

# Evaluation of the Quality of Care in the Clinical Care Centers of the National Centers of Excellence in Women's Health

## **Roger T. Anderson, PhD**

Department of Public Health Sciences  
Wake Forest University School of Medicine  
Winston-Salem, North Carolina

## **Carol S. Weisman, PhD**

University of Michigan School of Public Health  
Ann Arbor, Michigan

## **Sarah Hudson Scholle, DrPH**

Magee Women's Hospital  
University of Pittsburgh  
Pittsburgh, Pennsylvania

## **Jillian T. Henderson, MPH**

University of Michigan School of Public Health  
Ann Arbor, Michigan

## **Robert Oldendick, PhD**

Survey Research Lab  
University of South Carolina  
Columbia, South Carolina

## **Fabian Camacho, MS**

Department of Public Health Sciences  
Wake Forest University School of Medicine  
Winston-Salem, North Carolina

**Abstract** This study evaluated the quality of primary care services provided in 15 National Centers of Excellence in Women's Health (CoE) clinical sites in operation in 2001 using self-reported clinical preventive services and patient satisfaction as indicators of quality of care. A sample of 3,111 women served by the CoE program was surveyed and compared with quality of care benchmarks from national and local community surveys. The benchmark surveys were: a nationally representative sample of 2,075 women from the 1998 Commonwealth Fund Survey of Women's Health; a community sample of women who lived within a geographical catchment area for three CoEs; and a sample of 71,438 women in the 1999 Consumer Assessment of Health Plans Study (CAHPS) of commercial managed care plans. Adjusting for region, age, education, perceived health status, and managed care enrollment, women in the CoEs were

© 2002 by the Jacobs Institute  
of Women's Health  
Published by Elsevier Science Inc.  
1049-3867/02/\$22.00  
PII S1049-3867(02)00154-8

more satisfied with their care and had received significantly more screening tests and counseling services than women in the benchmark samples. The largest effects among primary care services were for physical breast examination, mammogram (ages 50+), and counseling for smoking, domestic violence, and sexually transmitted diseases.

One of the core components of the Department of Health and Human Service (DHHS) National Centers of Excellence in Women's Health (CoE) program is the provision of comprehensive, multidisciplinary primary care services in women-friendly settings.<sup>1</sup> These clinical centers are expected to improve the quality of care for women by filling gaps and reducing redundancies in services, as well as by providing care in an environment in which clinicians collaborate, are sensitive to women's biopsychosocial needs, and are aware of women's health research findings. This article presents results of the first study of the quality of care provided in the 15 CoE clinical centers that were in operation in 2001.

## BACKGROUND

Women's health care is often both complex and compartmentalized. Because of the traditional separation of reproductive and nonreproductive health care, women often must rely upon multiple providers who may work in different settings and whose services are not necessarily coordinated.<sup>2</sup> A recent national survey of women ages 18 and over found the percentage of women who saw both a generalist physician (family practitioner or internist) and an obstetrician/gynecologist (ob/gyn) for their regular care ranged from 49% in managed care plans to 29% in traditional fee-for-service plans.<sup>3</sup> Studies also have shown that women seeing both a generalist and an ob/gyn receive more recommended clinical preventive services than women seeing a generalist alone.<sup>4-6</sup>

The Institute of Medicine defines primary care as the point of first contact with the health system, providing ongoing care for new and old problems, identifying and coordinating specialty health care needs, and providing comprehensive services.<sup>7</sup> The organization of specialized primary health care "centers" for women represents a structural approach to addressing the need for improved coordination and comprehensiveness in women's health. These centers emerged in the 1960s and 1970s with the establishment of community-based health programs.<sup>8</sup> A second wave of women's health centers appeared in the 1980s and 1990s when hospitals began to establish programs providing a range of educational and clinical services for women.<sup>9</sup> By 1994, 32% of U.S. hospitals reported having a women's health center of some type.<sup>10</sup> In 1994, the National Survey of Women's Health Centers estimated that there were about 432 comprehensive primary care women's health centers in operation, including both hospital-affiliated and freestanding models.<sup>11</sup>

Since 1996, the DHHS CoE program designated 18 academic health centers throughout the United States and Puerto Rico as CoEs to develop standards for comprehensive, multidisciplinary, and culturally competent approaches to women's health across the life span. CoEs differ in structure and include "one-stop shopping" models, in which comprehensive services are co-located in one facility, and "centers without walls," in which networked services are located in different sites but share a common philosophy of women's health care.<sup>12</sup>

In a survey of the 15 CoE clinical centers in operation in 2001, Squires<sup>13</sup> found that most physicians in the centers were female, with four centers having no male medical staff. Most centers had registered nurses and nurse practitioners, and at least one mental health provider on staff, and several

employed other personnel (e.g., radiology technologists, nutritionists, social workers, and counselor/health educators). All CoE clinical centers provided a range of clinical services, and most had on-site radiology, laboratories, and translator/interpreter services. Patients served represent all life stages, although adolescents and women over age 65 were the smallest segments of the patient population served. Six of the CoEs reported serving patients who are predominantly women of color.

To date there have been relatively few studies of whether modern center-based models for women's health care, including the CoEs, add value to the conventional array of clinic and center-based services accessed by women in the community at large. Two recent studies comparing women served in a women's health center with women served in general internal medicine practices measured differences in clinical preventive services received and patient's satisfaction with care.<sup>14,15</sup> The results of these studies suggest that women's health centers may modestly improve women's receipt of some clinical preventive services and some dimensions of satisfaction with care.

This article reports the first analyses of the quality of care provided in the CoEs and addresses whether a specialized women's health program can improve the quality of care for women. Quality of care is defined here in terms of receipt of age-appropriate clinical preventive services and satisfaction with care. Medical textbooks and practice guidelines are defining the scope of women's health care and appropriate preventive services for women, and these standards may be used as a basis for examining quality of care. Most notably, the U.S. Preventive Services Task Force<sup>16</sup> issues evidence-based guidelines for screening tests, counseling, immunizations, and chemoprophylaxis in primary care for patient groups defined by age and gender. The American College of Obstetricians and Gynecologists (ACOG) provides guidelines for women's primary and preventive care across the life span.<sup>17</sup> Additional guidelines pertain to specific conditions, such as heart disease prevention.<sup>18</sup> Likewise, women's satisfaction with health care has been explored in recent work that has identified women's expectations for their care<sup>19</sup> and sources of dissatisfaction, and has led to the development of a new patient satisfaction tool.<sup>20,21</sup>

The purpose of this study is to measure the key primary care services received by women in the CoEs, as examples of comprehensive primary care women's health centers. Two general hypotheses guide this study: 1) women served in CoEs receive more recommended clinical preventive services and report higher satisfaction with care compared with women in community samples; and 2) stronger primary care relationships with a CoE (e.g., having used the for a longer time period) are associated with more clinical preventive services received and higher satisfaction with care.

