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Preventive Health Care among Older Women in an Academic Primary Care Practice

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Abstract

PURPOSE: To examine use of preventive health services among older women and to assess how age and illness burden influence care patterns.

METHODS: The charts of 299 women aged 80+ and 229 women aged 65-79 who did not have dementia or terminal illness at one academic primary care practice in Boston were reviewed between July and December 2005 to determine receipt of *screening tests* (e.g., mammography), *counseling* on healthy lifestyle (e.g., exercise) and/or geriatric health issues (e.g., incontinence), and *immunizations*. Illness burden was quantified using the Charlson Comorbidity Index (CCI).

RESULTS: Women aged 80+ were more likely than women aged 65-79 to have a CCI of 3+ (24.0% vs. 16.7%) and were less likely to receive all screening tests. However, receipt of mammography (47.8%) and colon cancer screening (51.2%) was still common among women aged 80+ and was not targeted to older women in good health. Women aged 80+ were less likely to be screened for depression (aRR 0.6 [0.5-0.8]), osteoporosis (aRR 0.6 [0.5-0.9]) or counseled about exercise (aRR 0.8 [0.6-0.9]) than younger women but were more likely to receive counseling about falls (aRR 1.9 [1.4-2.6]) and/or incontinence (aRR 1.8 [1.2-2.6]). However notes documenting discussions about mood (28.6%), exercise (40.0%), falls (28.8%) or incontinence (20.8%) were low among all women.

CONCLUSION: In a comprehensive review of preventive health measures for elderly women, many in poor health were screened for cancer. Meanwhile, many older women were not screened for depression or counseled about exercise, falls, or incontinence. There is need to improve delivery of preventive health care to older women.

Keywords

Older women; preventive health; screening

Introduction and Background

Many preventive health measures are available to elderly women, including *screening tests* (e.g., mammography), *immunizations*, and *counseling* about a healthy lifestyle (e.g., exercise) and/or geriatric health syndromes (e.g., incontinence) (Amin et al., 2003; Nicastrì & Fields, 2004). Ideally, older women would receive preventive health measures from which they are most likely to benefit based on their health and life expectancy (Walter & Covinsky, 2001). As a heterogeneous group, women's life expectancy uniformly decreases with age, but can vary from one individual to the next according to illness burden. Therefore, predicted life expectancy is an important determinant when considering which preventive services to provide (Walter & Covinsky, 2001). Experts generally agree that older women need 5 to 10 years of life expectancy to potentially benefit from mammography or colon cancer screening (Fletcher & Elmore, 2003; Walter & Covinsky, 2001). In the case of cervical cancer screening, guidelines

recommend that screening cease for most women by age 65 or 70 (Saslow et al., 2002; Screening for cervical cancer: recommendations and rationale, 2003). Meanwhile, clinicians are encouraged to immunize their older patients with pneumococcal and influenza vaccinations (available from www.Medicare.gov), screen for depression and osteoporosis (U.S. Preventive Services Task Force, 2002; Screening for osteoporosis in postmenopausal women: recommendations and rationale, 2002), discuss exercise and nutrition and counsel their older patients about falls prevention and incontinence among other geriatric syndromes (Christmas & Andersen, 2000; Miller et al., 2000). Limited time during clinic visits, little compensation for counseling, and competing health demands that increase as women age, may make it difficult for clinicians to meet all of these expectations. In addition, older women may receive some preventive health measures from which they are unlikely to benefit (e.g., PAP smears) and not receive others (e.g., flu vaccination) that are likely to be effective in a short time period.

Several studies have examined receipt of individual preventive health measures among older women but none have examined receipt of a wide range of preventive health measures simultaneously in a practice setting (Bynum et al., 2005; Pham et al., 2005; Schonberg et al., 2004; Schonberg et al., 2006a; Walter et al., 2004; Wenger et al., 2003). National studies examining mammography and cervical cancer screening specifically have found poor targeting of these tests to elderly women in good health (Bynum et al., 2005; Schonberg et al., 2004; Walter et al., 2004). National studies have also found that only 60-65% of older US adults receive pneumococcal and/or influenza vaccinations (Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices, 1997; Thompson et al., 2003). Other studies have found that few (28%) older women receive exercise counseling (Schonberg et al., 2006a) or bone density testing (23%) (Neuner et al., 2006), and that identification of older women with depression, incontinence, or at high risk for falls is often neglected by primary care physicians (Chou et al., 2005; Rubenstein et al., 2007; Simon & VonKorff, 1995).

