100% and 99% compliance. Both of these people worked very hard to bring that about. I believe that it happened because of the shift - that they felt the incentive to perform."

"We've improved our relationship with the affiliate. Regardless of the changes, they are still able to hire high quality staff through medical school affiliations. We've made it better for our patients, even with the loss of staff."

However, such positive perceptions were not universal. Some managers were concerned that service line forms of organization could have unintended negative consequences. Such concerns are illustrated by the comments in Exhibit 14 below. These unintended byproducts might also cancel out any potential benefits.

Exhibit 14: Facility Managers' Negative Perceptions of Service Lines

"My theoretical concern is that you substitute one set of rivalries for another."

"We are losing our talent base because there is no training and development in specific functional areas like there used to be."

"Professional standards is one potential casualty of going over to care lines."

"I don't know that they [service lines] have had a major impact on practice. The professional staff has seen reductions in staff, which has resulted in service not being given in as timely a way as before. Since we have been able to retrain people … things have gotten better."

"When the shift happened to service lines, there was a lot of confusion and chaos in the process. There also was some reluctance to take on and respond to these new roles. Adding staff onto mid-level managers is a very challenging and almost unreasonable scope of responsibility. Under service lines you don't have the flexibility and economies of scale for coverage as under the other [traditional] organizational structure."

In some sites people felt that while a service line organization might be appropriate for the facility, problems in implementing service lines had undermined their efforts. For example, at one site service line managers indicated that Medical Administration Service (MAS) had assigned the poor performing and problem employees to the service lines, and kept the best employees for the core MAS function. Service line managers felt that this had handicapped them from the start. Ultimately, service lines were eliminated at this site. Thus, the effects of service line forms of organization often seemed to be confounded, at least in view of some facility managers, with the effects of the organizational change process undertaken to achieve service line implementation.

Many interviewees also indicated that service line managers did not have the training or skills in general management and in financial management needed for these new positions. Many of the physician leaders, who constituted the majority of service line managers, reportedly did not have extensive management experience or training. They were not sufficiently prepared to manage the multiple disciplines in their service lines, a skill that is generally developed through years of progressively increasing management responsibilities. Although some service line managers did obtain some management training, this was generally perceived as being insufficient for the requirements of the position.

Although several interviewees indicated that they were concerned that service lines would have a negative impact on professional standards and professional development, we did not have any direct evidence of this occurring. We did note ambiguity about some responsibilities in several instances when facilities eliminated professional departments and implemented service lines. For example, in one site Nursing Service had been responsible for maintaining the crash cart, and it was not clear where in the service line structure this responsibility should be assigned. We also observed a number of sites that implemented service line divisional structures, eliminating professional departments, only to reestablish lead professionals (e.g. lead social worker, nurse executive) or professional councils. Interviewees in those facilities indicated that the resulting modified divisional structures provided vehicles for addressing professional issues that could not adequately be addressed when they were structured in the pure service line divisional form.

4.3 Facility-level outcomes analysis findings

After excluding three sites that provided no inpatient care and one site that did not provide information on its service line structure, we were able to analyze data from 140 sites. Regression analyses were done, as well as descriptive statistics on improvements in outcome measures. The findings discussed below will first examine the effect of primary care service lines on patient-centered outcomes from Austin administrative databases and on customer satisfaction. Next, the effect of mental health service lines on the outcomes of users of psychiatric care in VA will be described.

4.3.1 Primary care service lines

We first examined the correlation between hospital characteristics and primary care service line structures. Two significant correlations were found. Teaching status was negatively correlated with presence of a service line divisional structure ($r = -.19$, $p<.02$), indicating that teaching hospitals tend not to be organized into divisional structures. Hospital size was negatively correlated with a service line manager having control over the service line's personnel budget ($r = -.17$, $p<.04$), indicating that such control occurs more often in smaller hospitals.

Organizational theory implies that as service lines become more highly developed, control by the service line manager over all facets of operations related to the service would increase. To explore whether this was true in VA medical centers, we compared service line continuum scores to control over budget. Only 25 of 110 facilities with primary care service lines indicated that the service line manager had control over the personnel budget; and, contrary to what theory would predict, control over the personnel budget was not correlated with the Charns and Tewksbury organizational continuum score.

Between FY97 and FY98 all measured primary care outcomes that we collected from the Austin databases as well as patient satisfaction improved nationally in VA. Primary care enrollment was up, bed days of care were reduced and other important measures also showed marked improvement. Regression analyses were then used to determine whether the presence or type of service line had an accelerative effect on the improvement in outcomes. We controlled for factors such as patient severity and hospital characteristics in these analyses.

Facilities that implemented primary care service lines did not have significantly greater improvement in primary care outcome measures than facilities that did not implement primary care service lines. In comparing all sites with service lines to all sites without service lines, we found no statistically significant positive differences in primary care outcome measures from the Austin databases. However, facilities with service lines had significantly less improvement than facilities without service lines on three measures: ambulatory care sensitive (ACS) condition hospitalization rates, urgent care visit rates, and the ratio of urgent care visits to total visits. We also found no statistically significant differences in improvement in patient satisfaction measures between sites with service lines and those without service lines.

When we took into account the specific organizational form and the duration of service lines, we found mostly negative effects of service lines on improvement in outcomes. As noted earlier, service lines differ greatly both in structural form and duration. Thus, we conducted a second set of regression analyses to account for these differences. The detailed regression results are reported in Appendix G and are summarized in Exhibit 15.

In these regressions we found that specific types of service lines had one positive significant effect on outcome measures from the Austin databases. Those facilities with a longer-duration (LD) service line team had significantly greater improvement in primary care enrollment than did facilities with no service line. However, we found that specific forms of service lines also had significantly detrimental effects on the improvements in other outcome variables. Specifically, shorter-duration (SD) service line task forces had significantly less improvement in reducing discharge rates. Facilities with SD service lines of team and division forms had significantly less improvement in the ratio of urgent care to total visit rates. Facilities with SD division and mixed service line forms reduced their ACS hospitalization rates less than facilities without service lines. Also, LD mixed service lines had reduced their specialty visit rate significantly less than facilities without service lines.

Service lines of different structural forms and duration had inconsistent effects on improvements in patient satisfaction. Facilities with LD mixed-evaluation service lines had significantly worse outcomes on six satisfaction scores, and a significantly better outcome on one score, "courtesy" (see Exhibit 15). All other types of LD service lines each had significantly better outcomes on one satisfaction measure. Finally, the effect of SD service lines was inconsistent, but mostly not significant, with SD task forces having significantly less improvement on emotional support, SD teams having significantly less improvement on overall coordination, and SD divisions having significantly more improvement on patient preferences.

Exhibit 15: Summary of Statistically Significant Findings Between Service Line Form and Duration and Hospital Outcomes

Service Line Duration	Service Line Form	Primary Care Quality and Utilization Outcomes	Mental Health Quality and Utilization Outcomes	Patient Satisfaction
Short-duration	**Task Force**	**(-)** Discharge rates	**(-)** Psychiatric Bed Day Rates **(-)** Acute Bed Day Rates **(-)** Hospitalizations with no prior primary care visit w/in 30 days	**(-)** Emotional Support
	Team	**(-)** Urgent care visits/total visits		**(-)** Overall coordination
	Division	**(-)** Ambulatory care sensitive hospitalization rates **(-)** Urgent care visits/total visits	**(-)** Urgent care visit rates	**(+)** Patient preferences
	"Mixed"	**(-)** Ambulatory care sensitive hospitalization rates		
Long-duration	**Task Force**			**(+)** Continuity of care
	Team	**(+)** Primary care enrollment		**(+)** Courtesy
	Division			**(+)** Patient preferences
	"Mixed"	**(-)** Specialty visit rates	**(-)** Readmission after hospitalization rates **(+)** Proportion of primary care visits after hospital discharge	**(-)** Access **(-)** Emotional support **(-)** Patient preferences **(-)** Patient education **(-)** Visit coordination **(-)** Overall coordination **(+)** Courtesy

(+) Indicates statistically significant finding of greater improvement in service line
(-) Indicates statistically significant finding of less improvement in service line

4.3.2 Mental health service lines

As in our analysis of primary care, we began analysis of mental health service lines by examining the correlations between hospital characteristics and mental health service line structures. We found statistically significant correlations between facilities located in VISNs experiencing a 5 percent gain in VERA allocation from FY97 to FY98 and the following variables: existence of a mental health service line ($r=.24$, $p<.01$), service line duration ($r=.18$, $p<.05$), existence of a team or committee ($r=.23$, $p<.01$), and divisional structure ($r=.32$, $p<.001$). These findings indicate that facilities in VISNs having the VERA gain were more likely to have mental health service lines, to have established them earlier, to use a team or committee to manage or advise the service line manager, and to be structured in a divisional form. In addition, the correlation between use of the team or committee and number of hospital FTEEs was significant ($r=.21$, $p<.05$), indicating that this approach was used more often in large hospitals. We also noted that in 27 facilities mental health service line managers had control over budget.

In contrast to the primary care outcomes, mental health patient-centered outcomes did not all improve between FY97 and FY98. Psychiatric and total acute bed day rates were reduced overall, and the proportion of psychiatric hospitalizations followed by a primary care visit within 30 days increased. However, fewer psychiatric hospitalizations were preceded by a primary care visit within 30 days in FY98 than in FY97, and urgent care visit rates for the psychiatric cohort were higher in FY98.