## METHODS

This observational study evaluates the quality of primary care services provided in 15 CoE clinical sites in operation in 2001. Two approaches are used to compare the quality of care in the CoE with care generally available in the community. In the first approach, self-report data on use of clinical preventive services among women served by the CoE program were compared with benchmarks obtained from a nationally representative sample of women from the 1998 Commonwealth Fund Survey of Women's Health<sup>22</sup> and from a local community sample of women who lived within a geographical catchment area for three CoEs. In addition, levels of patient satisfaction in the CoE sample were compared with the 1999 Consumer Assessment of Health Plans Study (CAHPS) national dataset of managed care enrollees, as well as against the

local community sample that corresponded to three CoEs. In the second approach, analyses were conducted among women served in CoEs to assess whether the strength of their primary care relationship with the CoEs is related to receipt of preventive services and satisfaction with care.

### **CoE Clinical Sample**

All of the 15 CoEs in operation in 2001 participated in this evaluation under institutional review board approval from each institution and the survey center. For the CoE clinical sample, women 18 years of age and older who had made at least one primary care visit at the CoE within the prior year were eligible for the survey. Excluded from the survey were women who had no visits to the CoE during the past year or whose most recent CoE visit was solely for: an emergency visit, dropping off a specimen, a single procedure such as contraceptive injection, flu shot, a mammogram, allergy shot, or a visit with an allied health service such as physical therapy. Also excluded were patients who did not see a doctor, nurse practitioner, nurse midwife, or physician's assistant at the most recent visit.

A target of 200 completed surveys was sought for each CoE. A sampling frame was assembled of all patient visits during the last 3 months (for two sites this time frame was extended because of patient volume), and a random sample of up to 400 names was selected for telephone contact and eligibility screening. A recruitment database containing names and identifying information for potentially eligible participants was kept separate, and these data were deleted from the recruitment database after the survey was completed or the callback protocol was fulfilled. Three centers required an "opt-out" process in which patients received mail notification of the planned telephone survey and were able to call or write to have their name removed from the list. The proportion of women who requested the latter ranged from 1% to 11% of all addressees. One site required an "opt-in" process where patients were systematically given a form to complete asking permission to contact them for this research study. For the latter site, more than one-third (37%) of the patients did not complete the card and therefore did not authorize contact. The surveys were conducted between August 2001 and January 2002.

The telephone interview was conducted using computerized telephone interviewing (CATI) at the University of South Carolina Survey Research Laboratory and required an average of 15 minutes to complete. Attempted telephone calls were made at different times of the days and on different days of the week in order to reach women who may be away from home on a regular basis. A minimum of 15 attempts were made. If the selected respondent was not at home or was otherwise unable to complete the interview at the time of the initial contact, a callback time was scheduled and repeated attempts, as necessary, were made to complete the interview. The overall response rate (defined as the number of completed interviews out of the total number of completed and partial interviews and refusals) was 70.7% and varied across sites from 57.7% to 84.7%.

### **Benchmark Data Sources**

#### *Commonwealth Fund Survey*

The 1998 Commonwealth Fund Survey of Women's Health (CWF)<sup>22</sup> was the primary comparison dataset used. The CWF was conducted in May–November 1998 by Louis Harris & Associates, Inc., using random digit dialing and CATI, and it provides one of the most comprehensive sets of indicators of primary care services in women's health. The CWF is a weighted, nationally represen-

tative survey of 2,256 women ages 18 years and older in the 48 contiguous states. Stratified sampling procedures were used to obtain a representative sample, taking into account households with listed and unlisted telephone numbers and geographic location (region, central city, suburban, and rural residents). The CWF oversampled minority women ages 18 and older, including 429 African-American, 404 Hispanic, and 400 Asian-American women. The completion rate (number of completed interviews divided by the number of completed interviews plus refusals and terminated interviews) for the cross-section sample is 55% overall. Population weights for the CWF data come from the 1997 Current Population Survey (U.S. Census Bureau) for age, race/ethnicity, education, insurance status, and geographic region to produce representative results for the 104 million women, ages 18 and over. For purposes of this study, benchmarks in women's health care were computed based on a subsample of the weighted sample of women who reported that they had made at least one physician visit in the past 12 months ( $n = 2,075$ ).

### *Consumer Assessment of Health Plans Study*

Global patient satisfaction in the CoE is benchmarked with a single item from the 1999 CAHPS adult survey administered by the National Committee for Quality Assurance (NCQA), which assesses consumers' experiences with and ratings of their managed care health plans.<sup>23</sup> The 1999 CAHPS was conducted in 206 commercial managed care health plans nationwide on 71,438 women ages 18 and over who were continuously enrolled in their health plans for the 12 months of the reporting year. Because the CAHPS data are collected for managed health care enrollees, only women in the CoE who are enrolled in managed care plans are included in the CAHPS benchmark analysis.

### *Community Comparison Sample*

Local community comparison surveys of women age 18 years and older were conducted, concurrently with the CoE clinical survey, in communities served by three CoEs. (Funding limitations precluded comparison samples for all CoEs.) The three communities were selected to include a diverse sample in terms of region, urban density, and socioeconomic status. A target of 200 completed surveys per community was sought using random digit dialing and comparable inclusion and exclusion criteria as above. Participants were required to have at least one primary care visit during the past year. A total of 611 interviews were completed fulfilling the study goal of 200 completed surveys per selected community. The response rates for the three community surveys were 52.1%, 53.9% and 59.3%. For benchmark comparisons with the CoE clinical sample, only patients sampled from the three selected CoEs are compared with the local community sample. (This subset of CoE patients is hereinafter referred to as the "CoE clinical subsample.")

## **MEASURES**

A survey instrument was developed to collect data on quality of care and strength of the patient's primary care relationship with the CoE. For the benchmark items, the CoE clinical sample survey used the exact wording of questions in the benchmark surveys.

## **Demographics and Background Variables**

Participants verified age and reported race/ethnicity, marital status, employment status, education, income, and whether children under 18 were living in the household. Perceived general health status was assessed using a single item rating on a 5-point scale from excellent to poor. Women were also asked to indicate all the types of insurance coverage they had (including Medicaid, Medicare, private, and other insurance) and whether any of their insurance plans was a health maintenance organization, preferred provider organization, or another type of managed care plan. Participants also indicated whether they had been uninsured at any point during the previous year. The total number of health care visits during the year, reason for the most recent visit (grouped as prenatal or postpartum care, routine examination or screening tests, treatment for a new health problem or injury, or follow-up care for an ongoing health problem), and type of health care provider also were measured.

