Plan for an Evaluation of the CHAMPUS Reform Initiative

Susan D. Hosek, Mary Anderson, Alan Hartford, George Olson, James Press, Elizabeth Sloss

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Prepared for
The Office of the Assistant Secretary of Defense/Health Affairs
PREFACE

This Note describes an evaluation plan for the CHAMPUS (Civilian Health and Medical Program of the Uniformed Services) Reform Initiative demonstration project, to be conducted beginning in April 1988. The evaluation plan was requested by the U.S. Congress; it is being supported by the Office of the Assistant Secretary of Defense, Health Affairs. The study reported on here has been carried out under the auspices of the National Defense Research Institute, RAND's OSD-sponsored Federally Funded Research and Development Center.
SUMMARY

The dependents of active-duty personnel and members of military retirees' families receive health care from Military Treatment Facilities (MTFs) and from civilian providers under the Civilian Health and Medical Program of the Uniformed Services, known as CHAMPUS. CHAMPUS resembles a traditional health insurance plan, covering a wide range of services subject to beneficiary cost-sharing and the nonavailability of nearby military inpatient care. Like other health insurance programs, CHAMPUS has experienced rapidly increasing costs. In addition, beneficiaries responding to surveys have expressed dissatisfaction with aspects of both CHAMPUS and the MTFs, including access to care, continuity of care, and CHAMPUS benefits and paperwork.

To correct these problems, the Assistant Secretary of Defense for Health Affairs has developed the CHAMPUS Reform Initiative (CRI) and, at the request of Congress, will conduct a demonstration of the reforms before implementing them nationwide. This Note describes a plan for evaluating this demonstration. The evaluation will describe the methods followed by each contractor in implementing CRI, identify problems uncovered by the demonstration, estimate the effectiveness of CRI in achieving its goals, and recommend changes in the program to enhance its effectiveness.

A central feature of CRI is the contracting out of CHAMPUS services under a fixed-price contract that covers all CHAMPUS services in a designated area. Other major features of this complex reform initiative include an enrollment option (CHAMPUS Prime) in which the beneficiary agrees to use a panel of "preferred" providers in return for increased primary care coverage and decreased cost-sharing and paperwork and programs designed to increase use of MTFs and improve the beneficiaries' access to care and continuity of care in both systems. The demonstration contracts have not yet been awarded, but it is expected that three contracts will be awarded, one each for Florida-Georgia and California-Hawaii and the third for the New Orleans metropolitan area.
To separate the effects of CRI from other changes, the evaluation will compare the experiences at baseline and during the demonstration period in the demonstration areas with a matched set of control areas. It will determine which factors affect beneficiary enrollment in CHAMPUS Prime and will estimate the changes resulting from CRI in access to care, use of services in the MTFs and under CHAMPUS, continuity and quality of care, beneficiary satisfaction, and capacity utilization and case mix in the MTFs.

Since CRI is a complex program, its full effects will take some time to become apparent. In conducting this evaluation and recommending changes, we will be sensitive to the gradual nature of change and will recognize where the process is not complete. We will also consider whether the trends we observe in outcomes are consistent with longer-run goals, including cost containment.
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I. INTRODUCTION

This Note describes a plan for an evaluation of a significant revision in the CHAMPUS program. CHAMPUS (Civilian Health and Medical Program of the Uniformed Services) was enacted by Congress in 1956 to supplement care available in Military Treatment Facilities (MTFs) for nonactive-duty beneficiaries. The major beneficiary groups covered by CHAMPUS are active-duty dependents and retirees and their dependents. CHAMPUS closely resembles a traditional health insurance plan in that it reimburses for civilian health services on the basis of billed charges, subject to beneficiary cost-sharing and the nonavailability of inpatient care in appropriately located military hospitals.

The Military Health Services System (MHSS), consisting of the MTFs and CHAMPUS, has faced several problems in recent years. CHAMPUS costs have risen rapidly.\(^1\) Despite the increasing costs, beneficiaries are dissatisfied with CHAMPUS because of coverage limitations, out-of-pocket costs, and program complexity. Finally, the Department of Defense (DoD) believes that poor coordination between CHAMPUS and the direct care system of MTFs has led to inefficient delivery of services and inadequate continuity of care for beneficiaries using both systems.

THE CHAMPUS REFORM INITIATIVE

In response to these problems, the Assistant Secretary of Defense for Health Affairs developed the CHAMPUS Reform Initiative (CRI) and will conduct a demonstration project beginning in April 1988. The planned program changes are complex, but the basic features include:

1. Selection of several contractors, each responsible for the financing and delivery of CHAMPUS services in an entire area;

\(^1\)In testimony before the Subcommittee on Military Personnel of the House Armed Services Committee on March 12, 1987, Robert Hale of the Congressional Budget Office reported a 26.5 percent increase from fiscal years 1985 to 1986. Cost increases for the MHSS as a whole have been less dramatic, but these costs also include nonpatient care.
2. A price fixed prospectively for all covered services delivered to CHAMPUS beneficiaries residing in the area;
3. An alternative to current CHAMPUS, called CHAMPUS Prime, that would offer improved coverage of primary care, reduced cost sharing, and simpler procedures to those beneficiaries who enroll in the plan and use a panel of "preferred" civilian providers selected by the contractor;
4. A "Healthcare Finder" to help beneficiaries obtain appointments in the military facilities, referrals to appropriate civilian providers, and medical record transfers;
5. "Resource sharing" agreements between each civilian contractor and military hospital in his area in which the contractor agrees to provide manpower and other resources needed to increase capacity utilization within these hospitals; and
6. Quality assurance and utilization review programs to ensure the provision of high quality and cost effective care.