Facilities with mental health service lines did not have significantly different mental health outcomes than facilities without mental health service lines. However, several specific types of mental health service lines did have significant, and mostly negative, effects on these outcomes. As shown in Exhibit 15, facilities with SD service line task forces had significantly less reduction in both psychiatric and total acute bed day rates, and also had a significantly greater increase in the proportion of hospitalizations not preceded by an outpatient visit. Facilities with SD divisional service line forms had significantly less reduction in urgent care visit rates. Facilities with LD mixed evaluation service lines had significantly greater increases in readmission rates than did facilities without service lines, but also had a significantly greater increase than facilities without service lines in the proportion of hospitalizations followed within 30 days by a primary care visit.

5. Discussion

5.1 Overview of the findings

This study has generated several findings that are important both for practicing managers and for theory development. First, the study has revealed that there is no consistent terminology used to describe service lines and that simply questioning whether a facility or a VISN has service lines does not provide reliable information. All 22 VISNs have service lines but they vary widely in structure, clinical focus, and relationship to the VISNs' overall strategies. VA facilities also have implemented service lines extensively, with over 75% of all VA facilities having mental health and/or primary care service lines.

By providing a theory-based method for classifying service lines we have been able to distinguish among different service line forms and to determine that they have differing relationships to achievement of organizational goals. This approach has provided much richer findings than simply comparing sites with service lines to sites without them.

5.2 VISN-level findings

We have reported that the number of service lines at the VISN level is slowly growing. Among the networks, our findings have led us to begin to differentiate what appear to be four different patterns of service line adoption. In a few networks, such as VISN 2, VISN-level service lines are being used as the primary integrative device for the network and to drive VISN-wide reorganization. In a second group of networks, such as VISN 7, service line teams/councils are used to develop network-wide clinical policy and share best practices. In others, such as VISN 3, service lines are utilized as a mechanism for addressing only some specific clinical areas requiring network-wide management, coordination and sharing best practices across facilities. Finally, a fourth group of networks, such as VISN 20, implemented either service line task forces with limited charges or have not implemented service lines at all, but have instead utilized other integrative devices, such as the creation of regional sub-systems.

At the VISN level we found that the most positive perceptions of service lines were reported by managers in VISNs with the most extensively developed service line structures. This may reflect the impacts of different service line structures. Alternatively, it is possible that managers in VISNs with the most extensively developed service lines are more committed to the service line concept. As a result they perceive service lines more positively than managers with a lesser commitment to the concept. In fact, we are aware of some situations where managers who were not committed to the service line concept found positions in VISNs that were not extensively implementing service lines. Those managers remaining in the VISNs with extensive development of service lines were the people most committed to the concept.

Another possible explanation of the pattern of findings between VISN service line structures and perceived benefits is related to the change process. Interview data revealed that in some VISNs facility directors and chiefs of staff resisted the implementation of service lines. In situations where there was substantial resistance to service lines, it may not have been possible to implement team, matrix or divisional forms because they require that the facility leadership in VISNs give up some control to service line directors. Thus, while it is possible that the low level of perceived benefits of task forces reflects the limited integrative capacity of a task force, it may also reflect a strong resistance to change and the inability of a VISN to implement any more integrative service line form. This suggests a caution in interpreting the findings regarding task force structures.

5.3 Facility-level findings

We have reported higher proportion of the most integrative service line structures at the facility level than at the VISN level. We have also reported that mental health and primary care are the two most common areas for service line adoption.

We found that facility-level service lines have had little positive effect on important facility-level outcomes. We found a limited number of statistically significant relationships between service line structures and outcomes related to VA performance measures. Most significant findings did relate to both service line form and duration rather than to the simple existence or non-existence of service lines. Many of these findings indicated a negative relationship between outcomes and those service lines having a mixed form (i.e., those in which staff evaluations were conducted in highly inconsistent ways among the various disciplines). The second set of negative associations involves short-duration service lines. Only long-duration task forces, teams and divisions had statistically significant positive associations and no statistically significant negative associations with any outcome measures.

In reviewing the findings, we first note that there is no theoretical literature that discusses the mixed-evaluation service lines. We, in this study, are the first to report their existence. We have no direct evidence as to why they are negatively associated with outcomes, but believe that the inconsistency in evaluation processes may reflect one of three situations. First, it may result from resistance to change, where one or more service chiefs have resisted giving up personnel control, while other service chiefs have cooperated in the change. Second, it may reflect that the implementation of the service line is still in process, with shifts in reporting relationships evolving over time. Third, it may reflect medical center management's lack of understanding of the service line concept and permitting the substantial variations among disciplines. All of these possible causes would contribute to ambiguity about service lines among staff. The fact that the greatest number of statistically significant negative associations involved longer-duration mixed service lines may indicate that lasting ambiguity has a detrimental effect on organizational performance. The mixed evaluation processes may also convey a lack of commitment to the service line concept, leaving staff without clear direction as to what behavior is desired, and thus contributing to reduced performance. While we do not yet know the mechanisms by which the mixed service line structures may be associated with lowered performance on key measures in VA, we do note their strong negative relationship and caution against their use.

After accounting for the mixed-evaluation service lines, the remaining statistically significant negative associations between outcomes and service line form and duration occur with shorter-duration service lines. We believe that these results reflect the turbulence of the change process. Although we thought that we had accounted for such turbulence by categorizing service lines of less than seven months duration together with the non-service line sites, the period of negative effects of the change process appear to last longer. This may reflect the time needed for implementation before positive effects of service lines begin to accrue. The negative effects associated with transition to service lines may be underestimated in the literature, and the findings of this study raise caution to VA managers. We also have found few statistically significant positive associations between longer-duration service lines and VA performance measures. We suggest that VA managers carefully consider whether the long-term benefits of service lines will outweigh the apparent short-term negative impacts.

Confusion about whether effects were related to service lines or to the implementation process was manifested by many of our interviewees. Responses to questions about service line effects often included more general comments about the difficulties of the change process. This also reflected the fact that VHA facilities were simultaneously undergoing multiple change processes. As noted above, we have seen strong negative associations between short-duration service lines and outcomes, consistent with the turbulence of the change process. Similar to what we discussed at the VISN level, in some facilities service chiefs and other managers strongly resisted service line implementation and in some cases were able to sabotage the change process. In situations where there was substantial resistance to service lines, it may not have been possible to implement team, matrix or divisional forms because they require that the service chiefs in facilities give up some control to service line managers. Thus, as in interpretation of the VISN-level findings, the relationships between task forces and outcomes may not reflect causality involving the structure of the service line but rather a strong resistance to change.

Through site visits we have also learned that there are substantial other barriers to implementation of service lines. These include the VA personnel system, that does not facilitate classification of service line managers at grade levels that attract highly qualified personnel; a lack of skills and training in general management and financial management for service line managers; and a lack of cost accounting information needed to provide budget responsibility and authority to service lines.

5.4 Discussion of overall findings

Overall, the study has revealed a more positive impact of service lines in VISNs than in facilities. This may reflect several different factors. First, these findings concern service lines at two different levels of analysis. Thus, it is possible that VISN-level service lines are having a positive effect at the same time that facility-level ones are not, because the relevant goals and outcomes, as well as the contextual factors such as physical proximity of individuals, may differ. Second, the methods of analysis of the VISN-level and facility-level service lines differed. We had facility-level quantitative outcomes, but we did not have VISN-level quantitative outcome data and we relied exclusively on qualitative data. Third, time lags between service line implementation and potential effects on objective outcomes may also be an issue.

In comparing VA service lines to those in the private sector, we note that they differ in both scope and clinical focus. The most common private-sector service lines at both the facility and network levels are in cardiology, oncology, and women's health, followed in prevalence by mental health and geriatrics/long-term care. In many cases in the private sector, the primary purpose of these service lines is to market services. Both the private sector and VA are driven by environmental factors; yet those environments are still quite different and thus the pressures are different. For example, third party payers are often cited as driving influences behind the creation of disease-specific service lines in the private sector. There are very few private-sector primary care service lines, a reflection of the relative independence of physician office practices in the private sector. The broad scope of VA service lines in areas such as primary care and acute care may inhibit their effectiveness. One of the underlying reasons postulated for service line effectiveness is the focus they provide on a limited area of an organization's outputs. This theoretical advantage is difficult to reconcile with broadly defined service lines.

In our site visits some interviewees believed that service lines conflicted with their medical centers' academic missions. Other respondents, however, believed that the interdisciplinary nature of service lines contributed to their research productivity. Although we do not have any direct evidence on the relationship between service lines and academic productivity or outcomes, we have observed the conflict between the service line structure and the medical school organization. Some respondents questioned whether the service lines were not just new silos that would fragment care. Having both primary care and specialty care service lines divides physicians in the medical school's department of medicine. This problem is not unique to VA, however. In academic health centers in the private sector, service lines in areas such as cardiovascular diseases and cancer care involve physicians from different specialties, and thus different medical school departments. While some service lines bring together physicians from different specialties, some also fragment departments such as medicine and surgery. Creating narrow, disease focused service lines results in fragmentation within the departments of medicine and surgery to an even greater degree than the broadly defined service lines implemented in VA.