For women in both the CWF and the community comparison sample, the type of regular doctor or health professional was coded by specialty (generalist, ob/gyn, other, or no regular provider) and gender (female versus male). For women in the CoE clinical sample, this was coded for the regular health professional seen at the CoE.

## **Quality of Care Measures**

Quality of care was defined in terms of 1) receipt of age-appropriate clinical preventive services generally recommended for women by such groups as the U.S. Preventive Services Task Force, and 2) global satisfaction with care rating. For the comparisons between the CoE clinical subsample and the community sample, and for the analysis of the strength of CoE primary care relationship, ratings on a woman-specific measure of primary care satisfaction also were examined.<sup>20,21</sup>

### ***Screening Services***

The health care services benchmark items are identical to the 1998 CWF survey. Screening services assessed for all women ages 18 and over included routine physical examination, Pap smear, physical breast examination, and blood cholesterol test. For women ages 50 and older, age-appropriate services also included mammogram and colon cancer screening. Women were coded "yes" for the screening services if they had received the service during the past 1, 3, or 5 years depending upon prevailing recommendations. For the analyses of the primary care relationship, receipt of preventive services was coded as high (all age-appropriate services received during the specified time period) versus other (any age-appropriate service not received.)

### ***Preventive Counseling***

Topics (with items identical to the CWF survey) include smoking or quitting smoking, diet and weight, exercise, alcohol or drug use, calcium intake, domestic violence, and sexually transmitted disease. For women ages 40 and over, hormone replacement therapy is also included. Women indicated whether a doctor or other health professional had discussed each topic with them during the past 12 months. For the analyses of the primary care relationship, receipt of counseling services was coded as high (received counseling on greater than 50% of age-appropriate topics during the past year) versus low (50% or less of age-appropriate topics.)

## ***Patient Satisfaction***

Global patient satisfaction was assessed in the CoE clinical sample and in the community comparison sample using one item from CAHPS: “We want to know your rating of all your health care in the last 12 months from all doctors and other health providers. Use any number from 0 to 10, where 0 is the worst health care possible and 10 is the best health care possible. How would you rate all your health care?” Consistent with NCQA convention, results on this item are reported as the percentage of health plan enrollees who respond with scores of 8, 9, or 10.<sup>23,24</sup>

In the CoE clinical sample and the community comparison sample, a new measure was added from the recently validated Primary Care Satisfaction Survey for Women (PCSSW) to assess women’s satisfaction with care comprehensiveness and coordination of care. The PCSSW was developed through focus groups and cognitive interviews with women from across the country.<sup>20,21</sup> Items address topics specific to women (such as “the chance to get both gynecological and general health care here”) and topics important to women but not gender-specific (such as “the health professional’s interest in my mental and emotional health”). The PCSSW Care Comprehensiveness and Coordination scale has 10 items that are rated on a five-point scale from 1 (not at all satisfied) to 5 (extremely satisfied), with a total possible score of 50. The scale has excellent internal consistency ( $\alpha = 0.95$ ), discriminates well among women with high versus low comprehensiveness of services, and adds substantially to generic tools in explaining statistical variance in global satisfaction ratings (Scholle, Anderson, and Weisman, unpublished data). The mean scale score was obtained by summing the items and dividing by the number of nonmissing items. For purposes of this report, the scale score distribution was dichotomized as high/low at the 80th percentile.

## **Primary Care Relationship with CoE**

Because previous literature suggests that the nature of the primary care relationship may affect quality and satisfaction with care, we assessed the strength of the woman’s primary care relationship with the CoE by examining the primary care domains of first contact care and longitudinality.<sup>25</sup> Women were considered to use the CoE for first contact care if the CoE was their only regular place for care, as compared with women who used the CoE in combination with other sites, who used other sites as their regular place, or who did not have a regular place of care. Longitudinal relationship was assessed by determining the length of time the woman had been seen at the CoE, dichotomized as two years or greater versus a shorter period of time.

## **ANALYSIS**

Comparisons of proportions of women seen in CoEs versus women in the benchmark samples are conducted using a logistic regression modeling approach. Data were analyzed using Stata statistical software<sup>26</sup> and SAS.<sup>27</sup> The CoE clinical sample is separately merged with each benchmark sample, and adjustments are made to facilitate comparability and to account for the design features of each sample. To account for lack of independence among observations within the CoE sites (or clusters), robust variances are estimated using linearization methods developed for the analysis of complex survey data. Complex survey design features of benchmark data sources (such as weights, strata, and clusters in the CWF sample and clusters in the CAHPS sample) also

are accounted for using statistical methods that obtain accurate design-based estimates.

The  $t$  test ( $p < 0.05$ ) for significance of the regression coefficient for the CoE clinical sample indicator variable provides the statistical test of a CoE effect in all comparisons. The adjusted mean proportions of patients who reported receiving each screening test or counseling service for the CoE clinical sample versus the benchmark comparison samples are computed from the regression model, setting all control variables at their means. The models are adjusted for the following: region, age, education, perceived health status, and managed care enrollment. These covariates were selected because they are known from prior research to be associated with receipt of clinical preventive services or with satisfaction with health care, and because women in the CoE clinical sample were likely or known to differ significantly from women in the comparison samples on these variables. For example, satisfaction with health care is known to vary by region of the country, and lower satisfaction is reported by younger persons, by those with higher educational levels, by those in poorer health status, and by managed care enrollees (compared with those in fee-for-service health plans). Receipt of some clinical preventive services also varies by region, age, education, and type of health plan. Adjusting for these variables reduces the likelihood that unmeasured differences between samples affect the results.

For analyses using the CWF survey to benchmark screening and counseling, the CWF sample includes women reporting at least one medical visit in the last 12 months, consistent with the derivation of the CoE clinical sample. For analyses using the community comparison sample to benchmark screening, counseling, and satisfaction, pooled data from the community comparison surveys are compared with pooled data from the CoE clinical subsample. Region is controlled in these analyses by including indicator variables for each of the three sites in all regression models. As in the other analyses, the models are adjusted for age, education, perceived health status, and managed care enrollment.

Analyses of the dichotomized CAHPS satisfaction item score (i.e., proportion of respondents scoring 8–10 versus all lower scores) were performed on women age 18 and older having made at least one health plan visit in the past year, and adjusted for the standard set of model covariables described above. The CoE clinical sample comparisons are limited to women who are enrolled in commercial managed care plans for the CAHPS item only. Excluding women not enrolled in managed care plans is important for these comparisons because managed care enrollees tend to report lower satisfaction than women in traditional fee-for-service health plans, and CAHPS was developed to assess satisfaction in managed care. The item is benchmarked in two different comparisons. First, the entire CoE survey sample is compared with the 1999 CAHPS data. Second, the CoE clinical subsample is compared with the community sample.

