

BRIEF REPORT: Quality of Ambulatory Care for Women and Men in the Veterans Affairs Health Care System

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BACKGROUND: Gender differences in inpatient quality of care are well known. However, whether men and women receive equivalent ambulatory care is less well understood.

OBJECTIVE: To study gender differences in quality of care for patients receiving primary care in the Veterans Affairs (VA) Health Care System.

DESIGN: Cross-sectional samples of VA enrollees during fiscal years 1999 to 2000.

PARTICIPANTS: Samples of 6,442 to 86,405 men and women treated at VA facilities for whom at least 1 of 9 quality measures was available.

MEASUREMENTS: Appropriate general preventive services (pneumococcal vaccination, influenza vaccination, colorectal cancer screening), and specific services for diabetes (annual hemoglobin A1c [HbA1c] testing, good glycemic control, annual diabetic eye exam), hypertension (good blood pressure control), or prior myocardial infarction (use of β -blockers or aspirin).

RESULTS: In adjusted analyses, there were no substantial gender differences in rates of appropriate care. For women compared with men, the adjusted relative risk for appropriate care ranged from 0.96 for blood pressure control (95% confidence interval: 0.93 to 0.99; $P=.02$) to 1.05 for HbA1c $\leq 8.0\%$ (95% confidence interval: 1.03 to 1.07; $P<.01$). Analyses stratified by age demonstrated equivalent care between men and women in 9 of the 14 subgroups evaluated.

CONCLUSIONS: In this large national health care system that predominantly serves men, the quality of ambulatory care is equivalent for women and men on numerous measures.

KEY WORDS: gender; quality; veterans; prevention; diabetes mellitus.
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Men and women do not always receive equivalent care,^{1,2} and these differences may be because of nonclinical factors. Women often receive poorer care after admission for congestive heart,¹ coronary heart disease,³⁻⁵ and other common medical conditions.² In contrast, gender differences in the quality of ambulatory medical care are largely unexplored, although limited data suggest that disparities may exist in this setting as well.⁶

The Department of Veterans Affairs (VA) runs the largest integrated health care system in the United States. Although men make up a large majority of veterans who receive care in

the VA, women now comprise nearly 10% of the 4 million users and are a rapidly rising group. Given the rising numbers of women in military service in recent decades, the number of women seeking care in the VA is expected to grow. While recent data suggest dramatic improvement in quality of care for veterans,⁷ it is unclear whether men and women have shared equally in this advancement. Using common indicators, we sought to determine whether gender differences exist in the quality of ambulatory care in this large, national health care system.

METHODS

Design

We used data from VA External Peer Review Program⁸ to assess quality of care during fiscal years 1999 to 2000 (October 1, 1998 to September 30, 2000). External Peer Review Program data are derived from cross-sectional samples of medical records reviewed by trained abstractors with high interrater reliability scores (κ 0.90)⁷ and oversight both from the Congressional committees of VA and the Government Accounting Office.⁹ The study protocol was approved by the Institutional Review Boards of the Boston VA Health Care System and Brigham and Women's Hospital.

Patients with 2 years of continuous enrollment in the VA and at least 1 ambulatory visit in the previous 12 months were eligible for sampling. A random sample of all patients within each of the 22 regional networks was obtained annually in adequate numbers to ensure reproducible precision for estimated rates in each network.¹⁰ In addition, random samples of patients with prevalent chronic diseases (e.g., diabetes, ischemic heart disease, and chronic obstructive pulmonary disease) were selected in each network, and women were oversampled.

Quality Indicators

We studied 9 quality measures that are equally appropriate for women and men, including 3 preventive measures (vaccinations and cancer screening tests) and 6 chronic disease management measures (e.g., annual retinal exams in diabetics) (Appendix, available online). These indicators were developed by the VA and are similar to measures developed by the National Committee for Quality Assurance to assess health plans in the Health Plan Employer Data and Information Set

The authors have no conflicts of interest to declare.

The results were presented at the 2004 Society of General Internal Medicine annual conference and the annual meeting of VA Health Services Research and Development.

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(HEDIS).¹¹ Each of the quality measures reflects recommendations made in national guidelines.¹²⁻¹⁴

Statistical Analysis

We measured the association between gender and individual quality measures using prevalence ratios and χ^2 tests. This study had a statistical power of greater than 95% power to detect a 3% difference in adherence rates in each of the quality markers, except for patients with prior myocardial infarction (MI) (aspirin and β -blocker use), where this study had 80% power to detect a 6% difference in rates.

