

FORUM

VA HEALTH SERVICES RESEARCH & DEVELOPMENT

NOVEMBER 1999

DIRECTOR'S LETTER

The Veterans Health Administration, with its large databases, is a unique laboratory for research. In this issue of FORUM, which focuses on tools for research, some of the key players describe some of the efforts underway to improve VHA's valuable database resources, provide guidance on accessing the databases, and illustrate an application involving the National Center for Cost Containment.

Our Commentary Article is co-authored by two Network Directors who are the outgoing and the incoming chairs of the Information Technology Advisory Committee (ITAC). They give a broad overview of VHA databases and the role of the ITAC in setting priorities for new databases. The co-directors of HSR&D's new VA Information Resource Center (VIReC) then explain the research uses of VHA databases. The Director of HSR&D's new Health Economics Resource Center then describes the tools for estimating VA health care costs. We also are pleased to offer some reflections on our capacity-building program for clinicians (career development), by the program's initiator.

VA health services researchers are some of the most skilled in the nation and hold key leadership positions in major professional societies within and outside of the field of health services research. Only through the continued development of these health services research leaders – who know how to apply research tools – can we capitalize on VHA's potential as a research laboratory, and continue to improve the quality and efficiency of our veterans health care system.

*John Demakis, M.D.
Director, VA HSR&D Service*

COMMENTARY

Tools for Research: Information Management at VA

By John Higgins, M.D., VISN 16 Director; Laura Miller, VISN 10 Director; and Anita Weeks, VISN 16 Associate Chief Information Officer

Because research is about the expansion and refinement of scientific knowledge, information management is a critical tool for research. At VA, a highly sophisticated and mostly homegrown computer system, with an integrated clinical database and electronic patient record, not only supports the management and delivery of health care services but serves as an important resource for research. In particular, it supports the activities of the Health Services

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Research and Development Service (HSR&D) in improving the quality of patient care and increasing the efficiency of health care delivery.

The Veterans Health Administration Information Systems and Technology Architecture (VISTA) is used in the day-to-day operations

of all VA Medical Centers (VAMCs). VISTA encompasses the complete information environment at these medical facilities, including workstations and software locally developed by VA employees, as well as commercial, off-the-shelf software and products. In developing software applications, VA applies standards that permit export to all VA medical facilities, technical integration through use of a common database, programming standards and conventions, data administration functions, and specifications that are not vendor-specific platforms. VISTA is a well-integrated clinical system that incorporates all patient-specific information at each VAMC in one easily accessible database.

In addition to the integrated clinical database at each VAMC, VISTA includes several quality management and monitoring modules, an engineering module that provides for equipment management, space and facility management, construction project planning and submission, project tracking, and accident analysis.

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COMMENTARY

Commentary

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There is also a financial module that handles accounting and procurement activities, as well as a prosthetics module that can provide a quick history of prosthetic services and care for each patient and cut down on the time required to repair or replace new or existing devices. Various environmental, security, and other computer systems required for proper management of a complex health care delivery system are included in VISTA.

VA has developed and is implementing an electronic patient record accessed with personal computers through a graphical user interface (GUI). The Computerized Patient Record System (CPRS) allows clinicians instant, online access to patient data. Data elements are captured and stored in local databases as events take place.

As data elements are captured, selected fields are transmitted to the National Patient Care Database (NPCD). The NPCD is housed at VA's Austin Automation Center in Texas, along with many other VA databases. The NPCD comprises inpatient and outpatient data from all VAMCs and includes fee basis data from the Fee-for-Service program. The NPCD data are accessible to all VA programs for statistical and research purposes. HSR&D is an important part of the user community for this database.

This database can be accessed through time-sharing, remote job entry, or through the VA Intranet, as some data elements are available there. A researcher sitting at a computer in any location within the system can make a decision, based on predetermined criteria, to look at a specific group of patients.

Databases Are Resources for Researchers

Most HSR&D staff have intimate knowledge of the data elements

that make up the national databases. They can develop and initiate programs that will go to the database, retrieve specified data elements — such as lab results or pharmacy data — and produce reports that can either be printed out or incorporated in an electronic format for further analysis. For example, in one multi-site study of patients with chronic lung disease, researchers are using local VISTA Health Summary options to extract lab and diagnostic radiology results and transfer them electronically to build a central, analytic database. VA network and medical center staff frequently work with HSR&D on independent studies of specific patient populations. Studies of this type are underway among the VISNs now.