The purpose of this study was to examine receipt of a wide range of preventive health measures among older women at one time in a practice setting to learn if older women receive the preventive health measures from which they are likely to benefit based on their age and health. Although certain preventive health measures may be documented in the medical record more frequently than others, documentation should not vary by age. Therefore, receipt of different preventive health measures was compared between women aged 80 and older and women aged 65-79. The spectrum of services examined reflects the scope and challenges of current primary care practice.

Methods

Patients and Practice Site

This was a retrospective cohort study of older women who received their primary care at a hospital based general internal medicine practice in Boston. The practice consists of approximately 50 faculty internists and over 100 internal medicine residents that provide care to approximately 34,000 patients. Women were eligible for the study if they were aged 65 or older and had seen a primary care clinician at the clinic at least one time in the past year. Patients who had a documented history of dementia or were terminally ill were excluded. Figure 1 displays the sample selection. An initial electronic search performed in May 2005 identified 716 women aged 80 and older and 1,962 women aged 65-79 who had at least one billing record in the practice in the past year. Four hundred women aged 80 and older and 275 women aged 65-79 were randomly identified from these lists since it was anticipated that more women aged 80 and older would meet exclusion criteria and a follow up telephone survey of 100 women from each age group was planned for a second study. After excluding ineligible women, the

final sample consisted of 299 women aged 80 and older and 229 women aged 65-79, representing the patients of 88 physicians.

Data Collection

Four chart abstractors (MS, MY, NB, DP) collected data from the practice's computerized outpatient medical record (OMR) from July to December 2005. OMR contains notes from all office visits, a detailed list of patients' current and past medical problems, lab results, radiology reports, gastroenterology procedure reports, demographics, and a preventive health flow-sheet that tracks information about cancer screening as well as immunizations performed both at the hospital and outside medical centers (Sands et al., 2001).

To determine receipt of *screening tests*, date of patients' last mammogram, PAP smear, bone densitometry, colonoscopy, flexible sigmoidoscopy, and returned fecal occult blood cards were recorded. Chart abstractors reviewed radiology reports, bone densitometry reports, screening sheets, as well as clinic notes up to one year prior to the date of the chart abstraction, to collect these data. Women were defined as having undergone mammography screening if they had a mammogram in the past 2 years and did not have a history of breast cancer. Women were defined as having undergone colon cancer screening if they 1) had a colonoscopy in the past 10 years, 2) had a flexible sigmoidoscopy in the past 5 years, or 3) returned stool cards in the past year and did not have a history of colon cancer. Women were defined as having undergone cervical cancer screening, if they had a PAP smear in the past 3 years and still had a uterus. Finally, women were defined as having been screened for osteoporosis if they ever had a bone densitometry. In addition, women were considered to have been screened for depression if there was any mention of patients' mood in a note in the past year.

To determine receipt of *immunizations*, patients' preventive health sheets and clinic notes up to one year prior to the current date were reviewed to determine whether patients had ever received a pneumococcal vaccination and the date of patients' last influenza vaccination.

To determine receipt of *counseling*, chart abstractors reviewed one year of notes from all primary care clinic visits. Women were considered to have received counseling about exercise if there was any mention of physical activity or recommendations to exercise in the note. Women were considered to have received diet counseling if there was any mention of patient's general diet, nutrition recommendations, or referrals to a nutritionist. Women were considered to have received counseling on falls prevention and/or incontinence if there was any mention of these issues in a note. Broad definitions were used to ensure that counseling rates were comprehensive.

Other preventive health measures considered for this study included screening for hypercholesterolemia, thyroid disease, hypertension, vision and/or hearing loss. However, almost all women in the sample had their cholesterol, thyroid, and blood pressure tested for disease management or diagnostic purposes rather than for screening. Vision and hearing testing were often performed outside the primary care setting and were not consistently documented in the online medical record.