As stated in the requests for proposals for the CRI contracts, the objectives of these changes are to:

1. Improve coordination between the military and civilian components of the MHSS;
2. Enhance services for beneficiaries; and
3. Contain costs, both for the government and for the beneficiaries.

CRI will fundamentally change CHAMPUS. Given the complexity of the proposed reform, Congress has mandated that a demonstration project be conducted before full implementation and that a comprehensive evaluation of the demonstration be undertaken. The contracts for the demonstration have not been awarded yet, but three contracts will probably be awarded: one for Florida and Georgia, a second for

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2This Congressional action was based on recommendations by the U.S. General Accounting Office (1987) and on the testimony of Robert Hale of the Congressional Budget Office.
California and Hawaii, and a third for New Orleans. The results of the evaluation, the plan for which we describe here, will be used to assess the overall effectiveness of the CRI and to modify its design to correct any problems that the demonstration has uncovered.

STRUCTURE OF THE EVALUATION

The evaluation will describe the methods used by the contractors to start up the demonstration and will evaluate the changes resulting from the introduction of CRI in the demonstration areas. During the start-up phase, we will describe the specific programs developed by each contractor, highlighting important differences among them, and any problems they may encounter in developing and fielding these programs. Then we will analyze the demonstration experience to measure the changes brought about by CRI in a number of areas, including beneficiary access and continuity of care, use of services and costs, and the mix of services provided in military medical facilities and those under CHAMPUS.

Since CRI represents a major reform of the CHAMPUS program, we anticipate that the full effects will not be observed for several years. In conducting the evaluation, we will estimate outcomes as accurately as possible and will recognize in our recommendations the possibility of additional responses to CRI by providers and beneficiaries.

Section II describes our plans for assessing the contractors' efforts to plan and implement CRI in each demonstration area. In Sec. III, we describe the major outcomes to be analyzed in estimating CRI's effects and the approach our analysis will use for each outcome. Section IV describes the data that will be available in MHSS data systems and from the contractors, and it identifies the data that we will collect as part of the evaluation.
II. START-UP OF THE CRI DEMONSTRATION

Upon the awarding of the demonstration contracts, we will initiate a descriptive analysis of the implementation phase. Using case study techniques, we will describe the implementation process used by each contractor. This analysis will provide OSD/HA with early information on: (1) the methods used in implementing the contractors' programs, (2) the actual implementation schedules followed, and (3) problems encountered and the solutions to these problems. The case studies will also provide the evaluation with detailed information on the CRI program in each area (and other related activities) that can be used to design outcome analyses and interpret results.

In this initial evaluation phase, we will review:

* Major features of CHAMPUS Prime: additional coverages, cost-sharing for preferred and nonpreferred providers, and the preferred provider panels;
* CHAMPUS Prime enrollment procedures, including marketing and beneficiary information approaches;
* Resource sharing negotiations and agreements;
* Healthcare Finder operations; and
* Quality assurance and utilization review procedures.

CHAMPUS PRIME

The requests for proposals issued by OSD/HA did not specify all the details of a CHAMPUS Prime program. In addition, it allowed contractors to develop additional enrollment options, including a prepaid managed-care plan. We will summarize the important features of each enrollment plan offered in each area and obtain from the contractors their reasons for selecting these features. Our description will focus on how these plans differ from the traditional CHAMPUS plan and what the beneficiaries can gain in return for enrolling in CHAMPUS Prime or another option and thereby limiting their freedom of choice of providers.
A key element in CHAMPUS Prime is the preferred provider panel, to be established in as much of the demonstration area as possible 60 days before the initiation of services to enrollees. In some areas, the contractor may already have a provider panel in place. We will review the establishment and composition of each panel, including the criteria used in choosing the providers and the number of providers included from each specialty, and we will compare the providers' locations with centers of beneficiary populations. If we can obtain appropriate data, we will compare the professional characteristics of panel providers and nonpanel providers in the same area. For areas in which the contractor must organize a panel specifically for CHAMPUS Prime, we will be able to observe the process more closely and determine the feasibility of forming networks in a brief time period, but our observations will focus on the same issues.

We will obtain information on the provider panels from several sources. The contractors will be required to submit reports 45 days before initiation of services, listing the providers, the start dates, and the completeness of the negotiated agreements. We will also review the general terms of the provider contracts. This information will be augmented by interviews with relevant contractors and representatives of the provider communities. Finally, we will explore the availability and suitability of data collected by the American Medical Association and the American Hospital Association on the preferred providers and other providers in the same geographic areas.

ENROLLMENT IN CHAMPUS PRIME

The early success of CRI will depend crucially on the contractors' abilities to inform beneficiaries and attract enrollees during the first enrollment period. Beneficiary enrollment in CHAMPUS Prime and use of the Healthcare Finder will be analyzed more fully in the final phase of the evaluation, but we will obtain as much information as possible on both during this earlier phase.

We will review the contractors' methods for disseminating information on CHAMPUS Prime and any other enrollment options, including: restrictions on beneficiaries' freedom of choice of
provider, enhanced benefits, and enrollment and disenrollment procedures. We will then observe the enrollment process and note any problems encountered with the contractors' systems or use of the Defense Enrollment Eligibility Reporting System (DEERS) as an enrollment tracking system.

From DEERS, we can determine the proportion of beneficiaries who elect to enroll in each area. We plan to augment these data by surveying a sample of beneficiaries about their familiarity with CHAMPUS Prime and their reasons for enrolling or not enrolling. We will also obtain other information on these beneficiaries for use in detailed analysis of enrollment (described in the next section).