As noted, VA employees historically have developed most of VA's software programs, and there is enormous demand for software development and support from all VA departments, including HSR&D. And like most large organizations, there are never enough available resources on hand to accommodate demand. As the VA Chief Information Officer (CIO) and staff continuously struggled to meet users' needs, it became clear that some method for prioritizing software requests and determining whether to build or buy must be developed. This type of systematic approach would allow staff to meet users' demands in a more timely and systematic fashion.

The Information Technology Advisory Committee (ITAC) was formed to develop this strategy. Among the committee's members are physicians, nurses, network directors, VAMC directors, network clinical services managers, network CIOs, the VA CIO, VA associate CIOs or ACIOs, and several VA Headquarters program managers.

A Screening Committee composed of network CIOs, ACIOs, and technical staff was designated to review all Information Technology requests, and assess their feasibility,

and then forward them to the ITAC with a recommendation based on their feasibility within existing resources. For each request, the Screening Committee does the research, gathers the background information required to make the best possible assessment, and presents its findings to the ITAC for decision and prioritization. This is no small task. At last count, there were some 160 items on the VA CIO's project request list.

VA has a rich information technology infrastructure that supports VA's goal of providing the best care to our patients that resources — both financial and human — allow.

In summation, VA has a rich information technology infrastructure that supports VA's goal of providing the best care to our patients that resources — both financial and human — allow. This system enhances not only the management and delivery of care, but also the myriad activities by VA researchers to maximize the quality, efficiency, and impact of that care. To do this, we employ a complex information management system and very dedicated medical, administrative, and research staff. Most of our medical centers are teaching hospitals that are affiliated with medical schools, and our research and development program is second to none. Finally, we have in place a process for assessing and prioritizing requests to keep pace with new information needs and advances in information technology. As HSR&D continues to grapple with the challenges of operating in an ever-changing health care system, VA's information technology architecture will be right there to support it.

Solid Data, Solid Research: A Response From the VA Information Resource Center

By Diane C. Cowper, M.A., and Denise M. Hynes, Ph.D.
Co-Directors, VA Information Resource Center

VA's research and development program conducts an array of activities that grapple with some of the most difficult challenges in health care research. VA is a world leader in research on aging, women veterans' health concerns, spinal cord injury, post-traumatic stress disorder, and other mental health issues. It has improved medical care not only for veterans but also for the general population at large.

At the VA Information Resource Center (VIREC), we know firsthand the challenges researchers face in understanding and using VA information systems. We believe that many of these challenges can be minimized and mutual benefits derived by including researchers in the earliest stages of information system design.

The Office of the Chief Information Officer (OCIO) is the information management arm of VA responsible for information resources planning, policy, software development, customer support, investigations, and acquisitions that support VA health care. In 1998, OCIO hosted a Data Summit to address data quality problems in VA's information systems. Four major areas were examined: gaps in current information systems, sources of data and problems associated with data input, data management, and data use. Participants represented most key stakeholders in VA health care. The inclusion of HSR&D in both the planning and conduct of the Data Summit program facilitated broad-based discussions of the utility of current and planned information systems to support specific priorities.

Research teams will have to work closely with information tech-

nology experts to continually refine their data needs. Initial activities that focus on identifying data gaps and creating databases will give way to efforts to enhance data collection, improve data standardization, develop new multipurpose databases, re-engineer the current data flow architecture, and develop approaches for profiling and feedback.

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HSR&D's role continues to be critical in providing support to technology and information system resources. HSR&D-funded projects have resulted in valuable references on VA databases for VA researchers. The Database Resource Guides and the Long Term Care Guides, for example, filled an important information gap. In addition, these projects forged relationships with the various information services within VA, making information about new

databases more accessible to researchers. Other HSR&D supported efforts, such as the State of the Art (SOTA) Conferences, serve to build relationships and open communication between the various information stakeholders about existing data resources and future information needs.

Most recently, VA HSR&D established the VIREC, a new field unit created to serve as an information resource and referral center for researchers, clinicians, and managers. We also feel it is imperative to develop a systematic plan for feedback, linkages, and ongoing discussions with the larger VA information infrastructure. We view the VIREC as a leader in this effort.

Much work remains to be accomplished regarding data quality. Additional research needs to be conducted on the integrity of VA data and databases to further build upon VA's firm informatics foundation. The new VIREC will focus more of its efforts on these issues as we enter the next millennium. However, we should also challenge our own researchers to assist in identifying, pinpointing, publicizing, advocating, and correcting data flaws that may exist across the myriad of databases maintained by VA.