Chart abstractors also recorded patients' race/ethnicity (ascertained from registration information reported by the patient), number of clinic visits, whether or not they spoke English (by noting whether a translator was scheduled for any appointment), insurance (including Medicare, Medicaid, private and Free Care [eligibility based on income and healthcare expenses]), ZIP code, and illness burden using the Charlson Comorbidity Index (CCI). The CCI is a weighted index based on 17 comorbid conditions that has been shown to predict 1-year and 10-year mortality (Charlson et al., 1987). Indices range from 0-35 with higher indices being associated with stepwise increases in cumulative mortality. In the initial validation cohort

of 685 women who received treatment for primary breast cancer, 8% of those with a CCI of 0 died within 10 years, 25-48% of those with a CCI of 1-2 died within 10 years, and 59% of those with an index of 3 or more died within 10 years. We used US census data on median household income for residents aged 65-74 and residents aged 75 and older by ZIP code as a proxy for income. Ten percent of all records were re-abstracted to evaluate reliability of the abstraction process and exact agreement between chart reviewers was 95%. The institutional review board at the hospital approved this study.

Statistical Analyses

Bivariable statistics were used to compare patients' race/ethnicity, insurance coverage, CCI, English language proficiency, proxy for income, and number of clinic visits in the past year by age (65-79 and 80+). Bivariable statistics and multivariable logistic regression were used to compare receipt of preventive health measures including screening tests, immunizations, and counseling among women aged 80 and older and women aged 65 to 79. Models were adjusted for race/ethnicity, number of clinic visits, English language proficiency, insurance, proxy for income, and illness burden since these factors have been shown to be associated with receipt of preventive health in prior studies (Janes et al., 1999; Joffe et al., 2001). In addition to examining the association between age and receipt of preventive health services in adjusted models, we also noted the influence of each of the covariates on receipt of preventive health measures. Finally, since guidelines recommend that mammography and colon cancer screening be targeted to older women by health, we used the Chi-square test for trend to compare receipt of mammography and colon cancer screening by increasing illness burden (CCI=0, 1-2, or 3+) stratified by age (in 5 year intervals). We classified women into CCI categories of 0, 1-2, and 3+ because we wanted women with the greatest illness burden to have life expectancies less than 10 years (defined as greater than a 50% risk of death in 10 years). Due to the high prevalence of many of the outcomes of interest, adjusted odds ratio estimates from the multivariable logistic regression models were converted to relative risk estimates using the approximation algorithm given by Flanders and Rhodes (1987). All statistical analyses were performed using SAS statistical software, version 9.1.

Results

The final sample consisted of 299 women aged 80 and older with a median age of 85 years and 229 women aged 65-79 with a median age of 72 years (Figure 1). The majority of the sample was non-Hispanic white (64.0%), had private or Medicare supplemental insurance (62.3%), and spoke English (79.6%). Women aged 80 and older were similar to women aged 65-79 in regards to race, insurance, median income of ZIP code, and English language proficiency, but were more likely to have a Charlson Comorbidity Index (CCI) of 3 or more and were more likely to have seen a primary care clinician at least 5 times in the past year. (Table 1) Twelve percent of the sample had seen their primary care clinician only one time in the past year (this did not differ by age).

Table 2 presents the prevalence and likelihood of receiving preventive health measures among women aged 80 and older compared to women aged 65-79. Although women aged 80 and older were less likely to receive all screening tests than women aged 65-79, receipt of mammography (47.8%) and screening for colon cancer (57.0%) was still common among women aged 80 and older. Among women categorized as having been screened for colon cancer, 92.0% (n=300) had undergone colonoscopy in the past 10 years (of which 87.7% n=263 had received colonoscopy in the past 5 years). The other 8% had a flexible sigmoidoscopy in the past 5 years (n=5) or had returned stool cards in the past year (n=21). Women aged 80 and older were significantly less likely to have been screened for osteoporosis and depression than younger

women and were as likely as younger women to have received influenza and pneumococcal immunizations.

In regards to counseling, women aged 80 and older were significantly less likely to have their exercise behavior discussed than women aged 65-79 and were as likely to have nutrition discussed as women aged 65-79. Women aged 80 and older were more likely to receive counseling on falls and incontinence than younger women, however documented counseling on these issues was low for all women.

In the adjusted models, neither race, income, illness burden, nor English language proficiency, were associated with receipt of any preventive health measures. Women with Medicaid or Free Care for insurance were less likely to receive PAP smears than those with private insurance (aRR 0.2 [0.4-0.8]); insurance was not associated with receipt of any other preventive health services. Increasing number of clinic visits was associated with receipt of several preventive health services including mammography (aRR 1.3 [1.1-1.6]), flu shots (aRR 1.5 [1.2-1.8]), and screening for depression (aRR 2.0 [1.4-2.6]). Receipt of all forms of counseling were associated with increasing clinic visits, including receipt of diet (aRR 2.3 [1.4-3.8]) and exercise counseling (aRR 1.6 [1.2-2.0]), counseling on falls (aRR 3.0 [2.2-4.2]) and incontinence (aRR 2.2 [1.4-3.5]).