RESOURCE SHARING

The contractors will be required to seek agreements with each MTF in their areas before the contractors' start of operations. These agreements will describe any medical personnel, equipment, or supplies that will be provided by the contractor to the MTF, along with any conditions attached to the use of these resources. These agreements are intended to serve two purposes: (1) to enhance the MTF's ability to provide inpatient and outpatient services that would otherwise be provided at greater expense to the contractor and (2) to effect a change in the MTF case mix away from primary care and toward specialty care. Over time, by facilitating efficient shifts of care to the MTFs, resource sharing is designed to contain overall MHSS costs. At the same time, the contractors will benefit most if more specialized and costly care can be provided by the MTFs, thus providing incentives to redirect the MTFs' case mixes toward services more consistent with wartime requirements.

We will document whether resource sharing agreements can be negotiated before the demonstration begins and summarize the contents of these agreements. Through interviews of contractor and MTF personnel, we will also obtain information on any problems encountered during the negotiations and the criteria used to determine what resources would be requested by the MTFs and provided by the contractors. Finally, we will describe the contractors' methods for acquiring the resources and assuring that they conform to government requirements.
HEALTHCARE FINDER

The Healthcare Finder concept was developed to improve CHAMPUS beneficiaries' access to health care and continuity of care. In addition, by referring beneficiaries to the MTFs when space is available, the Healthcare Finder provides the mechanism by which resource sharing is translated into changed patterns of care.

In implementing the Healthcare Finder concept, the contractors will install personnel in each MTF who can provide various services to beneficiaries, including making appointments in military facilities, obtaining referrals to civilian providers, and facilitating the transfer of records between the MTFs and civilian providers. In the course of delivering these services, Healthcare Finder personnel will promote the optimal use of the MTFs whenever possible.

In evaluating the Healthcare Finder program, we will focus on three issues: (1) the volume and types of services requested by different beneficiary groups, (2) the methods used to deliver these services, and (3) the patterns of referrals to military and civilian providers for beneficiaries using this service. We expect that some of the information needed can be routinely collected by Healthcare Finder personnel, but we will also obtain measures of beneficiary awareness of the Healthcare Finder Program and use of its various services from a beneficiary survey. A final source of information will be interviews of contractors, including Healthcare Finder staff, and MTF personnel.

QUALITY ASSURANCE AND UTILIZATION REVIEW PROGRAMS

The requests for proposals for CRI required that the contractors develop quality assurance (QA) programs. The QA programs must conform to DoD guidelines. In the next section, we discuss the various approaches used in quality of care assessment. During this stage of the evaluation, our review of the quality of care programs will be limited to a study of their structure and operation.

We will focus on methods used to identify cases needing review, conduct the reviews, and implement findings. The contractors' programs will be compared with the QA programs used by MTFs and other health care organizations.
The contractors will be permitted to develop utilization review (UR) programs and, given that they will bear the risk of increased utilization and costs, we expect that they will conduct UR. As we discuss in more detail in the next section, UR programs attempt to identify and prevent excessive use of services. Thus, in contrast to QA programs, their primary goal is cost containment. During this phase, we will begin an evaluation of the contractors' UR and will report on our preliminary findings. This effort, which will continue into the final phase, is described more fully in the next section.
III. OUTCOMES OF THE CRI DEMONSTRATION

The purpose of the final evaluation phase is to analyze the experience under the CRI demonstration and to determine whether the program is achieving its goals. We will estimate the changes in a number of important areas brought about by CRI and, where possible, project the future course of CRI. If its goals are not met, we will try to explore the reasons CRI fell short and suggest changes in the program.

The major outcomes to be evaluated will be:

- Beneficiary enrollment in CHAMPUS Prime and use of other options;
- Beneficiary use of MTF and CHAMPUS services;
- Beneficiary and government costs;
- MTF and CHAMPUS case mixes;
- Access to care and continuity of care;
- Administrative simplicity for beneficiaries;
- Beneficiary satisfaction;
- Quality of care; and
- Utilization review.

The approaches we will follow in analyzing each of these outcomes are described later in this section.

OVERALL DESIGN OF THE OUTCOME ANALYSES

CRI will be introduced into a health care system that is undergoing other changes as well. For example, in October 1987, CHAMPUS will begin prospectively paying civilian hospitals according to Diagnostic Related Groups (DRGs) similar to the ones used by Medicare. As a result of research to date on the Medicare payment system, we can expect that CHAMPUS DRGs will alter use patterns and costs. We can expect that other changes affecting the MHSS will also occur during the period we observe CRI. To adjust our results for these changes and more
accurately estimate the effects of CRI, we will conduct parallel analyses of data collected in the demonstration areas and similar data collected in matched control areas. The control areas will serve to estimate the effects of the other changes.

Thus, the analysis of CRI outcomes will be designed to resemble a controlled and prebalanced social quasi-experiment. The design is controlled, in that we will designate "control areas" within the states not included in the demonstration and therefore continuing under the traditional CHAMPUS program. The control areas will be selected to match the demonstration areas insofar as certain predesignated balancing variables are concerned. The balancing variables will include:

- Number, size, and Service affiliation of MTFs;
- Descriptors of the CHAMPUS-eligible population (e.g., active-duty dependents, retirees and dependents, age, proportion living in an MTF catchment area);
- MTF and CHAMPUS use rates for this population for outpatient care and inpatient care as well as important services such as obstetric care; and
- Descriptors of the civilian medical market (e.g., physicians and hospital beds per 1000 population, preferred provider organizations and health maintenance organizations).

We will develop a data file for all states and many cities, containing the best available information on these balancing variables. The selection of balanced demonstration and control areas will be based on the MISER criterion\(^1\) for pre-experimental balancing (Press, in press). This approach will maximize the statistical power of the evaluation, i.e., maximize the probability that we will reject the hypothesis that CRI has not changed outcomes when, in fact, it has made a difference. The balancing is intended to match the demonstration and control areas on many important variables, so that observed differences in outcomes will be attributable to differences between CRI and traditional CHAMPUS instead of to differences in balancing variables.