To meet VA's goal of becoming the nation's state-of-the-art health care system, we must continue to improve our information systems for better assessment of patient outcomes, quality of care, and customer service. VA's information systems must serve multiple purposes and be easily accessible to many potential users: policymakers, managers, clinicians, and researchers.

METHODOLOGY

Cost Analysis Presents Challenges and Opportunities for VA Researchers

*By Paul G. Barnett, Ph.D., Director; and Sally S. Hui, Technical Writer;
HSR&D Health Economics Resource Center*

To conduct high-quality health economics research, VA must be able to determine its health care costs. Cost-effectiveness analysis requires accurate information on the costs of health care. In addition, VA needs this information to assess program efficiency and to decide whether to make or buy specialized medical care.

Because VA does not routinely prepare patient bills, VA researchers and analysts must rely on other sources to calculate the cost of health care encounters. Three alternatives are available: micro-cost methods; average costing; and the Decision Support System (DSS), a state-of-the-art, computerized cost-allocation system that VA is implementing.

Methods have benefits and limits

The choice of method depends on the level of accuracy required (see table on this page). Micro-costing methods are very accurate, but expensive to employ. Average cost methods are easier to undertake, but the cost estimate may not fully reflect all factors that affect the resources used in providing care.

There are three types of micro-cost methods:

- The pseudo-bill requires detailed utilization data, much like the lines in an itemized hospital bill. The cost of each item is estimated using Medicare reimbursement rates, the charge rates of an affiliated university medical center, or some other non-VA sector source.

- The cost function method requires detailed cost and utilization

data for a specific, non-VA service to simulate the cost of a comparable VA service. However, the appropriate data may not always be available.

- Direct measurement is used to determine the cost of new interventions and programs unique to VA. Staff time and supply costs are measured directly to develop a precise cost estimate, while labor costs are estimated from payroll records. The total cost is then divided by the volume of workload to find the cost per unit of service provided. Relative value units may be needed to estimate the costs of departments that produce a diverse workload.

Because these micro-cost methods are very expensive, they are best used to estimate costs associated with the specific intervention or treatment under study. In a study of methods for treating heart attack, micro-cost methods should

be used to accurately gauge the costs of cardiac angioplasty and bypass surgery. Average costing, on the other hand, can determine costs not directly associated with treatment, such as the cost of long-term care for a patient who subsequently has a stroke.

The average cost method uses only information from the centralized VA utilization databases. As a result, it is simpler to apply than micro-costing.

Unit costs are based on relative values derived from non-VA cost data sets and the department-level cost estimates contained in the VA Cost Distribution Report. The estimate assumes that the average cost of a given encounter is the same as that of all other encounters with the same characteristics. Using this method, the same cost is assigned to all hospital stays in a particular DRG with the same length of stay.

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Methods for Estimating VA Health Care Costs		
Method	Description	Benefits and limitations
Micro-cost	Pseudo bill, cost-function, or direct measurement	Precise but expensive method
Average cost	Combines cost and utilization data with non-VA relative value unit	Data are easily obtained, but method may not be sensitive to all factors affecting cost
Decision Support System	Detailed VA product cost-allocation system	Very detailed, but must be validated; so far is difficult to access

R ESEARCH HIGHLIGHTS

Diabetes Cost and Outcome Reports from the National Center for Cost Containment

By Leonard Pogach, M.D., National Director, VA National Diabetes Program; Ruth Weinstock, M.D., Ph.D., Syracuse VAMC; Gerald Hawley, R.N., M.S.N., NCCC; and Denis Repke, Ph.D., NCCC

Although VA facilities do an excellent job of managing blood-sugar levels among veterans with diabetes, per-patient costs related to glycemic control are increasing, according to the Diabetes Cost and Outcomes Reports produced by the VA National Center for Cost Containment (NCCC).¹ Given NCCC's estimate that 12 percent of all VA's veteran patients have pharmacologically treated diabetes, the challenge for researchers is clear: how to develop diabetes management programs that rein in costs without compromising quality of care.

The NCCC reports are unique in their integration of data on both health outcomes and drug acquisition costs. They were designed to assess the prevalence of diabetes in the VA, identify patterns of pharmacy utilization and costs, determine rates of admissions and procedures for people with diabetes, and, for FY96 and FY98, to link system-level evaluation of laboratory outcomes with pharmaceutical utilization.