To interpret the meaningfulness of statistically significant differences found between samples, we used Cohen's  $d$  effect size statistic.<sup>28</sup> A value of 0.15 was held to indicate a small change or difference between groups. For each survey item used to assess quality of care, the effect size statistic was calculated by taking the difference in proportions between the CoE and benchmark sample, and dividing it by the standard deviation of the benchmark sample for that item. Some agencies compiling health care services report card information have adopted a change of 10% over baseline as a small meaningful change.<sup>29–31</sup> We apply the latter relative change as an additional informal criterion to assess the magnitude of difference between the CoE and benchmark samples.

To assess the effects of strength of the primary care relationship with the CoE, Generalized Estimating Equations (GEE) models were estimated in order to examine the relationship of first contact care and longitudinality measures to indicators of quality of care. The GEE method was used to take into account correlated observations due to CoE site clustering while simultaneously controlling for patient covariates used in the benchmark analyses above and the specialty of the regular provider at the CoE.<sup>32</sup> The SAS procedure GENMOD was used to fit the GEE models.

## RESULTS

Information on the demographic characteristics of the CoE clinical sample and the CWF sample of women reporting at least one visit with a physician in the last 12 months is presented in Table 1. The mean age of respondents is approximately 45 years in both samples (ranging from 18 to over 90 years of age). Compared with the CWF sample, patients in the CoE clinical sample include a higher percentage of nonwhite women (African-American and Hispanic), were somewhat less likely to be unemployed (37% versus 41% in the CWF), had a higher proportion of college graduates (56% versus 21%), and were more likely to be in the higher income categories (e.g. 11% versus 4% reported an annual household income of \$75,000 to \$100,000).

Descriptors of respondent's health insurance and provider type shown in Table 2 indicate that CoE patients were less likely to be uninsured than those in the CWF survey (4% versus 14% in the CWF) and more likely to be covered by private insurance (67% versus 53%). The proportions of respondents with public-sponsored insurance (Medicare and Medicaid) were similar. More striking differences between the CoE clinical sample and the CWF sample were found for enrollment in a managed care plan (78% versus 48%) and having a female physician (92% versus 24%).

### Screening and Counseling Services

Table 3 presents the adjusted means for screening and counseling services within the recommended time interval. Adjusting for region, age, education, perceived health status, and managed care enrollment, a statistically significant higher proportion of women in the CoE clinical sample report receiving all six screening tests compared with women in the CWF sample. Likewise, women in CoEs were more likely to report counseling for smoking cessation, exercise, alcohol or drug use, domestic violence, and sexually transmitted disease. Effect sizes above 0.15 were found for Pap tests, physical breast examination, mammogram, and smoking cessation counseling.

Table 4 presents the adjusted means for comparisons of the CoE clinical subsample and the community comparison sample. A higher proportion of women in CoEs had received four of the six screening services (Pap test, physical breast examination, mammogram, and colon cancer screening) and four of eight counseling services (hormone replacement therapy, alcohol or drug use, domestic violence, and sexually transmitted disease). Effect sizes above 0.15 were found for physical breast examination and mammogram, as well as for counseling for alcohol or drug use, domestic violence, and sexually transmitted disease.

### Patient Satisfaction

Table 5 shows the results for the benchmarked CAHPS item for women enrolled in non-Medicaid managed care plans. A higher proportion of women

**Table 1.** SELECTED DEMOGRAPHIC AND DESCRIPTIVE CHARACTERISTICS OF THE CoE CLINICAL SAMPLE AND CWF SAMPLE

	CoE Clinical Sample (n = 3,111)		CWF Sample (n = 2,075)	
	Mean or Proportion	95% CI	Mean or Proportion	95% CI
Mean age	45.24	(44.66, 45.81)	45.41	(44.56, 46.26)
Ethnicity				
White, non-Hispanic	0.552	(0.54, 0.56)	0.729	(0.71, 0.75)
African-American, non-Hispanic	0.242	(0.23, 0.25)	0.125	(0.11, 0.14)
Hispanic	0.117	(0.11, 0.12)	0.086	(0.08, 0.10)
Asian/Pacific Islander	0.039	(0.04, 0.04)	0.031	(0.03, 0.03)
Other	0.051	(0.05, 0.05)	0.029	(0.02, 0.04)
Marital status				
Married/living with partner	0.544	(0.54, 0.55)	0.566	(0.54, 0.59)
Single	0.204	(0.20, 0.21)	0.187	(0.17, 0.21)
Widowed/separated/divorced	0.250	(0.24, 0.26)	0.247	(0.23, 0.27)
Employment status				
Employed	0.628	(0.62, 0.64)	0.588	(0.57, 0.61)
Not employed	0.372	(0.36, 0.38)	0.412	(0.39, 0.43)
Children under 18 years in household	0.374	(0.37, 0.38)	0.400	(0.38, 0.42)
Education				
Less than high school	0.084	(0.08, 0.09)	0.186	(0.17, 0.21)
High school/some college	0.356	(0.35, 0.36)	0.604	(0.58, 0.63)
College graduate/more	0.560	(0.55, 0.57)	0.210	(0.19, 0.23)
Income				
\$10,000 or less	0.153	(0.15, 0.16)	0.126	(0.11, 0.14)
\$10,001 to \$20,000	0.127	(0.12, 0.13)	0.170	(0.15, 0.19)
\$20,000 to \$30,000	0.110	(0.10, 0.12)	0.120	(0.10, 0.13)
\$30,001 to \$40,000	0.106	(0.10, 0.11)	0.154	(0.14, 0.17)
\$40,001 to \$50,000	0.093	(0.09, 0.10)	0.106	(0.09, 0.12)
\$50,001 to \$75,000	0.154	(0.15, 0.16)	0.124	(0.11, 0.14)
\$75,001 to \$100,000	0.114	(0.11, 0.12)	0.044	(0.04, 0.05)
\$100,001 or above	0.143	(0.14, 0.15)	0.040	(0.03, 0.05)

CI = confidence interval.

in the CoE clinical sample were highly satisfied with their health care, compared with women in the CAHPS sample (81% versus 73%), and a higher proportion of women in the CoE clinical subsample were highly satisfied, compared with women in the community comparison sample (86% versus 79%). NCQA reports a plan-level mean proportion on this item of 70.2%, with health plans performing at the 90th percentile scoring 78%.<sup>24</sup> The effect size was 0.165 for the CoE clinical sample versus the CWF sample, and 0.089 for the CoE clinical subsample versus the community comparison sample.