The majority of VA service line managers are physicians, while in the private sector most service line managers are non-physicians. We believe this reflects the fact that physicians are employed by VA, but few physicians are employed by private-sector health care organizations. This provides VA an advantage over the private sector since a major challenge faced by service line managers is getting physicians involved in their operations. However, this also brings challenges to VA, as many VA service line managers are not well prepared to manage the financial aspects of service lines or the multiple disciplines involved.

5.5 Limitations of this evaluation

Although this study has several important findings, it also has several limitations. First, at the VISN level, service lines that have developed beyond the point of task forces are still quite new and thus have had very little time to generate any measurable effects. The development of service lines at the VISN level simply did not progress as rapidly as we had anticipated they would at the beginning of the study.

Second, at both the VISN and facility levels, service line implementation has occurred in the context of multiple changes, which may confound any potential effects. For example, the overall trend toward improvement on many measures may overwhelm any discrete effect linked to service lines. We have attempted to control for facility differences in terms of characteristics such as size and patient population, but have not directly assessed other strategies such as integrations or creation of regional sub-systems within VISNs. We also have been unable to assess the joint effects of VISN-level and facility-level service lines. Also, the initial disruption of these multiple change processes (including implementation of service lines) may offset any positive effects attributable to service lines.

Third, categorization of a variety of organizational arrangements as "primary care service lines" may cloud important variations and limit significant findings. Primary care service lines are actually quite heterogeneous. Some include only out-patient primary care, some include all out-patient care, some encompass all medical care, and some primary care service lines are part of larger medical/surgical service lines that include all general medical and surgical care provided by a facility or network.

Fourth, the measures used in our analyses to assess potential service line benefits may not be sufficient. It may be important to develop additional measures related to VA performance goals, as well as to examine outcomes in clinical areas other than primary care and mental health. In addition, using the change in performance over the period of one year in a cross-sectional evaluation design may have resulted in a very conservative analysis of effects; it is necessary to include multiple years of outcome data to reliably detect any effects.

However, this study does provide the first large-scale empirical findings of the effects of service lines on achievement of organizational goals. It has revealed that different service line forms have different effects, as well as the negative effects of implementing the new structures. The study has also shown the different patterns of use of service lines at the VISN level and the initial perceptions that the task force structures are associated with the fewest advantages and the division structures with the most advantages. These results suggest that the task force structures at both the VISN and facility levels should not be utilized, and that managers must carefully weigh the negative impacts of change against potential gains to be achieved through service line restructuring. The findings also suggest that further study would be beneficial in developing and testing our understanding of these phenomena.

6. Agenda For Further Evaluation

To develop a fuller understanding of service lines in VA, their implementation, structural variations and their effects, it is necessary to continue to monitor both facility-level and VISN-level service line implementation and outcomes over time. At the VISN level, effects cannot be expected until after the service lines are well established. As discussed earlier, from our experience with the facility-level service lines, we conclude that this will require additional data collection, through FY03. This time period will allow the investigation of the effects of service lines in VISNs 1, 5, 10, and 13, which now in FY01 are just evolving into their intended forms, in addition to the established service lines in VISN 2. These additional analyses should include not only the outcomes measured at the facility level aggregated to the VISN level, but also additional VISN performance measures. Furthermore, analyses should include additional clinical areas in which service lines have been implemented, such as extended care and acute and specialty care.

Second, we need to develop a better understanding of the findings at the facility level. The mixed-evaluation service lines are remarkable in their negative relationships to outcomes. The small number of statistically significant positive associations involving longer-duration service lines is also remarkable. We must determine whether in fact there is not a relationship or whether measuring the change between FY96 and FY97 represented only a portion of the total change over time. Similarly, the lack of findings regarding control over budget was surprising and requires further investigation. Although some managers felt that service lines' control over budget was critical, quantitative analyses did not bear this out. We have observed several variations in the organization of primary care service lines, for example whether they are free standing or part of a larger service line. These variations also require further investigation.

Facilities are also continuing to implement service lines in primary care, mental health, extended care, and to a limited extent other more focused clinical areas such as diabetes and SCI. These data need to be examined in a longitudinal analysis that looks for both anticipated negative effects on outcomes that appear to follow initially after service line implementation and positive effects on outcomes that might appear one to three years after implementation.

We have continued to obtain information on facility-level service line implementation through a fax-back survey. We are currently validating those data. We propose to continue those data collection efforts to build the longitudinal database. We also have constructed a combined database that includes the last five years of customer satisfaction data and we propose to construct a similar database from archived data from Austin. Thus, in addition to the proposed prospective analyses, knowing that a number of service lines have been operating in the facilities for several years, we will first examine facility outcomes retrospectively over the last five years. In these analyses we will examine not only service line effects but also the effects of other factors such as facility integrations and their interactions with service lines.

Third, the analyses to date have not addressed how service lines may affect medical center staff nor obtained direct measures of their perceptions of medical center and VISN functioning. As part of another project we surveyed staff in all medical centers in 1997 regarding medical center culture, emphasis on Baldrige quality dimensions, and alignment of organizational rewards with quality goals. We have readministered these surveys in 1998 and 2000 and added measures of VISN integration, emphasis on professional values and staff satisfaction. We propose to examine the relationships between these measures and service line implementation. This will provide information on whether service lines are associated with perceived VISN integration, whether they have a negative effect on emphasis on professional values, and whether there is a relationship between service line implementation and staff satisfaction.

Finally, the site visits conducted in this study have provided descriptive information useful both for interpretation of the quantitative analyses and for informing managers throughout VA about the changes that are occurring and how different medical centers, service lines and VISNs are managing these changes. We propose to continue these efforts and to continue reporting our observations throughout VA through vehicles such as *Transition Watch*. Implementation of large-scale change, such as service lines, cannot be understood through observations at one point in time. Through continued site visits we will be able to observe and report on the dynamics of change.

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APPENDICES

Appendix A: Basis for Service Lines in Organizational Theory

A fundamental issue for large, multi-product or multi-service organizations is how to group jobs and responsibilities into an organizational structure. Although there are industry-specific variations in the terminology used to characterize the alternatives, organizations in both manufacturing and service industries face the same fundamental issue: whether to group individual jobs based chiefly on the function that individuals perform (i.e., the inputs of the organization) or on the product/service they provide (i.e., the outputs of the organization) (Szilagy and Wallace, 1983). In health care, organizing around the inputs to the care process yields a structure of departments, each consisting of individuals in the same discipline or profession. Organizing around a hospital's outputs creates service lines consisting of people in different disciplines and professions who have a common purpose of producing a comprehensive set of clinical services (e.g., heart care, cancer care). Before directly examining these alternative forms of organization in health care, it is important to understand the general theory of organization design.

A discipline/professional structure[4] groups jobs according to professional discipline or area of labor specialization. This is the traditional way to organize jobs. In manufacturing industries the disciplines or specialties correspond to the functions of research, design, manufacturing, marketing and sales. In health care, there are many more distinct disciplines and professions, such as nursing, social work, physical therapy, and pharmacy. Theoretically, the primary advantage of a discipline/professional structure is that it permits economies of scale through the pooling of resources within each department (Jennergren, 1981). It also allows individuals performing the same job to learn from one another for better productivity and greater professional identity and professional development (Charns and Tewksbury, 1993).

For multi-product organizations in manufacturing, a discipline/professional structure has substantial limitations. In particular, individuals whose combined efforts are required to produce any given product (e.g., those from manufacturing and sales) are separated organizationally, which can impede their ability to coordinate work efforts. Each department develops a focus on the function it performs and the inputs it provides to the organization without having a perspective on the totality of any product or service produced or the external consumers of those products or services. Also, discipline/professional structures present great information processing demands (Galbraith, 1973) for top managers, whose performance may be hampered by the vast amount of operating data they need to track and monitor.

The product/service line divisional structure offers a distinct alternative to the discipline/professional departmental design. Product line management has its roots in the manufacturing sector. After World War II, many U.S. manufacturing firms began to grow in size by diversifying into multiple lines of business (Fligstein, 1985; Hall, 1978; Williamson, 1975). Because traditional centralized structures based upon discipline/professional departments often proved inappropriate for managing this diversity, many firms reorganized job positions along separate lines of business. This entails the creation of distinct divisions for each particular product/service or set of related products/services. For example, General Electric created distinct divisions for each of its diverse areas of business activity, such as consumer products, industrial equipment, and capital equipment financing. Each division consisted of all of the professions and disciplines needed to develop, manufacture and sell the division's products.

In theory, the product/service line divisional design promotes effective working relationships and allows for greater role flexibility across disciplines and professions. Moreover, in a product/service line divisional structure, decision making typically is decentralized to the divisions, which reduces information-processing demands on top managers at the corporate level.

However, the product/service line divisional design has its own limitations. The most problematic is the loss of economies of scale due to greater difficulty in sharing staff and other resources among divisions. In addition, this structure fragments the organization among product/service lines, introducing competition and barriers to collaboration and coordination among the different divisions. This limitation is most critical when the work of the different divisions is highly interdependent, such as when they serve the same customers.

[4] This is commonly called "functional organizational structure" in the organizational literature. The more descriptive term "discipline/professional structure" was chosen for clarity in this report.