Subsequently, using multivariate logistic regression and generalized estimating equations to adjust for age and institutional characteristics (number of housestaff, number of hospital beds, and region of the country), we assessed whether gender was independently associated with each quality measure and converted odds ratios (ORs) to relative risks using standard methods.¹⁵ We tested for interactions of gender with age and hospital characteristics as predictors of adherence to quality indicators. Because we were aware a priori that women were younger and that age was related to adherence to quality indicators, we chose to stratify our multivariate analyses by age (<65 vs \geq 65 years), except for post-MI use of aspirin and β -blockers because fewer than 100 women were eligible for these measures. All analyses were performed using Stata 7.0 (College Station, TX).

RESULTS

The sample sizes for the 9 quality measures ranged from 6,695 post-MI patients to 86,405 patients eligible for pneumococcal vaccination (see Appendix). Women represented between 13% and 23% of the samples (Appendix) for most of the quality measures, except for post-MI patients (1.4%). Women were younger than men. There were small although statistically significant differences in facility and geographic characteristics for men and women sampled for these quality measures (Table 1).

Adherence to quality indicators ranged from 47% for blood pressure control to 98% for aspirin among patients with a prior MI (Table 2). In unadjusted analyses, women were less likely to receive 5 of the 9 appropriate services and more likely to receive the other 4. Adjusting for differences in age and hospital characteristics, we found that women and men received comparable care, with relative risks for women compared with

men ranging from 0.96 for adequate blood pressure control to 1.05 for good glycemic control (Table 2). While some of the differences between men and women were statistically significant, the magnitude and differences direction of these differences were small and inconsistent.

In additional multivariable analyses stratified by age, men and women received comparable care in nearly all subgroups (Fig. 1). Among the 14 subgroups, women had higher rates of appropriate care for 7 measures, while men had higher rates for the other 7. The odds ratios (women compared with men) for the subgroups ranged from 0.78 (pneumococcal vaccination among those less than 65 years old) to 1.13 (hemoglobin A1c (HbA1c) control among those younger than 65 years old). Differences in 5 of these 14 subgroup analyses were statistically significant. Among those younger than 65 years of age, women were more likely to receive appropriate HbA1c testing (OR 1.13, 95% confidence interval 1.03 to 1.25) and adequate hypertension control (OR 1.09, 95% confidence interval 1.00 to 1.18) but less likely to receive a pneumococcal vaccine (OR 0.78, 95% confidence interval 0.73 to 0.83). Among older patients, women were less likely to receive adequate hypertension control (OR 0.82, 95% confidence interval 0.75 to 0.90) and pneumococcal vaccination (OR 0.92, 95% confidence interval 0.86 to 0.99).

DISCUSSION

Among patients treated in the VA health care system, we found remarkably similar quality of ambulatory care for women and men for both preventive services and chronic disease management. Quality of care was high for most services, but even in situations where care was less than optimal (e.g., blood pressure management), men and women received similar care.

Although gender differences in the quality of ambulatory care are largely unexplored, prior studies suggest that women may receive lower quality of care in these settings. Women receive low rates of secondary cardiac prevention,¹⁶ although few studies have performed direct comparisons with men. Among known gender differences in the quality of ambulatory care, women with coronary heart disease have lower rates of cardiac referral^{17,18} after an admission for an MI and may receive lower rates of appropriate diabetes care¹⁹ than men. One recent evaluation of 10 commercial and 9 Medicare health plans found that women were less likely to receive β -blockers after an MI and that women receive lower rates of diabetes preventive measures.⁶ Herlholz et al.²⁰ similarly found lower rates of critical cardiovascular drug use among women discharged with an acute MI. Schneider et al.²¹ found no variation in HEDIS measures by sex among Medicare managed care patients.

Equal care for men and women should be interpreted in the context of significant gains in quality that the VA has achieved over the past 8 years.^{7,22,23} In the middle of the 1990s, the VA undertook a major reengineering program to improve quality by decentralizing clinical management to 22 regional networks, instituting performance measurement programs, and creating a data collection system to monitor quality.⁷ Further, in an effort to improve care to women, VA dedicated special primary care clinics for women only. Over half of VA hospitals have specialized Women's Health Clinics, although a majority of women enrollees receive most or nearly all their care in general medical clinics.²⁴ Veterans Affairs

Table 1. Baseline Characteristics of Men and Women in the EPRP Sample*

Characteristics	Women, % (n)	Men, % (n)	P Value
Age (y)	59.9	66.4	<.001
Region			<.001
Northeast	25 (2,000)	21 (15,006)	
Midwest	25 (1,934)	33 (23,450)	
South	26 (2,063)	27 (19,335)	
West	24 (1,847)	20 (14,244)	
Hospital size (no. of beds)	309	307	.85
Urban hospital % (n)	38 (9,027)	34 (72,879)	<.001
High technology % (n)	32 (7,615)	33 (69,429)	<.001
Academic hospital % (n)	40 (10,114)	42 (69,445)	<.001

*For those eligible for the pneumococcal vaccine.
EPRP, External Peer Review Program.