The NCCC VA Diabetes Cohort consists of patients identified through facility-level pharmacy data as receiving prescriptions for insulin, sulfonylurea, oral antiglycemic agents (metformin, acarbose, and troglitazone), or blood glucose monitoring supplies. The data extraction program is nearly 100 percent accurate in identifying those patients — and only those patients — with the specified prescriptions. Although the FY98 prevalence and utilization analysis has been expanded to include patients identified by a combination of diabetes-specific prescriptions and ICD9-CM codes, the pharmacy cost data reflect patients identified through the pharmacy file using

acquisition costs.

Pharmacy expenditures related to glycemic control in veterans treated with insulin and/or oral agents increased significantly from 1994 to 1998 in all groups. Overall, per-patient costs related to glycemic control were 22 percent (\$168), 21 percent (\$195), and 27 percent (\$232) of total pharmacy expenditures for 1994, 1996, and 1998 respectively. In 1998, total glycemic control pharmacy costs were \$160 for patients taking oral agents, \$279 for veterans using insulin alone, and \$501 for patients who received both insulin and oral agents. Drug acquisition costs remained stable during this time.

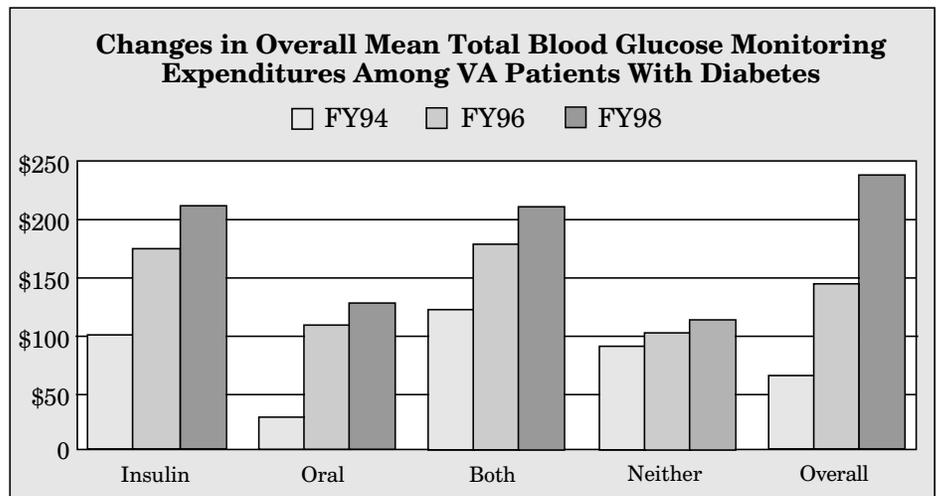
Pharmacy costs include the costs of glucose monitoring supplies as well as medications. The graph below shows the increasing mean costs of annual blood glucose monitoring supplies among VA patients with diabetes treated with insulin and/or oral agents from 1994 to 1998. During this period, the unit cost for monitoring supplies remained relatively stable. In FY 1994, mean annual expenditures for these sup-

plies were \$67; these costs increased to \$149 and \$170 in FY 1996 and 1998, respectively. The costs of glucose monitoring supplies were 11 percent, 20 percent, and 19 percent of total pharmacy costs for these veterans in 1994, 1996, and 1998, respectively.

The highest costs were observed in patients using insulin with or without oral agents (\$215 and \$213, respectively, in 1998). In 1998, for patients self-administering insulin, taking oral agents, or using both, costs of glucose monitoring were 76 percent, 80 percent, and 43 percent, respectively, of all glycemic control expenditures. Overall, in 1998, self-monitoring expenditures represented 73 percent of total annual glycemic control pharmacy costs. Since the unit cost of monitoring strips did not significantly increase, these higher expenditures reflect an increase in the quantity of supplies dispensed.

During the same study periods, glycemic control, as measured by overall HbA1c values, improved sig-

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Reflections on the HSR&D Career Development Program

By Daniel Deykin, M.D.

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There is an old saying: “Be careful what you wish for — you may get it.” When I became Director of the HSR&D Service, I wished that we could start a Career Development program. I envisioned it as similar to the Medical Research Service’s program and to the Career Development Awards of the National Institutes of Health, one of which launched my own research independence. But our budget was too constrained.

In 1990, our HSR&D budget received its first major adjustment, an increase of \$5 million that effectively doubled it. Shirley Meehan and I were then able to launch the program. Our goal was to invest approximately 10 percent of our budget in Career Development awards.