Theoretically the discipline/professional departmental structure and the product/service line divisional structure represent mutually exclusive alternative ways of organizing. However, Lawrence and Lorsch (1967) noted that organizations often require the attributes of both forms. They further noted that the need for integration of the disciplines and professions increases as the uncertainty of the organization's work increases. They observed that organizations used a variety of mechanisms to integrate the efforts of their diverse discipline/professional departments.

Galbraith (1972) built on the work of Lawrence and Lorsch (1967) to delineate further a variety of intermediate organizational structures that combined the features of the pure discipline/professional and product/service line forms. Galbraith (1972) conducted his work in the aerospace industry, which was characterized by a high level of uncertainty. Effective organizational performance required both state of the art contributions from experts in diverse disciplines and professions (inputs), and coordination of those contributions for optimal product design, manufacturing and sales (outputs). For example, Galbraith (1972) noted that in design of the Boeing 747 aircraft, complex tradeoffs were needed among the designers of different components, many of whom were working at the frontier of knowledge with new materials, design concepts, and manufacturing methods. These decisions could not be made independently of one another, nor independently of the needs and desires of the marketplace. Thus, to address the organizational requirements of maintaining specialization of each discipline and profession while attaining the required level of integration, organizations successively implemented intermediate structures.

Galbraith (1972) characterized these structures in terms of their increasing capacity to provide integration among the diverse disciplines and professions: liaison roles and integrators, integrating departments, task forces, teams and a formal matrix structure. Each structure provides to a different degree a mechanism for coordinating among established functional departments to accomplish product-related goals. For example, product teams comprised of staff from different discipline/professional departments can work together to design, produce, and market a product or family of products. Thus, both Lawrence and Lorsch (1967) and Galbraith (1972) noted that the design choices of discipline/professional departments and product/service line divisions were not the only alternatives, and that features of these organizational models could be combined.

Appendix B: Evaluation Methodology

VISN-level service lines

The development and analysis of case study data is very useful in understanding phenomena, such as service lines, that exist at multiple levels of analysis (Yin, 1994). This method is also appropriate for initial investigations because it can produce comprehensive descriptions of phenomena that were not previously well understood. The collection of case study data is driven by a structured protocol that specifies the topics and likely sources of information for the constructs of interest.

Thus, site visits were planned around interviewing key informants in each VISN who, by virtue of their positions, would be most likely to have the required information. These key informants typically included the network director, chief medical officer, chief information officer, chief financial officer, and any network-level service line directors or task force chairs. In 1997 site visits were conducted at all 22 VISNs. Interviews were conducted using a semi-structured interview guide [Appendix C] to ensure consistency with regard to scope and comparability for the interview topic domains. The interview guide focused on service line development and organization, other integrative efforts, and the change process in general. Specifically, questions concerned the development of network-level service lines (if any), how they were structured, service line directors' control over budget, service line activities, and perceived positive and negative effects. In addition, interviewees were asked about the utilization of other approaches to network integration, and how changes had progressed and been managed in the VISN.

Consistent with good interviewing practice, interviews were conducted by two members of the research team, one conducting the interview, with the other taking notes into an interview data entry document on a laptop computer. The presence of two interviewers provided a useful quality check, as both reviewed the interview notes for completeness and accuracy. When complete, interview notes were placed in a database program (Access), making it possible to search the database for interview responses that pertained to certain variables (e.g., service line budgets) or to certain networks. Thus, responses from multiple interviewees could be comparatively analyzed relative to specific interview areas or could be grouped for analysis by respondent role or discipline.

During the interviews, respondents often referenced documents such as strategic plans, organizational charts, and executive leadership committee agendas and minutes. Whenever possible, the interviewers obtained copies of these documents so that the data available for each VISN included not only interview notes, but also a variety of archival documents.

Site visits also included visits to two or three facilities within each VISN. These visits were designed to further our understanding of the interaction, if any, between facility-level and VISN-level service line development. Interviewees at the selected facilities included facility directors, associate directors, chiefs of staff, chiefs of nursing, and service line managers. Theoretical sampling guided the selection of the facilities for these visits. The principles of theoretical sampling suggest that variation in the sample can be obtained by purposive selection of cases that, based on theory, would be predicted to differ on the variable(s) of interest. Thus, within each VISN, facilities were chosen that were expected, based on characteristics such as size, location, and teaching status, to have different experiences with service lines.

During the fourth quarter of FY1998, follow-up site visits were conducted in a sampling of eleven VISNs. Sites selected for the 1998 visits were those in which much service line activity had been reported during the 1997 site visits plus a sample of the remaining VISNs. The interviews were conducted using a slightly modified version of the 1997 interview guide. Follow-up visits were also conducted in 1999. Sites selected in 1999 were those that continued to report high levels of service line development as well as those that had not been visited in 1998.

In addition, VISNs that had not been visited in 1998 or 1999 were interviewed by telephone to collect basic information about the clinical foci and organizational forms of current and planned VISN-level service lines. This enabled the research team to maintain the broad picture of what was developing in each VISN while also collecting detailed descriptive data from the selected VISNs.

Variables and analysis

The analysis of the interview data occurred in several steps. Short case studies of each VISN were developed, incorporating multiple perspectives from the interviews, as well as data from other sources pertaining to each VISN (e.g., VERA status, performance measures). In these case studies, emphasis was placed on not only describing how the organizational form of the VISN was developing, but also in representing the logic that appeared to underlie these developments. Data were also compared across VISNs, initially in summary tables that indicated the reported service line developments by each VISN. Generalized themes, such as the effect of reorganization on the professions, were also identified, through the process of constant comparative coding (Glaser and Strauss, 1967). Each theme, once identified, was looked for in subsequent coding, and also was used in subsequent re-coding of previously coded data. Data that suggested important areas to focus on in subsequent data collection were also highlighted as an input to other research steps, such as survey development.

An additional analysis of the interview data concerned the frequencies of positive and negative attributions about service line effects made by interview respondents in the ten VISNs visited in 1999. Two raters independently read each interview and coded positive and negative comments made by respondents about nine specific areas of possible service line impact that had emerged in the initial thematic coding described above. These nine areas were: guideline implementation, uniformity of care, care coordination, cost and utilization, access and enrollment, communication, reduced competition, enhanced attention to professional issues, and staff motivation. For example, if the interviewee said "transfers of patients between facilities is easier to accomplish," the care coordination category was coded positive. Additional positive comments by any individual interviewee did not increase the value of a category. Coding of negative attributes was treated similarly. Negative comments did not cancel out positive ones. Thus, for each interview, each category was coded in two ways: a positive comment was or was not made, and a negative comment was or was not made. Discrepancies between the two coders were resolved through coding conferences. For each interviewee the total number of categories having positive responses was tallied, and the total number of categories having negative responses was also tallied. The average numbers of positively coded categories and negatively coded categories were calculated for each VISN by averaging the number of positive and negative tallies from the set of interviews from that VISN.

Facility-level service lines

Our initial information on service lines at the facility level was derived from the facility interviews conducted during the site visits described above. Given that the site visit data represented only a sampling of facilities, our next step was to collect systematic data on service lines in all facilities. Since site visit data revealed that more service lines were in primary care and mental health than any other clinical area, we focused our efforts and analysis on those two clinical areas. While there were also many service lines in extended care/geriatrics, they were less prevalent than primary care and mental health and there was not agreement on appropriate outcome measures for them.

A telephone survey instrument, designed for administration to facility directors or their designees, was developed and pilot-tested in a sample of facilities. Facility directors were asked to report any service lines in operation at their facilities, and in cases where mental health and/or primary care service lines existed, to refer the interviewer to the corresponding service line manager for further specific information about the service line. One difficulty noted in the pilot administration was in establishing telephone contact with survey respondents; this turned out to be extremely labor-intensive. Data from the pilot surveys were compared with information obtained in 1997 facility site visits as a quality check. There were many mismatches in reports about whether or not service lines existed in a particular clinical area. Through subsequent inquiry, clarification of these mismatches revealed that the pilot survey data were consistently faulty.

From this, we learned that reliable responses could not be obtained if managers were simply asked to identify "service lines." The reason for the lack of reliability is that the term "service line" is not used consistently, and an organizational arrangement that some individuals would identify as a service line, others would not. In particular,

some individuals did not consider the appointment of service line managers, task forces or teams to be service lines; for them, only service line divisions were true "service lines."

However, we were interested in investigating the whole range of service line forms theorized on the Charns and Tewksbury (1993) continuum. Therefore, as shown on the first page of Appendix D, we defined and used the term "interdisciplinary organizational arrangements (IOAs)" in our survey in order to avoid the particular connotations of the term "service line." After limited pilot testing of this new form, which was designed as a mail-out, fax-back survey in order to maximize participation, the new survey was implemented.

Survey implementation

Between October and December of 1998, the survey (Appendix D) was sent to the directors of all 144 VHA facilities, along with instructions to fax the survey back to the investigators. Non-respondents were called and asked to return their surveys. 143 of the 144 surveys were returned. Three sites were removed from the sample because they were atypical or were outliers. Thus, 140 sites were available for analysis. Structural characteristics of facilities differed in terms of size, teaching status and facility type.

From the facility survey, we were able to collect detailed information regarding mental health and primary care service lines, respectively. As shown in Appendix D section 3, respondents were asked, "Is there a manager resposible for the primary care interdisciplinary organizational arrangement (PCIOA)?" and "Is there a team (i.e., dyad, triad, or quadrad) or committee responsible for management of the PCIOA?" A dichotomous variable was created, with 1 indicating existence of a service line[5] if respondents indicated a primary care IOA in section 1 and said in section 3 that they had either a manager or a team or committee responsible for the service line; otherwise it was coded 0. An analogous process was used to code the mental health IOA data.