The PCSSW Care Comprehensiveness and Coordination scale showed significantly ( $p < .001$ ) higher levels of satisfaction with care in the CoE clinical subsample than in the community comparison sample. The effect size for this comparison was 0.449.

### Primary Care Relationship with the CoE

Table 6 shows how the primary care relationship with the CoE affects the quality of care in the CoE clinical sample. Approximately 48% of women in the CoE clinical sample reported that the CoE was their only source of primary health care, and 53% had used the CoE for their care for 2 years or longer.

**Table 2. ACCESS AND UTILIZATION OF HEALTH CARE IN THE CoE CLINICAL SAMPLE AND THE CWF SAMPLE**

	<i>CoE Clinical Sample (n = 3,111)</i>		<i>CWF Sample (n = 2,075)</i>	
	<i>Mean or Proportion</i>	<i>95% CI</i>	<i>Mean or Proportion</i>	<i>95% CI</i>
<b>Health insurance type</b>				
Medicaid	0.148	(0.14, 0.15)	0.111	(0.10, 0.13)
Medicare	0.134	(0.13, 0.14)	0.164	(0.15, 0.18)
Private	0.672	(0.66, 0.68)	0.531	(0.51, 0.55)
Other	0.007	(0.01, 0.01)	0.059	(0.05, 0.07)
Uninsured	0.039	(0.04, 0.04)	0.135	(0.12, 0.15)
<b>Insured women in managed care</b>				
Respondents with lack or lapse of health insurance in last 12 months	0.081	(0.08, 0.09)	0.080	(0.07, 0.09)
Mean number of visits in last year	8.65	(8.33, 8.96)	6.23	(5.79, 6.66)
Hospitalized in last year (other than childbirth)	0.155	(0.15, 0.16)	0.097	(0.08, 0.11)
<b>Type of regular provider</b>				
Generalist	0.538	(0.52, 0.56)	0.727	(0.70, .75)
ObGyn Only	0.186	(0.17, 0.20)	0.059	(0.05, .07)
Other	0.107	(0.10, 0.12)	0.052	(0.04, .06)
No regular provider	0.169	(0.16, 0.18)	0.162	(0.14, 0.18)
Gender of regular provider (female)	0.918	(0.91, 0.92)	0.238	(0.22, 0.26)

CI = confidence interval.

**Table 3. BENCHMARK COMPARISONS OF SCREENING AND COUNSELING SERVICES: CoE CLINICAL SAMPLE AND CWF SAMPLE (ADJUSTED MEANS\* AND 95% CONFIDENCE INTERVALS)**

	<i>CoE Clinical Sample (n = 3,111)</i>	<i>CWF Sample† (n = 2,075)</i>	<i>Effect Size‡</i>
<b>Screening</b>			
Routine physical exam, past 3 years	0.929 (0.910,0.947)	0.856 (0.838,0.874)§	0.173
Papanicolaou test, past 3 years	0.952 (0.937,0.967)	0.886 (0.870,0.903)§	0.172
Physical breast exam, past year	0.892 (0.871,0.914)	0.754 (0.732,0.775)§	0.278
Mammogram, ages 50+, past year	0.917 (0.893,0.940)	0.803 (0.762,0.843)§	0.200
Cholesterol test, past 5 years	0.881 (0.859,0.902)	0.832 (0.811, 0.855)	0.100
Colon cancer screening, ages 50+, past 5 years	0.603 (0.530,0.677)	0.432 (0.369,0.495)‡	0.193
<b>Counseling (past 12 months)</b>			
Smoking (for current smokers)	0.870 (0.834,0.905)	0.748 (0.697,0.798)§	0.210
Diet and weight	0.534 (0.487,0.580)	0.506 (0.482, 0.530)	
Exercise	0.612 (0.574,0.650)	0.540 (0.516, 0.564)	0.131
Importance of calcium intake	0.476 (0.430,0.522)	0.450 (0.424, 0.475)	0.045
Hormone replacement therapy, ages 40+	0.464 (0.410,0.518)	0.414 (0.363, 0.464)	0.058
Alcohol and drugs	0.312 (0.286,0.338)	0.231 (0.210,0.251)§	0.171
Domestic violence	0.165 (0.139,0.191)	0.0735 (0.061,0.086)§	0.323
Sexually transmitted disease	0.189 (0.158,0.221)	0.111 (0.095,0.128)§	0.204

\*Means adjusted for region, age, education, perceived health status, and managed care enrollment.

†CWF sample includes only women with a health care visit in the last year.

‡Effect size calculated as Cohen's d: difference between means/SD of CWF.

§  $p < .001$ , ||  $p < .01$ .

**Table 4. BENCHMARK COMPARISONS OF SCREENING AND COUNSELING SERVICES: CoE CLINICAL SUBSAMPLE AND COMMUNITY COMPARISON SAMPLE (ADJUSTED MEANS\* AND 95% CONFIDENCE INTERVALS)**

	CoE Clinical Subsample† (n = 618)	Community Sample‡ (n = 611)	Effect Size§
<b>Screening</b>			
Routine physical exam, past 3 years	0.900 (0.876, 0.924)	0.891 (0.866, 0.917)	0.028
Papanicolaou test, past 3 years	0.965 (0.950, 0.980)	0.943 (0.924, 0.961)¶	0.097
Physical breast exam, past year	0.921 (0.900, 0.943)	0.837 (0.807, 0.867)	0.223
Mammogram, ages 50+, past year	0.900 (0.847, 0.953)	0.740 (0.657, 0.822)	0.232
Cholesterol test, past 5 years	0.870 (0.840, 0.901)	0.895 (0.87, 0.969)	0.077
Colon cancer screening, ages 50+, past 5 years	0.684 (0.591, 0.777)	0.587 (0.498, 0.675)¶	0.133
<b>Counseling (past 12 months)</b>			
Smoking (for current smokers)	0.855 (0.774, 0.935)	0.754 (0.667, 0.841)	0.211
Diet and weight	0.449 (0.409, 0.489)	0.449 (0.409, 0.489)	0.001
Exercise	0.540 (0.499, 0.581)	0.573 (0.533, 0.613)	0.066
Importance of calcium intake	0.460 (0.418, 0.501)	0.485 (0.444, 0.526)	0.051
Hormone replacement therapy, ages 40+	0.563 (0.494, 0.632)	0.469 (0.411, 0.526)¶	0.163
Alcohol and drugs	0.297 (0.233, 0.306)	0.152 (0.123, 0.181)	0.326
Domestic violence	0.180 (0.148, 0.212)	0.0904 (0.067, 0.113)	0.314
Sexually transmitted disease	0.128 (0.097, 0.160)	0.0577 (0.399, 0.076)	0.310

\*Means adjusted for community, age, education, perceived health status, and managed care enrollment.