Our initial strategy was to recognize rising health services research stars within the VA, and to advance their careers by affording them relatively unfettered time for research. We recognized that they needed to stay relevant to their home Medical Centers, so we required that they give 25 percent of their time (but no more) to clinical activities at their home base. Soon, we were able to extend the program to non-clinical research scientists, and then, to a second tier of investigators. These researchers were more junior than the “stars,” but still luminaries who had demonstrated their interest and capacity for health services research by completing rigorous training in a related discipline, and by completing and publishing papers in critically edited journals.

Our not-so-subtle intent was not only to advance VA’s capacity for health services research, but also to retain those bright individuals who might be tempted to leave the system for putatively greener pastures elsewhere. (I have always believed

our pastures were the best for nourishing health services research, but we always seem to have to justify our excellence.) By creating a cadre of health services researchers within the VA, we hoped they would demonstrate the value of research in informing VA policy and decision-making.

The Career Development program is a gem. Like any other valuable asset, its worth is clear, but it needs to be protected.

Fortunately, we got what we wished for. The initial class of investigators proved to be as stellar as we had hoped. Over the years, HSR&D’s budget has increased steadily to its present level of over \$40 million, and the Career Development program has grown proportionately. It has been my pleasure to have attended, first as director, and then as a willing recruit, virtually all the meetings of the review committee we set up to select the successful candidates, to monitor their progress, and to make recommendations on how the program should be shaped. We have had extraordinary applicants, and they have met and exceeded our most ambitious expectations.

As you know, the old saying has a down side as well. In another iteration, it is expressed as a curse: “May you get what you wish for.” It would be ludicrous to see anything but good outcomes from the program to date, but, characteristically, I want to raise some caveats as the program continues to expand. I hope these will be taken in the spirit in which they are given — as

expressions of support, not criticism.

1. We must be careful not to make the Career Development program a training program. If it is to meet its goals, and to serve as a medium to recognize excellence, we must adhere to strict requirements for the award. If there are sufficient funds to start or enhance training programs, that should be the path for junior investigators. There will always be pressure to use Career Development for junior staffing, but eroding the base of entry requirements will inevitably weaken the entire structure.

2. We must be careful to protect the independence of the awardees. As the excellence of their work receives increasing recognition, they can be co-opted by the system itself — locally, at the VISN level, or at headquarters. They should be useful to high-level administrators, but always independent if they are to provide the dispassionate analysis that makes them and their work relevant. I know that this argument is annoying to some people, but, Cassandra-like, I continue to preach it.

3. We need to find new ways to enhance the program. For starters, I would like to see more sabbatical opportunities for intellectual enrichment made available to the awardees. I would also like them to have more opportunities to participate in Congressional activities, both to expand their horizons, and to inform (and impress) members of Congress and their staffs about the excellence of the HSR&D Service and, more importantly, how the VA can serve as a model for understanding complex health systems.

The Career Development program is a gem. Like any other valuable asset, its worth is clear, but it needs to be protected.

Research Highlights

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nificantly. In FY 1998, the mean fasting HbA1c value among veterans from 105 facilities was 7.8 percent, compared to 8.4 percent in 1996. The mean values were lower in patients on oral agents, and highest in patients on insulin. In regression analysis the monitoring costs were correlated with higher HbA1c values in both groups, suggesting that clinicians monitored their highest risk patients more frequently. It was not possible to evaluate the effect of monitoring upon HbA1c levels using the cross-sectional data; longitudinal analyses are planned.

The challenge for researchers is clear: how to develop diabetes management programs that rein in costs without compromising quality of care.

Increasing costs may result, in part, from the introduction of newer, more expensive oral agents, primarily metformin. Although acarbose was introduced in 1996 and troglitazone in 1998, the use of these drugs remained relatively small, and their unit price did not change significantly, while sulfonyureas costs decreased. The VA Clinical Practice Guidelines, which were available during this time, recommended initiation of oral therapy with sulfonylurea drugs, which are the least expensive oral glycemic control medications. Met-formin was considered the second-line oral agent. The unit price of the most commonly prescribed oral glycemic control medication, glyburide, decreased during this time.

However, the greatest change was the rise in expenditures for monitoring supplies. The percent-

age of patients using self-monitoring supplies and the unit cost of monitoring supplies did not change significantly, but the overall number of monitoring strips dispensed significantly increased. It is unclear whether all these strips were necessary and/or used by all patients. The increased use and cost of monitoring supplies, however, represented a major source of the higher pharmacy costs.