To determine the classification in terms of the Charns and Tewksbury (1993) continuum of a mental health or primary care IOA in a particular site, we asked respondents to identify who was responsible for evaluations of key staff in the service line (See Appendix D). These staff were physicians, nurses, social workers, psychologists (in mental health) and clerical staff (medical administration service). From the literature, we anticipated that the reporting relationships and thus the evaluations would be consistent among the different personnel in a service line and that the information on evaluations could be mapped to the continuum as follows:

Evaluation	**Charns & Tewksbury Continuum Value**
Discipline responsible without input from service line	2 - 4 service line manager through task force
Discipline responsible with input from service line	5 - 6 reorganize departments through team
Discipline and service line jointly responsible	7 matrix
Service line responsible with input from discipline	8 modified service line division
Service line responsible without input from discipline	9 service line division

[5] Throughout this document, the term service line is used to denote any interdisciplinary organizational entity focused on a specific area, ranging from temporary task forces to divisions with line and budget authority. Although this is broader than the VHA definition of service lines, it is consistent with the other term we have used, interdisciplinary organizational arrangement (IOA), and is also consistent with common usage of the term outside VHA. The term IOA appears in this report only in the discussion of survey items and responses in which this specific language was used.

Since the sample size of 140 sites limited the number of variables that could be entered into the analysis, continuum scores were aggregated into three service line groups in addition to no service line:

2-4 Service line manager/task force (Hereafter referred to as "task force")

5-7 Team/matrix (Referred to as "team")

8-9 Divisions

These were represented by three dichotomous variables, with the reference group being no service line.

We also used dichotomous variables to indicate the relative duration of each service line. Respondents were asked to give the date when the original service line manager (if there was one) was appointed and the date when a team/committee (if there was one) was first convened (See questions 17 and 19 in Appendix D). The earlier of these two dates was used as the start date for the service line.

Although the data from the facility survey were compiled in December, 1998, we were interested in relationships between service lines and outcomes from FY98. Therefore, if a service line had not been commenced by October 1, 1997, corresponding to the beginning of FY98, it was not considered to be a service line for purposes of our analysis. As a result, all service lines analyzed in this project had been implemented at least by the beginning of FY98 and 7 months prior to the index patient visit for the patient satisfaction data (see following section). In addition, because the duration of the service line might also influence the effect on outcomes, service lines were further categorized as "longer duration" (LD) or "shorter duration" (SD). LD service lines were those that had been implemented prior to May 1, 1996. This date corresponded to 24 months prior to the index patient visit for the patient satisfaction data, and 17 months prior to October 1, 1997. SD service lines were those implemented on or after May 1, 1996 and before October 1, 1997.

Finally, we also asked who controls the service line personnel budget (For example, see question 23 in Appendix D). For each service line this was coded as a dichotomous variable, with 1 indicating that the service line manager controls the personnel budget and 0 otherwise.

Survey data analysis

Organizational data were initially analyzed to construct the service line continuum scores. Of the initial 110 sites that were identified as having primary care service lines in December 1998, 37 sites had implemented their service lines since October 1, 1997. These were re-coded as having no service line. Of the remaining 73 sites, responses to evaluation of personnel for the four different disciplines were completely consistent in only 20 sites. In some cases, only one discipline differed from the others by a single point. In other cases two or more disciplines had responses as different as 1 (evaluation done by discipline only with no input from service line) to 5 (evaluation done by service line with no input from discipline). We developed a set of decision rules to determine the continuum score from the four evaluation items (See Appendix E). When there was a discrepancy among the scores that we could not resolve in any theoretically consistent manner, we coded the continuum value as "mixed." This was reflected in an additional dichotomous variable coded as 1 for mixed and 0 otherwise. A similar categorization process was used for the sites reporting mental health service lines.

Relationship between facility-level service lines and outcomes

In addition to describing and quantifying the development of service lines at the facility level, one of our main goals in this study was to determine whether service line management is more successful in achieving the goals of VHA than are other management strategies.

Development of measures

The assumption that underlies our evaluation of the effect of service lines is that the goal of the VA health care system is to improve patient care and outcomes. Thus, if service lines are in fact more successful in achieving VHA's goals, facilities that have implemented service lines should have better patient-centered outcomes than do facilities without service lines. Thus, to assess the effect of service lines, we should judge them based on outcome measures that reflect VA health care system goals. We believe that the general VA goal of improving patient care is translated into specific, measurable outcomes by the network directors' performance standards. Thus, to develop outcome measures, we examined all performance standards for correspondence with two criteria we deemed necessary for this study. First, for feasibility of repeated evaluation over time, outcome measures should be available in administrative databases. Second, there should be clear mechanisms by which the organizational structure of service lines would affect these measures. Outcomes that would not be affected by service line implementation would not be good measures by which to judge service line performance.

For both mental health and primary care service lines, evaluation outcome measures were chosen that were related to the performance standards, were accessible through administrative databases, and could be affected by the implementation of service lines. The outcome measures selected for analysis are listed below. "NDPS" indicates those measures that are Network Directors' Performance Standards. All other measures used are derived from concepts embedded in the NDPS. For example, both discharge rate and multi-stay rate are linked to overall bed days of care.

Primary Care and Mental Health Service Line Outcome Measures

Primary Care Service Lines	Mental Health Service Lines
1. primary care enrollment (NDPS)	1. total acute bed-day rate (NDPS)
2. acute bed-days of care (NDPS)	2. acute psychiatric bed-day rate
3. proportion of users with at least one hospitalization	3. proportion hospitalizations without prior primary care visit within 30 days
4. discharge rate	4. proportion hospitalizations without primary care visit within 30 days after discharge
5. multi-stay rate	5. 30 day readmission rate
6. ambulatory care sensitive condition hospitalization rate	6. urgent care visit rate
7. specialty visit rate	
8. urgent care visit rate	
9. urgent care visits per total visits	
10. customer service standards (NDPS) - includes 8 measures of patient satisfaction	

Data on outcome measures #1 through #9 for primary care services lines and #1 through #6 for mental health services lines are available at the facility level through administrative databases housed in Austin, Texas. Databases used in the analysis included the Outpatient Clinic File (OPC), and the Patient Treatment File (PTF) for inpatient data.

For the primary care outcome measures, a cohort of all unique users of VA health care services during fiscal years 1997 and 1998 was constructed. Users were excluded if they did not reside in the 48 contiguous states or Puerto Rico. No inpatient VA facilities are available in Alaska or Hawaii, and thus there are no measures of inpatient use by veterans for these facilities. In addition, all non-veterans were also excluded.

For the mental health outcome measures, we defined a cohort of all unique users of VA mental health services for fiscal years 1997 and 1998 using the above criteria, with the additional requirement that the veteran had used VA mental health services. Thus, to be included in the cohort, users must have had at least one hospitalization that included a stay in a psychiatric bed section, or 3 or more outpatient clinic visits to a psychiatric clinic.

Data for outcome measure # 10 for primary care service lines were obtained from the annual survey of veterans conducted by the VA National Performance Data Feedback Center (NPDFC). The NPDFC ambulatory care satisfaction questionnaire is a paper-and-pencil self-report instrument designed for mail administration and is an adaptation of an instrument developed by researchers at the Picker Institute (Cleary, Edgman-Levitan, Roberts, Moloney, McMullen, Walker and Delbanco, 1991) and widely used in the private sector. The questionnaire consists of 70 multiple-choice items plus an open-ended comment solicitation. These items represent 10 dimensions of ambulatory care: access, emotional support, [attention to patient] preferences, information/education, continuity of care, visit coordination, overall coordination, courtesy, specialist care, and pharmacy. The last two dimensions were not used because they were new survey areas in 1998 and thus no change could be computed, and also because they are not conceptually related to the existence of a primary care service line.

Scale construction, selection criteria, sample sizes and methods of distribution of the customer satisfaction survey are reported in Appendix F. An overall response rate of 70% was attained. The patient satisfaction measure could only be used to assess primary care service lines, as the patients surveyed had not necessarily made any use of mental health services.

Analysis

We used multivariate regression analysis to assess whether facilities with service lines had greater improvements in these outcome measures than did facilities without service lines. The dependent variable in each regression model was the change in a facility-level outcome measure between FY97 and FY98. We chose to use the change in outcome measures for a few reasons. First, many of the network directors' performance standards are written in terms of improvements in the standards (e.g. increase in primary care enrollment). In addition, using the change over time in outcomes allows us to control for the fact that different facilities had previously obtained different levels of achievement in these outcomes. Using change measures, we can control for starting levels, and thus better determine the effect of service lines. In all, 23 outcome measures were analyzed: 17 to assess effects of primary care service lines and 6 to assess effects of mental health service lines.