\(^1\)MISER stands for "minimizing the inflation of the standard error" of a contrast.
For each of the outcomes described below, we will analyze baseline data as well as demonstration-period data from both demonstration and control areas. With this structure, we can compare the two sets of areas at baseline and can estimate changes over time in each area.

**BENEFICIARY PARTICIPATION IN CRI**

CHAMPUS Prime, the enrollment option at the core of CRI, is a preferred provider organization (PPO) plan. More specifically, because the plan will not cover services obtained from nonpanel providers except in emergencies, it is an exclusive provider organization (EPO). EPO plans require beneficiaries to use providers who have been selected for their efficient practice patterns or their willingness to offer fee discounts and adhere to the PPOs' utilization review procedures. EPO plans more strictly limit the beneficiaries freedom of (provider) choice than PPOs do; the latter reimburse for nonpreferred provider services but provide better coverage for preferred provider services. PPOs and EPOs were developed as a compromise between traditional indemnity plans, which incorporate complete freedom of choice of providers, and health maintenance organizations (HMOs), which typically have a smaller panel of providers. Unlike HMOs, PPOs and EPOs generally pay providers on a fee-for-service basis.

In addition to CHAMPUS Prime, the contractor may introduce a PPO option (using the same provider panels) into the standard CHAMPUS program and offer other enrollment options, such as an HMO. Thus, CRI permits the contractor to offer the triple-option program (traditional, PPO, HMO) that is becoming increasingly popular in employee group health plans, with the addition of an EPO.

Over the past three years, the number of PPOs has grown sharply, with the major market being employee group health plans. Because PPOs are relatively new, very little is known about their acceptance among beneficiaries and their effectiveness in containing costs. A major RAND study of six large employers' experiences with five different PPOs is under way; preliminary results suggest that up to two-thirds of covered individuals will use preferred providers (Ginsburg et al., 1987). Consistent with these results, CHAMPUS Prime should attract a significant number of enrollees.
Our analysis of CHAMPUS Prime and CRI in general will draw upon the approach we are using in studying PPOs (Ginsburg et al., 1986). The first step will be a descriptive analysis, reporting on the number of beneficiaries enrolling in CHAMPUS Prime and their composition by age, sex, beneficiary category, Service, prior use or nonuse of the MHSS, and when they moved into the area. The descriptive analysis will explore differences among the catchment areas included in the demonstration.

Using the results of the descriptive analysis, we will formulate a model of the beneficiary's decision to enroll or not to enroll in CHAMPUS Prime and we will relate this decision to the beneficiary's characteristics, the value to him of the enhanced benefits offered under CHAMPUS Prime, and the availability of MTF and civilian care in his area. We expect that participation will differ for active-duty dependents and retired beneficiaries for a variety of reasons, one of which is the greater mobility of active-duty families.

This analysis will produce estimates of the number of beneficiaries who have not previously used the MHSS but are attracted to the system by CHAMPUS Prime (and other aspects of CRI). The attraction of a significant number of prior nonusers (frequently called "ghosts") would represent an expansion of CHAMPUS and direct care obligations that could lead to increased costs in the long run. This clearly would be undesirable if the added users had other sources of coverage, but it may be a desirable outcome if they previously had been unable to obtain care. Therefore, it will be important to determine the prior sources of care for new CHAMPUS users.

MTF AND CHAMPUS UTILIZATION AND COSTS

Among the most important questions to be answered by the demonstration are: Has CRI changed the use patterns of beneficiaries, particularly among those choosing CHAMPUS Prime? How much more or less would the government and beneficiaries spend on health care without CRI?

Many factors affect the use and cost of health care services and we observe significant unexplained differences across geographic areas. We can expect that the introduction of CHAMPUS DRGs and other changes unrelated to CRI will influence use and costs. Therefore, instead of
simply measuring the change in use and costs between the pre-CRI and post-CRI periods, we will compare observed use and costs with those we predict for the same population without CRI.

We will also analyze the experiences of different population subgroups to explore what might happen as CRI is extended to other areas. Of particular interest will be comparisons between the beneficiaries who enroll in CHAMPUS Prime and those who do not. All such comparisons must control for systematic differences between the subgroups. For example, CHAMPUS Prime enrollment may be highest among families with young children whose use of health care differs from others regardless of the nature of the health plan.

**Measures of Utilization**

The utilization outcomes of interest are outpatient visits, hospital admissions, and lengths of stay. We will collect as much information as possible at the individual beneficiary level for care rendered in the MTFs and by civilian providers, whether paid for by CHAMPUS or not. Measures of non-MHSS use are important because some beneficiaries may alter the mix of MHSS and other services they use without switching entirely from one source to the other. Some of this information is available from existing sources, but some must be obtained through beneficiary surveys. To the extent possible, we will obtain utilization data according to type of service or specialty area. (Section IV discusses in more detail the data to be used in the evaluation.)