Table 2. Percentage of Enrollees Receiving Appropriate Care by Gender with Prevalence Ratios

Quality Indicator	Women, %	Men, %	Unadjusted Relative Risk	P Value	Adjusted Relative Risk (95% CI)	P Value
Pneumococcal vaccination	74.0	79.7	0.93	<.01	0.98 (0.97–0.99)	<.01
Influenza vaccination	73.4	76.5	0.96	<.01	0.99 (0.97–1.00)	.03
Colorectal cancer screening	68.9	69.9	0.99	.03	0.99 (0.97–1.00)	.10
Diabetic eye exam screen	67.0	68.6	0.98	.01	0.98 (0.96–1.00)	.10
Annual HbA1c	94.7	94.3	1.01	.30	1.00 (0.99–1.01)	.71
HbA1c <8.0 %	61.1	62.0	0.99	.20	1.05 (1.03–1.07)	<.01
Aspirin after MI	97.8	97.3	1.01	.74	1.00 (0.96–1.02)	.72
β -blocker after MI	95.7	95.0	1.01	.78	1.01 (0.95–1.03)	.75
Blood pressure \leq 140/90 mmHg	48.0	47.4	1.01	.47	0.96 (0.93–0.99)	.02

MI, myocardial infarction; HbA1c, hemoglobin A1c; CI, confidence interval.

Adjusted for age, region of country, hospital size, hospital location (urban vs nonurban), academic status of hospital or clinic.

quality improvement efforts targeted gender-specific measures, which led to VA outperforming the private sector with higher rates of both mammography and cervical cancer screening.⁷ It may be that broad-based quality improvement efforts may reduce variations in care and this may help explain the gender parity in quality of ambulatory care.

Our study has important limitations. First, we were unable to adjust for several potentially important confounders such as socioeconomic status, comorbidities and health status, and utilization rates, all of which could be associated with quality of care. However, female enrollees in the VA are more likely to be poor and unemployed,²⁵ have lower functional status²⁴, and health status²⁶ than male enrollees. Further, adjusted for age, women enrollees have lower rates of VA utilization than their male counterparts.²⁷ Therefore, these factors are likely to bias us toward finding worse care for women. Second, while we found generally high-quality care, there were still areas where men and women both received less than op-

timal care, such as hypertension management. While the quality of hypertension care improved in the VA from 1995 through 2000, and while rates of adequate blood pressure control in the VA are comparable with the private sector,²² these are still areas that require improvement. Finally, because we used process measures to assess quality of care, we could not discern whether women and men have equal outcomes.

In conclusion, we found remarkably similar quality of care for women and men in outpatient preventive services and chronic disease management in the VA. This equal care may be related to the large strides in quality that the VA has achieved in the past decade.

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RR for receiving quality care, women versus men

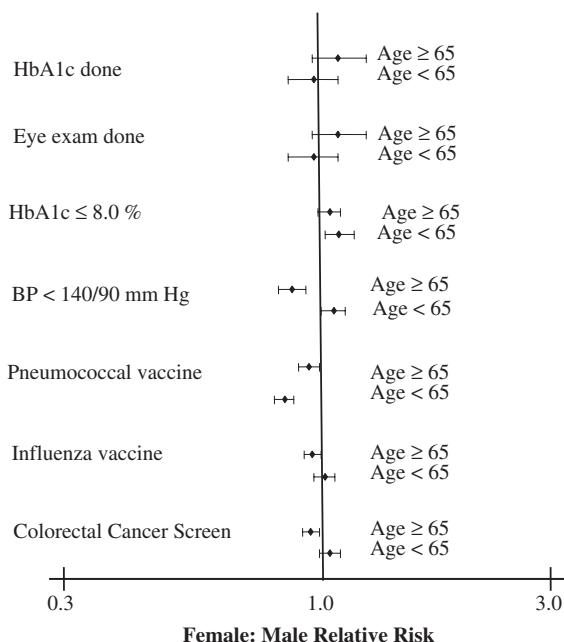


FIGURE 1. Risk ratio with 95% confidence interval (CI) for receiving quality care, stratified by age. Post-myocardial infarction (MI) patients not analyzed in subgroups because of small sample size and lack of interaction by age group.

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Supplementary Material

The following supplementary material is available for this article online:

Appendix. Quality Indicators and Sampling Frame for Men and Women in the EPRP Dataset.