†Patients surveyed in three CoEs for which community comparison survey was conducted.

‡Community comparison surveys in communities served by three CoEs.

§Effect size calculated as Cohen's *d*: difference between mean/SD of community sample.

|| *t* test: || *p* < .001, ¶ *p* < .05.

Women who use the CoE for first contact care (their only regular place of care is the CoE) were significantly more likely to be highly satisfied with their care than women who used CoE services in combination with another place of care or who did not have a regular place of care. This result was found for both the

**Table 5. BENCHMARK COMPARISONS FOR PATIENT SATISFACTION (ADJUSTED MEANS AND 95% CONFIDENCE INTERVALS)**

	CoE Clinical Sample (n = 1,876)	CAHPS Sample (n = 71,438)	Effect Size	CoE Clinical Subsample (n = 382)	Community Sample (n = 402)	Effect Size
CAHPS Score (%8–10)	0.807 (0.775, 0.838)	0.728 (0.721, 0.734)*†	0.088	0.860 (0.825, 0.896)	0.789 (0.767, 0.831)‡§	0.166
PCSSW Scale	n/a	n/a		0.297 (0.260, 0.334)	0.140 (0.113, 0.168)*¶	0.449

\**t* test for significance of beta for CoE is significant *p* < .001.

†This comparison uses the sample of women who completed 1999 CAHPS for commercial managed care plans and women in the CoE clinical sample who are enrolled in managed care plans and are not insured by Medicaid. Variables adjusted for are region (eight regions used by NCQA + Puerto Rico), age, education, and perceived health status.

‡*t* for significance of beta for CoE is significant at *p* < .05.

§This comparison uses women in the community comparison sample and the corresponding CoE clinical subsample who are enrolled in managed care and are not insured by Medicaid. Variables adjusted for are community, age, education, and perceived health status.

||The PCSSW Care Comprehensiveness and Coordination scale is scored as a dichotomy: women reporting scores in the top 20% (highest satisfaction) are compared with all others.

¶This comparison uses all women in the community comparison sample and all women in the CoE clinical subsample. Variables adjusted for are community, age, education, perceived health status, and managed care enrollment.

**Table 6.** ASSOCIATION OF THE PRIMARY CARE RELATIONSHIP WITH THE CoE AND QUALITY OF CARE IN THE CoE CLINICAL SAMPLE (N = 3,111)

	<i>First Contact</i> (CoE is regular provider)		<i>Longitudinality</i> (CoE for >2 years)	
	<i>Odds Ratio*</i>	<i>95% CI</i>	<i>Odds Ratio*</i>	<i>95% CI</i>
High preventive care†	1.00	0.86, 1.16	1.00	0.87, 1.16
High counseling services‡	1.08	0.95, 1.22	1.17	1.02, 1.35
CAHPS Score (%8–10)§	1.15	1.02, 1.31	1.39	1.17, 1.65
PCSSW Scale	1.15	1.00, 1.32	1.13	0.90, 1.43

\*GEE models adjusted for age, education, perceived health status, managed care enrollment, and type of regular provider at the CoE (regular provide is ob/gyn; regular provider is other health professional; no regular provider at CoE).

†Received all of age-appropriate clinical preventive services assessed.

‡Received counseling on more than 50% of age-appropriate topics during the past 12 months.

§Rating of “8” or higher on CAHPS satisfaction score.

||The PCSSW Care Comprehensiveness and Coordinate scale is scored as a dichotomy: women reporting scores in the top 20% (highest satisfaction) are compared with all others.

global CAHPS item (odds ratio [OR] = 1.15) and PCSSW scale (OR = 1.15). Women with longer longitudinal relationships with their providers (length of time as a patient at the CoE of more than 2 years) were more likely to receive a high number of counseling services (OR = 1.17) and to report higher satisfaction (OR = 1.39) on the CAHPS item.

## DISCUSSION

These findings provide the first evidence of the quality of care in the DHHS-designated CoEs compared with national and local community benchmark samples. Because this study relied on self-report data, the definition of quality of care focused on satisfaction with care received and with receipt of clinical preventive services—including screening services and counseling on specific health-related topics—that are recommended in guidelines or by experts on women’s health care. Compared with three independent samples (CWF, CAHPS, and the local community survey), women served in the CoEs generally receive more clinical preventive services and experience higher levels of satisfaction with care than women served elsewhere. In addition, among CoE patients, there is some evidence that women with stronger primary care relationships with the CoE (as evidenced by their use of the CoE for first contact and their longitudinal relationship with the CoE) are more satisfied and are more likely to receive a full range of age-appropriate counseling services.

Specifically, in adjusted comparisons with a nationally representative sample of women, women served in CoEs were significantly more likely than women in national and community comparison samples to receive all of the age-appropriate screening services measured: routine physical examination, Pap test, physical breast examination, mammogram, cholesterol test, and colon cancer screening. With regard to counseling, women served in CoEs were more likely to receive counseling on five of eight topics measured: smoking cessation, exercise, alcohol or drugs, domestic violence, and sexually transmitted disease. In comparisons with local community samples for three of the CoEs, women served in CoEs were significantly more likely to receive Pap tests, physical breast examination, mammograms, colon cancer screening, and

counseling on hormone replacement therapy, alcohol and drugs, domestic violence, and sexually transmitted disease. No CoE effect was found for counseling on diet and weight or the importance of calcium intake. Importantly, the three counseling topics that are more likely to be addressed in CoEs in both the national and local benchmark comparisons (alcohol or drugs, domestic violence, and sexually transmitted disease) are the most sensitive counseling topics in the measured set; this suggests that CoEs may provide an environment more conducive to addressing sensitive topics in women's health.

The differences observed between the CoE and comparison samples for many of the screening and counseling services range from approximately 6% to 12%. For some services such as alcohol or drugs, domestic violence, and sexually transmitted disease, the services provided in the CoEs represent a more than 30% increase in the proportion observed in the CWF. Effect size statistics have been used as an indicator of importance, taking into account the variability of the outcome (in the benchmark sample). The differences between the CoE clinical sample and the CWF samples can be considered to range from small (e.g., routine physical examination, Pap test, colon cancer screening) to moderate (e.g., mammogram and counseling on smoking, domestic violence, alcohol and drugs, and sexually transmitted disease) when contrasted with effects obtained in clinical studies for common primary care topics such as increased control of high blood pressure and glycemia on quality of life.<sup>33,34</sup> From another standpoint, reliable cutpoints for important versus trivial effects are elusive and depend upon the potential yield in terms of disease prevented or quality of life improved.<sup>35</sup> A recent NCQA report<sup>29</sup> estimated that a 1% increase in breast cancer screening observed in the Health Plan Employer Data and Information Set (HEDIS) in 1999 to 2000 applied to over 3.5 million eligible women (age 50 years and over) would correspond to 130 lives saved. This is based on model assumptions that regular screening of 10,000 women would avert 37 deaths before age 80.<sup>36</sup> In the CoEs, the difference in routine mammography screening over the CWF benchmark was 11%. If this were applied to the 36% of women over age 50 served by the CoE program (estimated by DHHS Office on Women's Health staff to be approximately 450,000 for all ages), 17,820 additional women would be regularly screened. Applying the HEDIS calculations, this figure would translate to 66 additional lives saved before age 80 if the alternative were the rates for mammography reported in the CWF sample.