**Measures of Cost**

The analysis will cover both beneficiary and government costs. Beneficiary costs include CHAMPUS deductibles and copayments, MTF inpatient charges, and out-of-pocket costs for care not covered by CHAMPUS. Government costs include the costs of MTF care for nonactive-duty patients and CHAMPUS costs--for the CRI areas, the cost of the contract and, for non-CRI areas, total CHAMPUS reimbursements plus administrative costs. Government costs are available from existing reporting systems, but beneficiary costs will be calculated from CHAMPUS claims records and from information obtained from beneficiary surveys.
CHAMPUS costs under CRI are established by the contract in each area. However, the contract costs may or may not be a good predictor of the longer-run effects of CRI on costs. For example, if the contractors lose money on the contract, costs will inevitably increase in future years unless more effective cost containment programs can be developed. If they make a substantial profit, the government can probably negotiate a more favorable contract price in the future. Thus, the evaluation must consider the cost implications associated with observed utilization rather than the costs specified in the contract.²

EFFICIENCY OF UTILIZATION OF MTF RESOURCES

CRI is designed to increase MTF capacity utilization and lay the basis for changing the case mix in the MTFs. A major purpose of resource sharing is to relieve MTF resource constraints that limit capacity utilization. In addition, by providing better primary care coverage, more continuity of care, and additional MTF resources, DoD intends to redirect a higher proportion of the primary care needed by beneficiaries to the civilian sector and reorient the MTFs toward more specialty care. As outlined by the 1985 Blue Ribbon Panel on Sizing Department of Defense Medical Treatment Facilities, a more complex MTF case mix would enable a shift in the Specialty mix of active-duty medical personnel (especially physicians) to better conform to wartime requirements. Therefore, although the evaluation may cover too short a period of time to observe much change, we will estimate the change in MTF workloads, both in volume and case mix.

An MTF's ability to deliver more services is limited by its capacity, particularly in inpatient care. A small community hospital cannot perform complicated surgical procedures or treat severe medical conditions. Interviews with MTF personnel will indicate which additional services each MTF is capable of adding. These can be contrasted with the additional resources obtained through resource

²To keep the discussion simple, we have ignored the effects of contractual arrangements for retrospective cost adjustments. However, the effects of these arrangements will be incorporated into our analysis.
sharing with the contractors. We will also monitor changes in the military resources at each MTF so that we can measure the total resources available over time in the various specialty areas.

We will evaluate several different measures of MTF capacity utilization. Obvious measures are the number of occupied beds per day and clinic visits by specialty. At the same time, the number of nonavailability statements directing patients to CHAMPUS, when compared with changes in the beneficiary population's use of health care services, will provide a convenient indicator of the inpatient services not being delivered in the MTFs. Finally, DRG weights can be used to measure changes in inpatient case mix under CRI, following an approach used for Medicare. At present, the MTF data systems do not contain the detailed information on diagnosis needed to estimate outpatient case mixes.

If resource sharing is successful in relieving temporary or permanent resource bottlenecks in the MTFs, the MTF providers should become more productive. We will attempt to estimate the effects of CRI on MTF productivity, using the output measures described above.

ACCESS TO CARE

A major goal of CRI is to improve beneficiaries' access to care and the continuity of care that they receive, particularly for those who combine military and civilian care. Beneficiaries have repeatedly identified access and continuity as areas of high dissatisfaction. The most recent example of this is the 1984 Beneficiary Survey, in which over half of the respondents were dissatisfied with their continuity of care and 42 percent were dissatisfied with their access to military care (Albright et al., 1984)

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7In interpreting these data, it is important to recognize that some nonavailability statements are for services that are too specialized for the MTF or that can be provided more efficiently under CHAMPUS.

8In FY 1988, DoD will implement two DRG systems that differ in the relative weights they assign to the diagnostic groups. The first system will be used to reimburse civilian hospitals under CHAMPUS and the other will be used to measure MTF workloads and to allocate medical resources.
Our analysis will draw heavily on the literature on measuring access and continuity. With respect to access, two main types of indices have been identified (Aday and Anderson, 1975; Aday et al., 1984). Process indices are properties of the medical care system and the population served by it that affect entry to the system and consumer satisfaction. Outcome indices are measures reflecting use of and satisfaction with the medical care system. Another way of differentiating the measures is that process indices relate to potential access and outcome indices relate to realized access.

We will analyze several measures of access to (1) estimate the effects of CRI on access to care, (2) identify subgroups within the CRI system for whom access differs, and (3) suggest how the structure and policies of CRI might be altered to eliminate barriers to access.

Process Indices of Access

Process indices may include, but will not be limited to:

- Regular source of care: where one usually goes when sick or in need of advice about health;
- Travel time to care: the time spent traveling to obtain medical care;
- Appointment or walk-in visit: percentage of visits falling into each category;
- Appointment waiting time: length of time before an appointment can be scheduled;
- Office waiting time: length of wait in doctor's office before being seen.

Outcome Indices of Access

The most easily interpretable outcome measures of access are based on simple use statistics. This type of outcome index may include, but will not be limited to:
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* Percentage seeing a physician: percentage of population who see a physician during the study period;
* Mean number of physician visits: includes both initial contacts and return visits to a physician; overall and for those with one or more visits;
* Ratio of hospital outpatient department visits to total physician visits;
* Percentage of adults receiving specific preventive care during the study period: blood pressure check, pap smear (for females), breast examination (for females);
* Percentage of children receiving certain preventive care: tuberculosis skin test, measles immunization, DPT immunization, polio immunization;
* Percentage hospitalized: percentage of population admitted as inpatient to hospital during the study period;
* Mean number of hospital admissions and mean number of hospital days per person hospitalized.

Some may argue against the appropriateness of use as a measure of access without controlling for the population's need for medical services. Because the use of medical care may be largely related to the illness experience of a population, differences in use may indicate differences in health status or in the prevalence of certain medical conditions, rather than differences in access. Need-based measures of access attempt to control for an underlying need for medical care. Several approaches have been developed for this purpose, but they suffer from inadequate information about the appropriateness of the observed utilization or they require detailed data not now available in MHSS systems.