Regression analyses were done for each outcome variable using two different sets of explanatory variables. Explanatory variables included both service line presence and characteristics. The first analysis simply compared the change in outcome measures in facilities with and facilities without a service line. The second analysis explored the effect of service line characteristics and duration on the outcome variables measured. From the survey (see preceding section, "Survey implementation," for categorization of service lines to continuum scores), each facility service line was categorized as a task force, a team, a division, or mixed. In addition, each service line was categorized as short duration (SD) or long duration (LD). Thus, for the second analysis of each outcome variable, facilities were categorized as having no service line or having one of 8 types of service lines (4 categories of service line form x 2 categories of duration). Theory predicts that organizational units which control their own budget may have better performance and cohesion than units that do not have budget control. Thus, in this analysis, a variable indicating whether the service line manager controls the personnel budget was also included.

Previous research has shown that various organizational characteristics affect VA medical centers' performance on patient outcome measures. Since we want to isolate the effects of service lines, a number of control variables were also included in the regression analyses. The data for these variables were obtained from internal VA databases. Control variables included structural data regarding hospital characteristics of size, teaching status, hospital type, geographic location and VISN financial change. Size was coded in terms of number of inpatient beds. Facilities were regarded as being a teaching facility if the hospital was a member of the council of teaching hospitals. Hospital type indicated whether the facility was a general hospital, psychiatric hospital and/or residential facility. The geographic locations of facilities were indicated by variables for the northeast, mid-west, south and west regions. Recent financial changes were captured by variables indicating whether the VISN in which a facility was located had gained or lost 5% of VERA (Veterans Equitable Resource Allocation System) allocation between FY97 and FY98. Finally, the following patient characteristics were included as facility level averages: age, gender, race (white vs. non-white), SF12 physical component score, and SF12 mental component score.

All regression models were tested for heteroskedasticity using White's test, and White heteroskedastic-consistent standard errors and covariance were calculated where necessary.

Appendix C

Site visit interview guide—1997/98
Summary version

VISN: _____

Date: _____

Person Interviewed: _____

Interviewer: _____ **Recorder:** _____

Introduction

Introduce self and recorder. We are working on MDRC's three (3) year study of service line implementation in VA's VISNs. Dr. Kizer has requested that this study be conducted to provide feedback to Network directors and their staff on the successes and challenges of VHA's planned reorganization. During today's meeting, we will be collecting base-line data for the study. We will use the information gathered today to characterize your network and how it operates. If we want to quote you directly we will contact you beforehand. We will report back on themes discovered and not in a form where individuals can be identified.

"Who are you?"

Network Director's Background

1. **Briefly tell us about your work history prior to taking this position.**
2. **What special skills and/or experience do you bring to this position?**

Structure and Strategy – "What Changes, and How Do You Fit in?"

VISN Organization, Structure and Reporting

3. **Have there been any significant changes to the strategy outlined in the VISN # Strategic Plan you submitted last year?**
4. **Please briefly describe how your network is organized?**
5. **How has the budget process changed as a result of the newly created VISN structure?**
6. **What key organizational changes have been made, and/or planning to be made, in your VISN?**

Service Line Organization and Implementation

7. **Different networks are doing a variety of things related to service lines. To start with, how do you define service lines?**
8. **Do you have, or are you planning to implement, service lines?**

   ___ Yes → Go to #9 →→

   ___ No → Go to #16 →→

9. **What service lines have become operational and/or are planned?**
   How did you determine which service lines to implement?
10. **How is the service line (planned to be) structured/organized?**

How does the service line (planned to be) work

11. What operational authority and control do service lines have?

Probes → – Who do the service line staff report to?

– Do service line nursing managers report to a senior nurse manager outside the service line, the service line manager, or both?

– What about staff from other disciplines or functions?

– Who is responsible for selecting, placing and evaluating service line personnel?

12. How do service lines conduct planning?

Probes → – Is there a business plan?
___ Yes, May we have a copy?
___ No

– How does the service line planning process fit into the VISN planning scheme?

13. Is there a (planned) budget for the service line?

14. With the development of service lines, how has the process of making major decisions changed from the traditional (old) model?

15. How is the service line measured and evaluated?

→→ Go to Question #18

16. Are there any functions, units, task forces or committees in your network that you refer to as

Check all that apply

___ Centers of Excellence?

___ Strategic business units?

___ Core businesses?

___ Product lines?

___ Patient care lines?

___ Special emphasis programs?

___ Functions, units or persons in your network that have responsibility for:

___ care delivered to a specific type of patient (i.e., cancer/cardiac centers)?

___ Monitoring performance on various DRGs or patient conditions?

___ Marketing specialty areas of a facility or facilities within your network?

___ Other. Please specify _____

17. In your view, what are the differences between what you call X (term used to answer Question #16) and what you understand to be service lines ?

→→ Go back to Question #9

→→ If No to Question #16, then ask↓

Probes → – How has the VISN structure affected the design and delivery of health services?

– How has it affected your ability to integrate and coordinate the management and delivery of clinical services within your network?

– What challenges does this network face in meeting its performance objectives?

→→ Go to Question #18

CHANGE – "WHAT IS THE CHANGE PROCESS?"

Managing the Change Process

18. What is the network's overall strategy for facilitating change, both as part of becoming a network..… and —
if answered "yes" to questions #8 or #16 —facilitating service lines?

19. Who are the major stakeholders that influence decision making in your network?

___ Check all that apply *(For interviewer only)*

___ Headquarters? Probe → How do each impact on the changes?

___ Colleagues?

___ Employees?

___ Academic affiliations?

___ Veterans Service Organizations?

___ Federal and state legislators?

___ Patients and/or their families?

___ Other. Please, specify _____

20. How do funding changes (i.e., as a result of VERA) affect the changes occurring or planned in your network?

Probes → – Has there been or will there be a reduction in force (RIFs)?

– Do staff associate RIFs with implementation of organizational change?

21. Is there a primary driver or focal point (e.g., staff person, committee, etc.) leading, facilitating or coordinating the changes in your VISN?

22. a)In what ways have you been involved in formulating changes in your network?

b)To what extent, and in what ways have facility directors, department heads and employees been involved in formulating changes in your network?

23. What vehicles have been used to communicate your network's organizational changes and processes for change to staff in your network office and network facilities?

24. What responses to the various changes have you received from:

Probes → – managers (service chief and above)?

– physicians?

– other staff?

25. What barriers/special challenges have arisen in the change process?

26. What are the key measures that you watch to monitor the implementation of change within your network?

General Impressions of Change and Change Process

27. What the accomplishments of the organizational change and change process thus far?

28. From your perspective, what positive impacts has the reorganization had on:

Probes → – VA patients?

– VA employees?

– VA managers?

– VA overall?

– Others?

29. From your perspective, what negative impacts has the reorganization had on:

Probes → – VA patients?

– VA employees?

– VA managers?

– VA overall?

– Others?

30. What lessons have you learned in this process that you would like to share with other networks?

31. Is there anything that we haven't talked about that you think we should know about the VISN or the changes that are occurring?

Appendix D

Facility Director FAX Survey
Section 1 – Identification of Service Lines

The Under Secretary for Health has directed the Management Decision and Research Center (MDRC) and the Houston Center for Quality of Care and Utilization Studies to evaluate VHA's major organizational changes. The research team is attempting to identify a wide range of interdisciplinary organizational arrangements (IOAs) that:

– link staff together to produce clinical outputs for a homogeneous set of patients and

– have an assigned manager or management team.

Examples range from narrowly focused efforts such as cardiac care or SCI to much more broadly defined areas such as Extended Care or Primary Care. This contrasts with traditional facility organizational forms in which staff is grouped into departments and services by discipline (e.g., nurses, social workers); where management is focused on the inputs to the care process that each service provides; and where no management structure is responsible for the integration of services, planning, resource allocation or utilization based upon the organization's outputs.

Please provide the information requested in this survey. You may complete the survey yourself or delegate its completion to another individual (Staff Assistant to the Director, AA/Chief of Staff, Health Systems Specialist, etc.) who has more detailed knowledge about this subject.

(Please fill in the following table for your facility or health care system. Then proceed to the next page).

Clinical Area (e.g., Mental Health)	**How do you refer to this IOA (e.g., care line, service line, clinical care center)?**

Appendix D
Facility Director FAX Survey
Section 3 – Primary Care Service Lines
(Selected Items)

Primary Care Interdisciplinary Organizational Arrangement (PCIOA)

We define primary care as the provision of continuous, comprehensive and coordinated care to populations undifferentiated by gender, disease, or organ system. It is more than the provision of services in a physician's office. While many health care providers deliver services that are considered primary care, providing one or more specific primary care services does not necessarily constitute a primary care provider.

Textbook descriptions of primary care list four key features that enhance the effectiveness and efficiency of services and differentiate it from other levels of health care services. These are:

– accessible first-contact care;

– continuity over time;

– comprehensiveness; and

– coordination.

Therefore, our definition of a primary care interdisciplinary organizational arrangement (PCIOA) is a management structure focused on producing primary care services. Under this type of management arrangement, all patients have a designated provider, or team of providers, who coordinate ongoing care, including decisions for hospitalization.

12. Does your facility or health care system have any IOAs that include as a part, or are wholly focused on, primary care?

❑ YES ❑ NO

(If YES proceed to the next question.↓ If NO, you have completed this survey. Thank you for your time and effort. Please fax the entire survey to Maria Fonseca, 617-232-6140.)

The following questions are designed to give us a sense of how primary care services are organized at your facility or health care system.

14. Is there a manager responsible for the primary care interdisciplinary organizational arrangement (PCIOA)?

❑ YES ❑ NO

16b. What is the discipline/specialty of the manager?