Figure 2 demonstrates receipt of mammography and colon cancer screening among older women by age and illness burden. Among women aged 65-84 receipt of mammography screening generally decreased with increasing age and worsening health. However for women aged 85 and older receipt of mammography was more common among women with greater illness burden than those without comorbidity. In post-hoc analyses, we found that the influence of health on the receipt of mammography screening was significantly greater for older women than younger women, such that the sickest oldest women were more likely to receive screening than elderly women in better health ($p < .001$). In the case of colon cancer screening, although screening generally decreased with age there was little variation by health. Women age 90 and older with greater illness burden were more likely to receive colon cancer testing than women in better health but these results were not statistically significant.

Conclusions and Discussion

Ideally, cancer screening should be targeted to older women in good health while screening for depression, osteoporosis, administration of immunizations, and counseling about healthy life style and geriatric health issues should be high among all older women. However, we found delivery of preventive health services to older women to be less than ideal. We found little evidence of targeting of cancer screening to elderly women in good health. In fact, among women aged 85 and older mammography was more common among women in poor health than those in better health. Screening for depression and osteoporosis and counseling about exercise were less common among women aged 80 and older than younger women. Counseling on falls and incontinence was more common among women aged 80 and older than younger women, however documentation of such counseling was low among all older women. Our findings suggest an overall need to improve delivery and targeting of preventive health care to older women.

Delivery of preventive health care to older women is complicated for many reasons. There are many preventive health services available to older women and primary care physicians are encouraged to deliver or at least discuss most of these services. Meanwhile, there is little reimbursement for counseling on screening tests and/or geriatric health issues and clinic visits are often filled with caring for patients' medical conditions that often increase as women age. In addition, guidelines vary as to the age to stop screening older women for cancer and many

recommend that physicians consider patient life expectancy. It can be difficult for physicians to estimate patients life expectancy and even when physicians are able to predict that an older woman is unlikely to live 5 or 10 years, it may be uncomfortable to discuss stopping screening with these patients (Schonberg et al., 2006b). In this setting, it is not surprising that we found that cancer screening was poorly targeted to older women in good health and that many preventive services that require physician time and counseling were poorly documented. Fortunately, there are now tools available to help clinicians estimate patient's life expectancy and guide screening decisions.

Specifically, Lee et al. created a prognostic index that includes 12 questions that patients can answer during an office visit to help predict 4 year mortality (Lee et al., 2006). Responses are weighted and those who score 14 or more points have a 64% risk of mortality in 4 years. Walter et al. (2001) also described a framework to help clinicians target cancer screening to elderly patients most likely to benefit. Clinicians are asked to estimate whether their individual patient is in the top quartile of health for their age, the bottom quartile of health for their age, or in average health for their age. Physicians are then referred to a life expectancy table that stratifies US women by age and quartiles of life expectancy to estimate their individual patient's life expectancy. Physicians can use either of these tools to help determine which of their older patients they should send for cancer screening for which they should discuss stopping screening. Ideally, greater use of these tools would result in fewer women aged 85 and older in poor health being screened for breast cancer and would result in increased use of breast and colon cancer screening among older women in good health.

Several studies have examined ways to improve health promotion among adults in primary care (Dubey et al., 2006; Robinson et al., 2001). Recommendations include physician education seminars (Kersey et al., 1999), preventive health check lists (Miller et al., 2000; Moore & Siu, 1996), computer reminders (Dexter et al., 2001), use of non-physician staff to screen for disease (Moore et al., 1997), addressing preventive health topics at multiple visits (Reuben et al., 2003), and maintaining a periodic health examination (Sox et al., 1997). In our practice we use computer reminders and preventive health check lists to help improve delivery of preventive health services to our patients. However, these reminders do not consider patients' age or life expectancy and do not include reminders for counseling on geriatric health issues. Interventions designed to improve delivery and outcomes of preventive health services that consider age and health need to be designed and tested.