We will obtain information on access from MHSS records and through beneficiary surveys. For example, information on the delay in obtaining MTF appointments may be kept by the MTFs and the Healthcare Finder, and a question about appointments might be included in a beneficiary survey. These two measures are both useful indicators of accessibility; the MTF-based estimate allows conclusions to be drawn about overall entry to
the system, whereas the survey-based estimate provides a possible explanation for the level of consumer satisfaction. Given the lack of detailed outpatient data systems, most of the information on access will come from beneficiary surveys.

Several comparisons are particularly relevant to an analysis of access to medical care under CRI:

- Beneficiaries in the demonstration areas implementing CRI compared with those in the control areas with traditional CHAMPUS only;
- Within the demonstration areas, those who enroll in CHAMPUS Prime compared with those who do not, and those who use the Healthcare Finder compared with nonusers.

Continuity of Care

The lack of continuity of care has been one complaint of beneficiaries in the past and the improvement of primary care is one of the CRI's major goals. Therefore, we will develop appropriate continuity of care measures and estimate the effects of CRI on continuity.

Objective continuity of care measures may be separated into two types: visit-based measures and individual-based measures (Smedby et al., 1986). The former require the tracking of patient data visit by visit. The latter are less specific and require data only at the level of each patient. Because a number of studies have shown that these various measures are highly correlated empirically (Ejlertsson and Berg, 1984; Smedby et al., 1986; Steinwachs, 1979), we will focus on those measures most easily administered.

Of the objective measures noted above, the "K-index" proposed by Ejlertsson and Berg is both the easiest, and in the context of CHAMPUS, the most reliable. It measures a beneficiary's total number of repeat visits to a particular provider relative to the total number of visits to all providers, information that may be attainable directly from patient surveys. In addition, patients' subjective perceptions of their continuity of medical care is a useful standard subscale measure in patient satisfaction questionnaires. Third, providers' perceptions of
the continuity of care they are delivering, coupled with their overall impressions of CHAMPUS/CRI performance, will form an important part of the assessment of the changes in continuity of care brought about by CRI.

The continuity measures will be adjusted for age, sex, and diagnosis, as these factors have been shown to influence continuity of care. Intertemporal as well as cross-sectional controls will correct for systematic variance in continuity of care by region, regardless of the CHAMPUS program in effect.

PATIENT SATISFACTION

Patient satisfaction surveys focus on the personal evaluation of different aspects of patient care, based on "personal standards and preferences that can be applied only by the person involved" (Ware, 1981). The aspects of patient care that most influence patients' attitudes toward providers and services are quality of care, accessibility/convenience, finances, physical environment, and availability.

Quality of care encompasses several dimensions of patient satisfaction. The patient's opinion of the providers' ability—both in the art of "caring" and in terms of technical competence—is a large part of quality of care. It also covers the patient's feelings about the usefulness of the providers and of specific treatments in maintaining and improving health status.

Accessibility/convenience describes the factors affecting the patient's ability to arrange to receive medical care services. The following measures are usually classified as indicators of accessibility/convenience: length of time and level of effort required to obtain an appointment, distance to provider, convenience of location, hours of operation, waiting time, and availability of telephone consultation and home care.

Finances refers to the ability of the patient to arrange for payment of services. Evaluating satisfaction with the finances of medical care services would include questions regarding the actual dollar cost of treatment, the allowable mechanisms for payment, and the completeness of insurance coverage.
Physical environment denotes attitudes toward the setting in which inpatient or outpatient care is received. This aspect of satisfaction is most effectively evaluated for a single clinic or facility. Characteristics of the environment include general pleasantness, comfort, cleanliness, and organization.

Availability evaluates whether there are an adequate number of medical providers and facilities within the vicinity of the patient. This aspect of satisfaction has been evaluated rarely according to published reports.

We will evaluate all five aspects of patient satisfaction. The standardized 43-item Patient Satisfaction Questionnaire (PSQ) described by Ware et al. (1983) will be adapted for use in evaluating specific components of the CRI, including the Healthcare Finder, the PPOs, and the better coverage of primary care offered by CHAMPUS Prime. The reliability and validity of patient satisfaction measures based on the PSQ have been studied extensively (Ware et al., 1983).

QUALITY OF CARE

The relative success of the CRI in achieving the goals set for it will depend on the cost-effectiveness of the program, which in turn will depend on the quality of the product. Quality of care can be defined from several points of view, including the clinician's and the patient's, so quality of care measures include both technical and subjective aspects of care. As described above, the patient satisfaction items to be included in the beneficiary surveys contain subscales that allow for an assessment of patients' subjective perceptions of quality. Therefore, the remainder of this discussion focuses on technical quality of care.

Measurement of technical quality of care may consider one or more of three dimensions: structure, process, and outcome. The most easily measured dimension is structure, which includes QA programs as well as the availability and characteristics of providers. The connection between the structure of care and either the process of care or health outcomes has not been established. Nor is the connection convincing conceptually, since the mere presence of the appropriate resources does not guarantee their proper use.
In this evaluation, we will examine the structural quality of care in the demonstration. A major element of this analysis will be a case study of the contractors' QA procedures, including comparisons with the procedures used by DoD for the MTFs and other organizations, such as well-established HMOs or successful peer review organizations (PROs). Through interviews, we will obtain information on how institution of the DRG system has influenced the development of QA programs in control states, on how the CRI has further influenced their development in both military and civilian settings, and on how providers perceive these developments influencing actual quality of care.

Recognizing the limitations of structural analysis, we also will attempt to directly assess the effects of CRI on quality. In recent years, several approaches have been developed for assessing quality of care. Since the connection between the process and outcome of care is also poorly understood, most attempt to measure outcomes, with the assumption that changes in outcome reflect changes in quality, all other factors held constant. Unfortunately, none of these approaches, each of which required a major effort to develop and implement, is well-suited to this evaluation. Therefore, we are evaluating the feasibility of adapting the more promising approaches. Given the difficulties associated with implementing any meaningful quality of care assessment, a final decision regarding the approach we will use for such assessment must await further study of the feasibility and costs of the various strategies.