❑ primary care physician ❑ social worker

❑ specialty care physician ❑ nurse

❑ other (please specify)_____

17. Please indicate the date when the original PCIOA manager was appointed.

Month _____ ***Year*** _____

18a. Is a team (i.e., dyad, triad, or quadrad) or committee responsible for management of the PCIOA?

❑ YES ❑ NO

(If YES, please answer question 18b.↓ If NO, please proceed to question 20. →)

18b. Please list all disciplines that are represented.

_____

_____

19. Please indicate the date when the team or committee first convened.

Month _____ ***Year*** _____

Performance evaluations have traditionally been done by discipline-based services. With the formation of IOAs, manager(s) with varying degrees of input from a facility-wide, discipline-based service chief, service "leader", or professional oversight board sometimes do personnel evaluations. For our purposes, we call these discipline-based entities "Services."

20a. Please indicate which of the following best describes how performance evaluations are done for **physicians** in the PCIOA.

❑ Medical Service has **sole** responsibility for physicians' performance evaluations.

❑ Evaluations are done by Medical Service with input from the PCIOA manager(s).

❑ Responsibility for evaluations is shared equally by Medical Service and the PCIOA manager(s).

❑ Evaluations are done by the PCIOA manager(s) with input from Medical Service.

❑ The PCIOA manager(s) have **sole** responsibility for physicians' performance evaluations.

20b. Please indicate which of the following best describes how performance evaluations are done for **social workers** in the PCIOA.

❑ Social Work Service has **sole** responsibility for social workers' performance evaluations.

❑ Evaluations are done by Social Work Service with input from the PCIOA manager(s).

❑ Responsibility for evaluations is shared equally by Social Work Service and the PCIOA manager(s).

❑ Evaluations are done by the PCIOA manager(s) with input from Social Work Service.

❑ The PCIOA manager(s) have **sole** responsibility for social workers' performance evaluations.

20c. Please indicate which of the following best describes how performance evaluations are done for **the most senior nurse** in the PCIOA.

- ❑ The Nurse Executive has **sole** responsibility for the nurse's performance evaluations.
- ❑ Evaluations are done by the Nurse Executive with input from the PCIOA manager(s).
- ❑ Responsibility for evaluations is shared equally by the Nurse Executive and the PCIOA manager(s).
- ❑ Evaluations are done by the PCIOA manager(s) with input from the Nurse Executive.
- ❑ The PCIOA manager(s) have **sole** responsibility for the nurse's performance evaluations.

20d. Please indicate which of the following best describes how performance evaluations are done for **medical administration personnel** in the PCIOA.

- ❑ Medical Administration Service has **sole** responsibility for medical administration personnel performance evaluations.
- ❑ Evaluations are done by Medical Administration Service with input from the PCIOA manager(s).
- ❑ Responsibility for evaluations is shared equally by Medical Administration Service and the PCIOA manager(s).
- ❑ Evaluations are done by the PCIOA manager(s) with input from Medical Administration Service.
- ❑ The PCIOA manager(s) have **sole** responsibility for performance evaluations of medical administration personnel.

23. If there is a PCIOA personnel budget, who controls it?

(Please check the most appropriate answer.)

- ❑ The service chief retains control over the personnel budget.
- ❑ The service chief and the PCIOA manager share joint control over the personnel budget.
- ❑ The PCIOA manager controls the personnel budget.
- ❑ Facility senior management controls the personnel budget.

Appendix E

Decision Rules for Coding Continuum Scores

Below is a table that facilitates transposing evaluation scores for disciplines to scores on the Charns and Tewksbury continuum, which we call "CaT scores."

Composite Evaluation scores			Discipline. alone		Discipline with Input from SL mgr.		Joint	SL mgr. with Discipline Input	SL mgr. alone
	0		1		2		3	4	5
	1	2	3	4	5	6	7	8	9
Charns Continuum (CaT score)			Integrator	Task force	Reorganize Department	Team	Matrix	Modified Service Line Division	Service Line Division

1) If there is no primary care service line, the CaT score is 1.

2) When evaluation scores for all disciplines match, that composite evaluation score is mapped into the CaT score as per the table.

3) The score for MAS is dropped for the remaining sites. When evaluation scores for the remaining disciplines (except MAS) match, the composite evaluation score is that value, which is mapped onto the CaT score as per the table.

   For the remaining sites, the discipline of the SL manager is also excluded. (E.g. if the manager is a physician, the evaluation score for physicians is not included in the determination). If there is a dyad, disciplines of both dyad members are excluded. Apply the following decision rules to the remaining sites.

4) If the evaluation scores for the remaining disciplines match, or only one evaluation score remains, the composite evaluation score is that value.

5) When evaluation scores of the disciplines differ by no more than one, the composite score for all SLs with three scores will be the score that appears most often. (Example 4,5,5 = 5 while 2,2,3 = 2.)

6) Additionally, when SLs have only two evaluation scores, or in cases where there are four evaluation scores (two of each, e.g. 4,4,5,5), and the manager is NOT a physician or a nurse, the composite score will be determined by the lower of the remaining scores.

7) If range of scores is more than 1, the classification is mixed. Except, if the site has a team of at least 3 members including BOTH a physician and a nurse, the composite score for service line = 6.

Appendix F

Patient Satisfaction Survey

Sampling and Distribution

Patient satisfaction data were obtained from the 1997 and 1998 administrations of the annual survey of veterans conducted by the VA National Customer Feedback Center (NCFC). The NCFC ambulatory care satisfaction questionnaire is a paper-and-pencil self-report instrument designed for mail administration and is an adaptation of an instrument developed by researchers at the Picker Institute (Cleary et al., 1991) and widely used in the private sector. The questionnaire consists of 70 multiple-choice items plus an open-ended comment solicitation. These items represent 10 dimensions of ambulatory care: access, emotional support, [attention to patient] preferences, information/education, continuity of care, visit coordination, overall coordination, courtesy, specialist care, and pharmacy. The patient satisfaction analysis could only be performed for primary care service lines because the patients surveyed had not necessarily made any use of mental health services

To be eligible for the survey, a veteran must have had at least one primary care outpatient visit during a two-month target period — in the 1998 instance, between May 18 and July 17, 1998. Based on a statistical power analysis and anticipated response rates, a target of 175 such patients was sought at each ambulatory care site. At those sites where more than 175 veterans met the inclusion criteria, a sample of 175 was randomly selected. At those sites where fewer than 175 veterans met the inclusion criteria, all eligible outpatients were included in the sample. Sampling was accomplished using the VA's central database of computerized outpatient records. For the 1998 survey, this procedure yielded at total sample of 65,141 veterans who had received care at 391 different ambulatory care sites. The 1997 survey was administered in a similar fashion.

The NCFC employed a modified version of the methodology developed by Dillman (1978) for the administration of mail surveys. Veterans selected for the survey received a pre-survey notification letter explaining the nature and goals of the upcoming survey and encouraging their participation. One week later the first questionnaire was mailed to everyone in the sample. One week after that, a thank you/reminder post card was sent, again to the entire sample. Two weeks later a second copy of the questionnaire was mailed, but only to those who had not yet responded. Data collection remained open for two weeks after the second questionnaire was mailed. For the 1998 ambulatory care survey, the data collection was conducted during August and September.

Of the 65,141 veterans in the initial mail-out sample, 2 percent (n=1450) never received a questionnaire. This "unable to contact" group consisted of: (a) 143 cases eliminated prior to the first mailing due to incomplete or incorrect address information; (b) 1245 surveys that were mailed but returned by the postal service as undeliverable; and (c) 62 instances in which the questionnaire was returned by a surviving relative or friend with a message indicating that the intended recipient was deceased. Of the 63,691veterans who were contacted, 70.4 percent (n=44,821) responded. Questionnaires returned blank were counted as non-respondents.

Scale Construction

Summary scale scores were constructed by the NCFC for each dimension by first dichotomizing responses to the relevant items into "problem" and "no problem" categories. For example, an item from the Preferences scale asks: "Were you involved in decisions about your care as much as you wanted?" Most questions feature response options representing three levels of agreement – for example: yes definitely, yes somewhat and no. In the current example, a response other than "yes definitely" would be coded as a reported problem. A scale score was then computed as the proportion of problem responses. If, for example, a patient reported problems on three of five items in a scale, the scale score would be .60. For each hospital a change score on each of the ten dimensions was calculated by subtracting the 1997 score from the 1998 score.