The findings with regard to patient satisfaction are consistent with the overall findings of more preventive services, including both global and women-specific measures of satisfaction. In the CAHPS comparisons, based upon women enrolled in managed care plans, women served in CoEs reported significantly higher satisfaction with all health care received in the past 12 months, though the effect sizes for these differences in overall satisfaction appear small. In the local community comparison, women served in CoEs reported higher satisfaction with all care received in the past 12 months and with care comprehensiveness and coordination, the latter assessed in a new measure targeting women's perceptions of their health care. Care comprehensiveness and coordination is a key area of emphasis in the CoE program, and interestingly produced the largest effect obtained in the series of CoE comparisons. The results of this study provide evidence that the recently developed PCSSW instrument is highly sensitive to quality of women's health care and may be more sensitive to care in the CoEs than a generic measure such as the CAHPS item.

Finally, the findings show some evidence of a "dose response" with respect to care received in a CoE. That is, the more women depend on a CoE for care (based upon primary care concepts of first contact care and longitudinality), the higher the quality of care they receive. In particular, having been

a patient in a CoE for more than 2 years is associated with receiving more counseling services and reporting higher satisfaction with care.

These promising results suggest that a specific type of women's health center (as embodied by the CoEs) may provide a higher standard of preventive care for adult women and may be associated with higher levels of patient satisfaction than standard practice. This study provides the most systematic evidence available on the care provided in women's health centers because it includes more centers and a larger sample of women than in previous single-site studies, and it includes measures of a wider range of dependent variables than previous studies.<sup>14,15</sup> A strength of this study is that it used several independent benchmark sources yet found consistently positive effects of being served in a CoE, including a higher number of recommended screening and counseling services delivered to women and higher satisfaction with care. This evidence strongly suggests that the CoE programs delivered better preventive care to their patients than what may have been otherwise accessed in the community at large.

Importantly, these analyses adjusted for key variables (region, age, education, perceived health status, and managed care enrollment) that may have differed between the CoE and comparison samples and often are associated with preventive care received or with satisfaction. Still, a main methodological challenge in this study is the likelihood of a "selection effect" in women's health centers. In case studies conducted as part of the 1994 National Survey of Women's Health Centers, patient focus groups in four primary care centers provided qualitative information about why women selected the centers and their perceptions of how quality of care compared with other sites. The desire to be treated by female physicians in a women-friendly environment was a key motivator for patients, and patients uniformly reported that care provided in the women's health centers was superior to that in other sites they had experienced.<sup>37</sup> Two recent studies of care provided in women's health centers found that women served in centers are more likely to prefer female physicians compared with women in general internal medicine practices<sup>14,15</sup> and women physicians tend to provide more clinical preventive services to women compared with male physicians.<sup>38</sup> Thus, some effects observed in this study could have arisen because highly motivated patients sought out women-focused care and female physicians in the CoEs. Although our study controlled for other variables associated with selection of a women's health center, we were unable to control for patients' preferences.

Another rival hypothesis has to do with quality of care in academic health centers.<sup>39</sup> All of the CoEs are located in academic health centers where commitment to women's health care is strong. Because no benchmark data for women's health care in academic health centers are available, it is not known whether the quality of women's primary care typically is better in academic health centers as compared with other settings. An additional limitation comes from the fact that the original benchmark and CoE surveys were conducted at different points in time. The CWF and CAHPS data were collected approximately 2 to 3 years earlier than the CoE survey data. Gradual increases over time in screening and other preventive care for women in the community may have occurred, which may have distorted the differences observed between the CoE and the benchmark data. However, our community comparison sample for three CoEs was conducted at the same time as the CoE clinical survey, and concurrent community comparisons showed a similar pattern of results to that found in the comparison of the CoE clinical sample with the CWF sample.

It is possible that one reason for the findings that women receive more recommended clinical preventive services in CoEs compared with standard care is that women in CoEs are almost always treated by female physicians: 92% of women in the CoE sample reported that their regular physician at the

CoE was female. Prior research generally has shown that women seeing female primary care physicians receive more clinical preventive services—particularly women-specific services, such as breast and cervical cancer screening—than women seeing male primary care physicians.<sup>38,40,41</sup> Seeing female physicians would not necessarily account for our findings with respect to satisfaction, however: one study of patients in health maintenance organizations found that female patients who chose their female physicians report lower satisfaction with care than other female patients.<sup>42</sup> In this study, the CoE “intervention” is confounded with female physician gender: in these analyses, we cannot disentangle the effects of female physician gender from the effects of the overall CoE clinical center with its features of comprehensive services, multi-disciplinary staff, and so forth. Future studies should address how different components of women’s health centers affect the quality of care provided.

Despite these limitations, the results reported here support the CoE model of primary care for women. A key policy question is whether resources should be devoted to extending the CoE model of care to other institutions or to encouraging the growth of women’s health centers generally. Although the results here are promising, the research to date cannot answer questions about which specific attributes of the CoEs account for the positive findings or whether results would be the same for women’s health centers established in community hospitals or in nonhospital settings. Further research on the quality of care in primary care women’s health centers clearly is called for, especially given these promising results from a national evaluation of the clinical centers in 15 CoEs.

### ACKNOWLEDGMENTS

This study was supported by contracts from the DHHS Office on Women’s Health (contract no. 00T00215901D) and a grant from the Agency for Healthcare Research and Quality (R01 HS10237-01A1). The authors gratefully acknowledge the contributions of Kathleen Dziak, BA and Shellie Ellis, MA at Wake Forest University School of Medicine for their assistance as project managers; Douglas Levine, PhD for his assistance in sample selection; Katherine Lind, PhD at the University of South Carolina Survey Research Laboratory for her assistance with the telephone survey; Steve Heeringa, PhD at the University of Michigan for his advice on complex survey analysis; Susan Clark, MA and Eileen Newman, MS, RD of the DHHS Office on Women’s Health for their support of this project; and the staff and directors of the 15 National Centers of Excellence in Women’s Health participating in this study.