Most process measures either are a priori unsatisfactory as quality of care indicators or require extensive data collection. At the crudest level, outcomes may be measured as mortality rates, hospital readmission rates, lengths of stay, and destinations at discharge. Such data are contained in discharge summaries and claims records. More detailed measures focus on disease-specific outcomes, such as laboratory values and recurrent symptoms (e.g. angina following coronary artery bypass surgery). These data may be obtained only by abstracting medical records, because no other source of information provides the level of detail for an accurate assessment.
Rather than trying to measure the quality of medical care delivered for all patients across all conditions, resources can be economized by selecting a few "tracer" conditions as representative of overall quality of care and then analyzing these in greater detail. Ideally, one would want to choose a cross-section of conditions prevalent in the CHAMPUS population. Since the population served by CHAMPUS spans a variety of types (e.g., newborns, children, expectant mothers, retirees under age 65), a number of tracer conditions would be needed to represent the health care services used by this demographically diverse group.

As we discussed in Sec. II, DoD plans to implement an independent peer review program in connection with CHAMPUS DRGs. The reviews will employ some of the standard outcome measures—readmissions and deaths—and evaluate the medical stability of discharged patients. They will also conduct generic screens for poor quality. The purpose of peer review is to identify instances of questionable quality of care, not necessarily to make comparisons across geographical areas and different systems of care. The reviews usually are conducted locally and the extra effort to assure uniform procedures and inter-rater reliability is not taken. Therefore, program evaluations almost always must undertake their own effort. We will evaluate the availability of data on technical quality of care from the peer review program when it is in place, but we will also continue to investigate other approaches.

In particular, two studies have developed quality of care measures that could serve as models for our effort. The Medicaid Competition Demonstration Project is evaluating the quality of care delivered to AFDC (Aid to Families with Dependent Children) mothers and children, using hospital, clinic, and individual physician outpatient medical records. The other study is using disease-specific outcome measures for conditions such as depression and acute myocardial infarction to measure the effect of the Medicare DRG program on quality of care. Both studies have also developed methods for controlling for severity of illness, an important factor, because the CRI demonstration is not an experiment with random assignment of beneficiaries to the new and old programs.
UTILIZATION REVIEW

Utilization review is a quality/cost monitoring mechanism that has become increasingly popular over the last few years in the health care marketplace. The CRI contractors are allowed to review the utilization of physician and hospital services under CHAMPUS and CHAMPUS Prime. Under CRI, unnecessary admissions and excessive expenditures are costly to the contractors, who will have strong incentives to conduct effective UR. We will evaluate each contractor's UR program and compare it with the programs used by the other contractors and well-established outside organizations (such as PROs), which may function as standards against which both CHAMPUS systems may be compared. Our evaluations will focus on program structure and implementation, including mechanisms for enforcing UR decisions. We will also compare the findings from this descriptive analysis with the differences in use that we estimate for the different study areas.

UR programs typically contain several components. Most include pre-admission certification for at least some hospital admissions, designed to identify cases that do not require hospital care, reschedule admissions that would otherwise result in unnecessary days of stay, and establish maximum lengths of stay for approved admissions (barring special circumstances).

Another common UR element, concurrent hospital review, evaluates the continued necessity for hospitalization and the use of hospital services by focusing on the use of ancillary services and discharge planning.

Second surgical opinion programs allow a patient to visit a "second surgeon" for a disinterested opinion on the advisability of surgery for the patient's condition. The most effective programs: (a) mandate a second opinion (rather than giving the patient an option), (b) use closed panels of advisors (rather than allowing the patient to go to any surgeon for a second opinion), and (c) screen for those procedures where second opinions would most obviously be of benefit in reducing unnecessary, costly procedures.
Finally, retrospective reviews examine individual physician and hospital utilization patterns to identify problems among providers' practice styles. However, small sample bias is a major difficulty in this attempt. Also, it is imperative that case mix be controlled for; otherwise, for example, "good" providers, to whom complicated cases are referred, will be identified inappropriately as having inefficient practice styles.
IV. DATA SOURCES

The data requirements for this evaluation are extensive. As much as possible, we will rely on existing data sources, but we will also undertake several data collection efforts to augment the existing data, including surveys of beneficiaries and military physicians. In this section, we summarize the data available to us from existing sources and present a general design for our data collection efforts. These data will cover a base-year period—the twelve months preceding the start-up date for CRI—and a study-year period—at a minimum, the following twelve months.

EXISTING DATA SOURCES

The analyses outlined in the previous sections require data on individual nonactive-duty beneficiaries and on the characteristics of MTFs, their catchment areas, and the regions in which they are located. Many of these data are available from existing sources. All of the systems discussed here, except for those listed under "other sources", are maintained by the Department of Defense.

Individual-Specific Data

The Defense Enrollment Eligibility Reporting System (DEERS) is a system maintained to verify beneficiary eligibility for military health service benefits. It contains information on virtually all nonactive-duty beneficiaries and active-duty sponsors, including: beneficiary category, sex, birth date, and the active-duty sponsor's Service, rank, and assignment. DEERS will be our primary source of mailing addresses for beneficiary surveys. However, because of the high mobility of active-duty families in particular, we will develop other methods of reaching active-duty dependents in our samples.

CHAMPUS claims files will provide utilization and cost data for individuals using the traditional CHAMPUS program in the demonstration and control states for the base year and demonstration year. Similar data will be collected by the CRI contractors for individuals enrolled
in CHAMPUS Prime. These data can be aggregated to various levels, such as the visit or hospital admission, episode of care, or calendar year.