Appendix G
Primary Care Service Line Regression Results: Standardized Coefficients

	Primary care enrollment	Acute bed day rate	Proportion users w/ 1 or more hospitalizations	Discharge rate	Multi-stay rate	ACSC hospitalization rate	Specialty visit Rate	Urgent care visits/total visits	Urgent care visits/users
97-level variable	-0.57364***	-0.83323***	-0.6608***	-0.69029***	-0.35033***	-0.66399***	-0.41381***	-0.74135***	-1.00132***
size (ftes)	-0.07037	0.167988	0.289788*	0.255529	0.12667	0.154797	-0.17444	-0.04195	0.003848
teaching status	-0.38489	-0.14995	0.09754	0.115422	0.119156	0.418007	-0.13522	0.177279	-0.01335
gm&s	-0.48396	-0.15831	-0.22951	-0.36505	-0.82821	-0.07312	0.135675	0.071356	-0.05283
psychiatric	-0.14357	-0.1813	-0.20293	-0.26109	-0.34401	-0.09361	-0.22152	-0.08698	0.001154
long-term care	-0.46736	0.079837	0.097155	0.054923	-0.22121	-0.08043	-0.06936	-0.33278	-0.05763
west region	0.225782	-0.3688	0.465389	0.457863	0.147096	0.95401**	0.008972	-0.00127	-0.00195
midwest region	0.309332	-0.18998	0.266691	0.150481	-0.47637	0.675271**	0.540513	-0.41865	-0.01904
south region	0.800636	0.019482	0.425547	0.434545	0.291625	0.937776**	0.508272	-0.24068	-0.02303
VERA winner	0.237525	0.181975	-0.09834	-0.13433	-0.17567	-0.20523	0.110029	-0.31819	-0.01751
VERA loser	0.514337	0.294402	0.176553	0.2282	0.159848	0.411708	-0.17053	-0.16573	-0.01329
average age	0.088511	-0.26517*	-0.18991	-0.08514	0.19703	0.13162	0.001281	-0.08629	-0.01188
percent male	0.178739	0.053709	0.188574	0.13416	-0.04754	0.109472	-0.18123	0.06788	0.00096
percent married	0.019717	0.020778	0.149848	0.078961	-0.2224	0.02233	-0.33085	-0.01572	0.018888
percent white	0.020011	0.102994	0.190134*	0.185249*	0.187684	0.279995	0.126078	0.091063	0.00153
ipcs	0.107532	0.159056	0.089343	0.06634	0.018385	-0.02749	0.163218	-0.15617	0.01324
imcs	0.005747	-0.07646	-0.09426	-0.0373	0.222706*	-0.03833	-0.06773	-0.0476	0.003945
young task force	0.001754	0.433907	0.714814* (p=0.501)	0.749893*	0.748844	0.783191* (p=0.510)	-0.50672	0.401457	0.032104
young team	-0.04753	0.299309	0.223665	0.370213	0.707622	0.241909	-0.43143	0.978962*	0.030845
young division	0.036827	-0.19799	0.293789	0.290047	0.156946	0.587263*	-0.57482	0.53764*	0.031007
young mixed	0.255245	0.00215	0.247716	0.312565	0.472603	0.695309**	0.19912	0.343952	0.043287
old task force	-0.0389	-0.07875	0.316205	0.274717	-0.05823	0.572243	0.154097	0.533064	0.030639
old team	0.581176*	-0.02494	0.035107	0.00154	-0.07561	0.048173	0.124525	0.454853	0.034199
old division	0.133084	0.051534	0.264871	0.214702	0.036482	0.253354	0.343197	0.396828	0.026129
old mixed	0.15705	0.216691	0.211348	0.131312	-0.33439	0.28786	0.550086*	-0.33534	0.0279
team lead	-0.19639	-0.09198	-0.07149	-0.08667	-0.13333	-0.10244	-0.4665	-0.1652	-0.0092
budget control	0.152378	-0.00274	0.120264	0.056756	-0.14258	0.000962	0.772964***	-0.14048	-0.00923
F-statistic	1.78431*	10.22523***	3.78166***	4.610225***	2.014837**	4.624506***	3.086427***	6.061345***	2.054106**
Adjusted R^2	0.300771	0.711401	0.476892	0.526379	0.326926	0.52725	0.426622	0.593697	0.331187

Table entries standardized regression coefficients. *p<.05 **p<.01 ***p<.001

Appendix G
Mental Health Service Line Regression Results: Standardized Coefficients

	Psychiatric bed day rate	Total acute bed day rate	Proportion of hospitalizations with no prior PC visit w/in 30 days	Readmission rates	Proportion of hospitalizations followed by PC visit w/in 30 days	Urgent care visit rate
97 level variable	-0.72937***	-0.6806***	-0.63064***	-0.46184**	-0.51187***	-0.47006
size (ftes)	0.101231	0.087135	0.17066	-0.10136	-0.13373	-0.09401
teaching status	-0.07015	0.019744	-0.203	0.03397	0.143011	0.13743
gm&s	0.097888	0.112372	0.586584	0.084161	-0.53183	0.739905
psychiatric	0.124636	0.021516	0.289652	0.091577	0.108592	0.050352
long term care	-0.04575	-0.10087	0.170789	0.732129**	-0.03489	0.068406
VERA winner	0.07536	0.078049	-0.14354	0.085203	0.601238*	-0.08505
VERA loser	-0.15887	-0.17491	0.207819	0.219266	-0.28726	0.07153
midwest region	-0.62496*	-0.45845	-0.27824	-0.1111	-0.47745	-0.14674
south region	-0.37097	-0.08812	-0.26541	-0.22177	-0.50682	0.17935
west region	-0.74317*	-0.62392	-0.10142	0.027415	-0.70752	0.039428
average age	-0.05845	-0.00454	-0.12059	0.06871	-0.00346	-0.08729
percent male	0.021123	-0.0162	0.125717	-0.13108	-0.05334	0.011769
percent white	0.010798	0.07404	-0.08957	-0.1137	0.062975	0.218599
percent married	-0.00934	-0.00616	-0.10114	0.096854	-0.01703	-0.23311
Ipcs	-0.03242	0.077144	-0.36735***	0.183392	-0.17265	-0.02381
Imcs	0.061411	-0.00301	0.071712	-0.09258	0.098584	0.070528
young task force	1.166047*	1.072655*	-1.36339*	-0.09524	-0.9305	0.73178
young team	0.110118	0.030985	0.046257	-0.31532	-0.15583	0.520722
young division	0.242325	0.209734	-0.14205	0.088934	-0.16896	0.552059*
young mixed	-0.00032	-0.13108	0.019731	0.348824	-0.09034	0.243061
old task force	-0.06475	-0.09852	0.238066	0.071502	0.31789	0.195605
old team	-0.13133	-0.21031	0.0773	-0.36454	0.105528	-0.18897
old division	-0.06647	-0.15152	-0.3978	-0.17627	0.155994	0.260317
old mixed	0.090462	-0.12544	0.284846	0.983879**	0.537033*	0.511818
team lead	0.083919	0.098499	0.207934	0.377221	-0.22538	-0.00163
budget control	-0.26662	-0.24349	-0.20974	-0.33978	0.052875	-0.33284
F-statistic	5.865623***	5.000659***	5.354632***	1.867486*	2.759192***	2.014447**
Adjusted R^2	0.585756	0.546591	0.563481	0.310439	.399458	0.326883

Table entries standardized regression coefficients. *p<.05 **p<.01 ***p<.001

Appendix G
Primary Care Regression Results: Standardized Coefficients

	Access	Emotional Support	Patient Preferences	Patient Education	Visit Coordination	Overall Coordination	Continuity of Care	Courtesy
97 level variable	-.93***	.53**	-.78***	-.78***	-.81***	-.84***	-.56***	-.96***
size (ftes)	.16	.07	.00	.05	.00	-.09	-.05	.07
teaching status	-.07	-.45*	-.14	-.12	-.07	.11	-.12	-.35
gm&s	.01	-.06	.02	-.01	.08	.08	.42	.23
psychiatric	-.11	-.32	-.11	-.10	-.09	-.08	.10	-.05
long term care	.08	.18	.01	.02	.01	.06	.10	.16
VERA winner	-.11	-.37*	-.11	-.15	-.11	-.15*	-.11	-.11
VERA loser	-.06	-.76*	-.13	-.15	-.14	-.11	.28	.01
midwest region	-.10	-.15	-.05	.07	-.14	.04	.24	-.21
south region	-.22	-.58	-.15	-.02	-.21	-.09	.03	-.36
west region	.01	-.85*	-.09	.08	-.03	.11	.20	-.14
average age	-.02	-.00	-.05	-.04	-.11	.00	.03	-.14
percent male	.13	.18	.14	.17*	.10	-.04	-.08	.12
percent white	-.54***	-.07	-.21*	-.11	-.17	-.12	-.13	-.42***
percent married	.18	.07	-.01	.02	-.07	-.08	-.04	.10
ipcs	-.15	-.07	-.26**	-.12	-.20*	-.17*	-.11	-.17
imcs -.40***	-.11	-.12	-.14	-.10	-.27***	.09	-.22**	
young task force	.05	.91*	.05	.02	.05	-.01	-.82	.66
young team	.05	.22	-.02	.02	-.02	.13*	-.02	-.48
young division	-.05	-.40	-.19*	-.10	-.05	.05	-.03	-.35
young mixed	.06	-.45	.03	.02	-.01	.01	.17	.40
old task force	-.05	-.47	-.11	-.04	-.11	-.01	1.24**	-.60
old team	-.06	-.08	-.08	-.08	-.06	-.02	-.08	-.47**
old division	-.05	-.55	-.19**	-.11	-.09	-.03	-.15	-.54*
old mixed	.19**	1.03***	.20	.13*	.22***	.18***	.30	.35
team lead	.09	-.08	.06	.08	.10	.00	.39 .21	
budget control	-.04	.07	.10	-.03	.01	-.07	-.29	.36
F-statistic	6.26***	4.41***	6.82***	7.71***	7.09***	12.17***	3.46***	8.62***
Adjusted R^2	.60	.52	.62	.65	.63	.75	.45	.68

Table entries standardized regression coefficients. *p<.05 **p<.01 ***p<.001