### REFERENCES

1. Institute of Medicine. Defining primary care: an interim report. Washington, DC: National Academy Press; 1994.
2. Office on Women’s Health. National Centers of Excellence in Women’s Health Report Card. Washington, DC: U.S. Department of Health and Human Services; 2000.
3. Clancy CM, Massion CT. American women’s health care: a patchwork quilt with gaps. *JAMA* 1992;268:1918.
4. Weisman CS, Henderson JT, Schifrin E, et al. Gender and patient satisfaction in managed care plans: analysis of the 1999 HEDIS/CAHPS 2.0H Adult Survey. *Women’s Health Issues* 2001;11:401–415.
5. Bartman BA, Weiss KB. Women’s primary care in the United States: a study of practice variation among physician specialties. *J Women’s Health* 1993;2:261–268.
6. Henderson JT, Weisman CS. Are two doctors better than one? Women’s physician use and appropriate care. *Women’s Health Issues* 2002;12:138–149.
7. Weisman CS, Cassard SD, Plichta SB. Types of physicians used by women for

- regular health care: implications for services received. *J Women's Health* 1995;4:407–416.
8. Ruzek SB. *The women's health movement: feminist alternatives to medical control*. New York: Praeger; 1978.
  9. Looker P. Women's health centers: history and evolution. *Women's Health Issues* 1993;3:95–100.
  10. American Hospital Association. *American Hospital Association Hospital Statistics, 1993–94 edition*. Chicago: American Hospital Association; 1993.
  11. Weisman CS, Curbow B, Khoury AJ. The National Survey of Women's Health Centers: current models of women-centered care. *Women's Health Issues* 1995;5:103–117.
  12. Milliken N, Freund K, Pregler J, et al. Academic models of clinical care for women: the National Centers of Excellence in Women's Health. *J Women's Health Gender-Based Med* 2001;10:627–636.
  13. Squires GL. National Centers of Excellence in Women's Health: Are the clinical care centers models for effective women's health care delivery? Invited paper presented at the Enhancing Outcomes in Women's Health conference of the American Psychological Association, Washington, DC, Feb. 22, 2002.
  14. Harpole LH, Mort EA, Freund KM, et al. A comparison of the preventive health care provided by women's health centers and general internal medicine practices. *J Gen Intern Med* 2000;15:1–7.
  15. Phelan EA, Burke W, Deyo RA, et al. Delivery of primary care to women: Do women's health centers do it better? *J Gen Intern Med* 2000;15:8–15.
  16. U.S. Preventive Services Task Force. *Guide to clinical preventive services, 2nd ed*. Baltimore: Williams and Wilkins; 1996.
  17. American College of Obstetricians and Gynecologists. *Guidelines for women's health care, 2nd ed*. Washington, DC: ACOG; 2002.
  18. Mosca L, Grundy SM, Judelson D, et al. *Guide to preventive cardiology for women*. *Circulation* 1999;99:2480–2484.
  19. Hall JA, Roter DL. Medical communication and gender: a summary of research. *J Gender-Specific Med* 1998;1:39.
  20. Anderson RT, Barbara AM, Weisman C, et al. A qualitative analysis of women's satisfaction with primary care from a panel of focus groups in the national centers of excellence in women's health. *J Women's Health Gender-based Med* 2001;10:637–647.
  21. Scholle SH, Weisman CS, Anderson RT, et al. Women's satisfaction with primary care: a new measurement effort from the PHS National Centers of Excellence in Women's Health. *Women's Health Issues* 2000;10:1.
  22. Falik MM, Collins KS. Women's voices, women's experiences—taking the time to listen. *Women's Health Issues* 2001;11:143–147.
  23. National Committee for Quality Assurance. *HEDIS 1999 Volume 3: HEDIS protocol for administering CAHPS 2.0H survey*. Washington, DC: NCQA; 1998.
  24. National Committee for Quality Assurance. *The state of managed care quality, 2000*. Washington, DC: NCQA; 2000.
  25. Starfield B. *Longitudinality and managed care: primary care concepts, evaluation, and policy*. New York: Oxford University Press; 1992 41–55.
  26. StataCorp. *Stata statistical software: release 7.0*. College Station, TX: Stata Corporation; 2001.
  27. Cody RP, Smith JK. *Applied statistics and the SAS programming language, 4th ed*. Upper Saddle River, NJ: Prentice Hall; 1997.
  28. Cohen J. *Statistical power analysis for the behavioral sciences, 2nd ed*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1988.
  29. NCQA. *The state of managed care quality report*. Washington, DC: National Committee for Quality Assurance; 2001.
  30. National Women's Law Center, University of Pennsylvania, and Oregon Health and Science University. *Making the grade on women's health: a national and state-by-state report card*. Washington, DC: National Women's Law Center; 2001.
  31. North Carolina Program for Women's Health Research. *2001 North Carolina women's health report card*. Chapel Hill, NC: University of North Carolina, Chapel Hill; 2001.
  32. Norton EC, Bieler GS, Ennett ST, et al. Analysis of prevention program effectiveness

- with clustered data using generalized estimating equations. *J Consult Clin Psychol* 1996;64:919–926.
33. Croog SH, Levine S, Testa M, et al. The effects of antihypertensive therapy on the quality of life. *N Engl J Med* 1986;314:1657–1664.
  34. Testa M, Simonson DC. Health economic benefits and improved quality of life during improved glycemic control in patients with type 2 diabetes mellitus. *JAMA* 1998;280:1490–1496.
  35. Rosenthal R, Rubin D. A note on percent variance explained as a measure of the importance of effects. *J Appl Soc Psychol* 1979;5:395–396.
  36. Salzmann P, Kerlikowske K, Phillips K. Cost-effectiveness of extending screening mammography guidelines to include women 40 to 49 years of age. *Ann Intern Med* 1997;127:955–965.
  37. Weisman CS, Curbow B, Khoury AJ. New York: The Commonwealth Fund; 1997.
  38. Henderson JT, Weisman CS. Physician gender effects on preventive screening and counseling: an analysis of male and female patients' health care experiences. *Medical Care* 2001;39:1281–1292.
  39. Ayanian J, Weissman JS. Teaching hospitals and quality of care: A review of the literature. *Milbank Quarterly* 2002;80:569–593.
  40. Lurie N, Slater J, McGover P, et al. Preventive care for women: Does the sex of the physician matter? *N Engl J Med* 1993;329:478–482.
  41. Franks P, Clancy CM. Physician gender bias in clinical decision making: screening for cancer in primary care. *Medical Care* 1993;31:213–218.
  42. Schmittiel J, Grumbach K, Selby JV, Quesenberry CP. Effect of physician and patient gender concordance on patient satisfaction and preventive care practices. *J Gen Intern Med* 2000;15:761–769.