The biometrics systems maintained by the Service branches and the Automated Quality of Care Evaluation Support System (AQCESS) contain disposition records on all patients discharged from military hospitals. AQCESS is a new microcomputer-based system installed in all MTFs designed to collect and report inpatient data similar to those in the biometrics systems. We need to explore the features of both systems before deciding which to use, but one--or, perhaps both--will be used to obtain MTF inpatient utilization data on individuals.

The biometrics systems also contain monthly reports from MTFs on the number of outpatient visits by type of service and beneficiary category. These are aggregate counts and do not contain data on individuals.

The Appointment and Scheduling System, another new system that has been installed in only a few MTFs, provides automated information on outpatient visits to military hospitals and clinics. For the MTFs covered by the evaluation, it will be a convenient source of individual outpatient utilization data. Unfortunately, because it is not likely to be present in all of the facilities covered by this evaluation, its usefulness will be limited.

MTF and Catchment Area Data

The Defense Medical Information System (DMIS) is an automated system containing aggregate data for the MTF catchment areas and the noncatchment area portion of each state. We will use DMIS data to select control areas. The system includes, for each MTF, bed capacity, utilization and expense data by type of medical service, nonavailability statements, projected catchment area population data by beneficiary category, and CHAMPUS outpatient and inpatient utilization and expense data for beneficiaries residing in the catchment area.

The Resource Analysis and Planning System (RAPS) projects military beneficiary populations and forecasts health care resource requirements by catchment area. It draws upon several information systems for baseline data, including DEERS, CHAMPUS claims, and the biometrics systems. The RAPS data are more disaggregated but otherwise are similar to some of the data contained in DMIS.
The Medical Expense and Performance Reporting System (MEPRS) is an automated reporting system combining the reporting requirements of the Uniform Chart of Accounts (UCA) and the Uniform Staffing Methodology (USM). The UCA is the primary source of MTF cost and workload information and the USM is the primary source for MTF staffing data. The MEPRS is a relatively new system and the information we have on it suggests that the automated features do not yet cover all facilities. We will use it when we can; otherwise we will rely on the primary systems (UCA and UCM) for the more detailed and current information not otherwise available through DMIS or RAPS.

The Defense Medical Regulating System (DMRS) describes the original catchment areas and destination MTFs for patients sent to referral centers. Using these data, we can adjust as necessary for referrals from the study areas to hospitals in other areas and vice versa.

From other sources, we will obtain data describing the civilian health care system in the study areas. The Area Resource File contains data on the supply of civilian providers. The American Medical Association files detail the characteristics of physicians, and the American Hospital Association maintains data on civilian hospitals. Finally, various directories will be used to identify the availability of PPOs and HMOs in the areas we will be studying.

**PRIMARY DATA COLLECTION**

As described above, we have identified several types of data that are not presently available. Many of these data can be obtained only from beneficiaries. To collect baseline data on beneficiary utilization patterns, access to care, satisfaction, and relevant sociodemographic characteristics, we will field a beneficiary survey to samples from the demonstration and control areas. A first followup survey will collect information in the demonstration areas on CHAMPUS Prime and Healthcare Finder participation after several months of CRI operation. One year after the first survey, we will conduct a second survey that includes the questions at baseline and additional questions targeted to CRI. We will also field two waves of a military physician survey to collect information on resource shortfalls in each major specialty, continuity of care, and the impact of CRI on the physicians' practices.
Beneficiary Survey

The beneficiary survey instrument at baseline will include questions on:

- Use of MTF, CHAMPUS, and other health care services;
- Access to care and continuity of care from MTFs and civilian providers;
- Satisfaction with the MTF system and CHAMPUS;
- Health status of family members covered by CHAMPUS;
- Other health care coverage; and
- Family characteristics such as income, education, length of time in area, and employment.

Many of the questions will be drawn from the RAND Health Insurance Experiment and other evaluations similar to this one. Therefore, their reliability has been tested and, where relevant, we can compare our results with similar data from other populations. Later waves of the survey will also include questions more specifically targeted on CRI, such as:

- Awareness of and participation in CHAMPUS Prime and the Healthcare Finder program; and
- Attitudes toward specific CRI aspects, such as the panel of preferred physicians.

The sample frame for the baseline survey will include all CHAMPUS eligibles living in the demonstration and control areas, primarily active-duty dependents, retirees, and retired dependents. The data for constructing the sample frame and drawing the final sample will come from DEERS and active-duty personnel files, supplemented if possible by local sources of information.

We will employ multistage cluster sampling to draw the survey samples. This will involve several stages of random sampling from the demonstration and control areas. The first stage will sample catchment areas, the second stage will sample zip code areas in catchment and
noncatchment areas, and the third stage will sample households in the selected zip code areas.

The second beneficiary survey, to be fielded several months after the demonstration begins, will be sent to the same individuals surveyed at baseline. The final survey, which we expect to field one year after the baseline survey, will be sent to a new sample that matches the first sample.

Physician Survey

With regard to a number of outcomes, including continuity of care and the availability and use of MTF resources, another important source of information is MTF physicians. One goal of CRI is to enhance MTF physicians' practices, allowing them to see more patients and handle more complex problems. As we described in Sec. III, we will estimate the changes in MTF workloads that appear to be attributable to CRI. However, to gain a better understanding of how and why workloads change or do not change, we will need additional information that can best be acquired through a physician survey.

As with the beneficiary survey, we expect to field two waves of this survey, one at baseline and one after the demonstration has been under way for approximately a year. Similar samples will be drawn in the demonstration and control areas.
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