These results have immediate and direct implications for the treatment of veteran patients with diabetes. First, the average age of the veteran with diabetes in the VA is 67, and the prevalence of diabetes increases with age. Second, although VA formulary guidelines did not prevent clinicians from prescribing medications for a specific

patient, they recommended a sequence of sulfonyurea agents, metformin, and troglitazone for persons with type 2 diabetes, based upon the effectiveness of the medications. In addition, while recognizing that monitoring may be beneficial for an individual patient with type 2 diabetes, the guidelines emphasized that no controlled studies have ever demonstrated a benefit. Even so, there was a significant increase in glycemic control costs. Hopefully, VA researchers will be able to use these data in their continuing efforts to improve the quality and efficiency of diabetes care for veterans.

¹The NCCC recently changed its organizational name to the Health Care Analysis and Information Group.

Quality is Focus of HSR&D Annual Meeting

How can health services research advance the quality of VA health care? Find out at the HSR&D Service 18th Annual Meeting, *Systematizing Quality in Health Care: Approaches that Work*, to be held March 22-24, 2000, at the Renaissance Washington DC Hotel, Washington, DC.

Throughout the conference, attendees will be encouraged to articulate the linkages between scientific activities, VA policy development, and clinical service delivery. The program will feature invited speakers, competitively selected oral and poster presentations, workshops, and exhibits.

Deadline for registration is Jan. 25, 2000. Additional information on registration, pre-meeting activities, and special interest round tables is available at the HSR&D web site, www.va.gov/resdev/hsrd2k.htm.

AHSR 2000 Annual Meeting: Health Care in the New Millenium

Learn about cutting-edge research and debate current policy issues at the AHSR 2000 Annual Meeting, *Research to Action: Shaping the Health System in the New Millenium*, to be held at the Westin Bonaventure in Los Angeles, June 25-27, 2000.

Interested in presenting your latest research findings? Watch for the AHSR Annual Meeting Call for Abstracts brochure, due out early November. Abstracts are due Jan. 14.

Visit the AHSR website, www.ahsr.org, or call 202/223-2477 to request the call for abstracts and conference brochure.

Methodology

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VA researchers are now examining the DSS to determine if its cost data will be useful. More than 400 VA staff are involved in creating DSS, undertaking the difficult task of assigning costs to VA health care products and services. DSS cost estimates are only as good as the data in VA's data systems, which sometimes lack information on inpatient procedures. Another issue is the difficulty of accessing DSS data, which are separated into 22 regional databases.

The lack of a uniform VA policy on DSS access poses another problem for researchers. A draft policy is under review. When that policy is enacted, and when a national-level encounter extract of DSS estimates is released and validated, researchers will be able to make much better use of DSS cost data.

Several resources on cost-effectiveness analysis are available to VA researchers. They should be sure to consult the U.S. Public Health Task Force Guidelines on *Cost-effectiveness in health and medicine*. HSR&D has developed an informational paper, *Cost Analyses: Information for Applicants and Reviewers*, for applicants and reviewers of cost studies. A special April 1999 supplement to the journal *Medical Care* describes VA cost methods.

Health Economics Resource Center Will Help Shed Light on VA Costs

The new HSR&D Health Economics Resource Center (HERC) is a national center dedicated to improving VA's capacity to conduct high-quality health economics research and cost-effectiveness studies. The research supported by the Center will help VA evaluate the efficiency of VA programs and providers, as well as make better-informed decisions about whether new health care interventions are sufficiently cost-effective for use throughout the VA system. Initially, HERC will focus on helping researchers determine the costs of VA health care. The Center will offer training courses, publish handbooks, support micro-cost methods, and provide cost estimates for VA hospital stays and outpatient visits.

Information about the Center may be found at: <http://www.palo-alto.med.va.gov/herc>. Its research consulting service will open on Jan. 3, 2000, when it may be reached by calling 650/617-2630 or by sending e-mail to herc@mailsvr.icon.palo-alto.med.va.gov. HERC is located at the VA Palo Alto Health Care System in Menlo Park, Calif.

Information on how to obtain these publications can be found on the web page of the new VA Health Economics Resource Center. (See box above.)

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Forum is a Publication of the VA Office of Research & Development, Health Services Research & Development Service, Management Decision and Research Center, in conjunction with the Association for Health Services Research.