It is possible that poor documentation explains our finding that counseling for healthy lifestyle and geriatric health issues was low in this study. However, short of audio or video taping all patient encounters for a year, there is no other way to validate these data. It is reassuring that counseling on falls and incontinence increased with age as these conditions are more prevalent among elderly women. However, older women were less likely to get screened for depression or counseled about exercise than women aged 65-79. These findings are especially concerning since the incidence of depression increases as women age and treating depression among older women can greatly improve an older woman's quality of life and function (Lyness et al., 2006; NIH Consensus Conference, 1992). Similarly, a growing and robust literature demonstrates that exercise can help older women maintain their independence and improve their quality of life in a short time period (Christmas & Andersen, 2000). It was interesting to learn that greater number of clinic visits was strongly associated with receipt of all forms of counseling and may indicate that when clinicians have more time with older patients they perform more counseling about preventive health. Greater compensation would also likely increase physician counseling about healthy lifestyle and geriatric health issues. As of yet, Medicare does not pay for preventive health visits for elderly women; however, physicians can bill for counseling about geriatric conditions if counseling takes up more than half of a visit.

Geriatricians recommend that preventive health care shift from focusing on longevity to focusing on optimizing quality of life and maintaining independence among elderly individuals (Fries et al., 1989). When discussing stopping cancer screening with older women in poor health, clinicians should discuss the limitations and risks associated with screening older individuals with multiple comorbidities. Clinicians should also focus preventive health discussions on measures whose benefits may be achieved in a short time frame and are more likely to be effective (e.g., counseling on falls prevention, flu shots) to help these women feel like they are not being “given up” on (Casarett & Quill, 2007).

There are several limitations to this study. Since this study is a retrospective chart review some missing data are inevitable. Some preventive health services performed at outside hospitals may not have been documented by clinicians onto the preventive health flow sheet. In addition, some of the measures may have been performed for diagnostic or disease management purposes rather than for screening, particularly among the oldest women. To address this with a history of breast cancer and colon cancer were excluded from specific analyses. Moreover, women in poor health are unlikely to receive mammograms for purposes besides screening or diagnosis of breast cancer. However, colon cancer testing for diagnoses besides cancer (e.g., anemia or constipation) is more common and may explain some of our findings. Finally, since this study was performed at one academic medical center in Boston, generalizability may be limited. However, the online medical record at this academic medical center is considered advanced, innovative, and extensive (Sands et al., 2001) and the primary care practice is known to be vigorous about preventive health (Tishler et al., 2000). Despite these limitations, this is the first study to examine delivery of preventive health measures to older women comprehensively in a primary care practice setting.

In summary, there is inadequate screening for depression and counseling about a healthy lifestyle or geriatric health issues among older women while cancer screening may be overutilized among older women in poor health. Clinicians may need to shift the focus of preventive health care among older sicker women from measures whose benefits may take years to achieve (e.g., mammography) to measures that improve quality of life and maintain independence in the short term (e.g., exercise). Since many of the preventive health measures most likely to be effective among elderly women require clinician counseling rather than simply ordering a laboratory or radiological test, clinicians may need more time with their older patients.

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Figure 1.

Sample Selection*

*This study was performed between July and December 2005 at one large academic primary care practice in Boston.

Figure 2.
Receipt of Mammography and Colon Cancer Testing among Women aged 65+ by Illness Burden.^{a,b}

a. Illness burden was measured using the Charlson Comorbidity Index or CCI.²⁵

b. This study was performed between July and December 2005 at one large academic primary care practice in Boston

* The association of illness burden and receipt of mammography and/or colon cancer testing was tested using the Chi-square test for trend for each age group of women. The asterisk signifies that illness burden was significantly associated with the receipt of the preventive health measure for that age group ($p < 0.05$).

** In post-hoc analyses the interaction of age (65-84 and 85+) and health on receipt of mammography adjusted for race/ethnicity, number of clinic visits, English language proficiency, insurance, proxy for income, and illness burden was positive ($p < 0.001$); the sickest oldest women were more likely to receive screening than elderly women in better health.

Table 1

Patient Characteristics, comparing Women aged 80 and Older and Women aged 65-79.*

	80+ years (n=299)	65-79 years (n=229)	p Value
Median age	85 years	72 years	
White (non-Hispanic)	66.7%	60.5%	0.15
Private Insurance	59.3%	66.2%	0.11
Annual Median Income of ZIP code >\$20,000	57.7%	61.0%	0.44
Patient has Male Primary Care Physician	56.0%	48.3%	0.08
English Speaking	76.3%	83.8%	0.04
Charlson Comorbidity Index 3+	24.0%	16.7%	<0.01
5 or More Clinic Visits	47.3%	32.0%	<0.01

* This study was performed between July and December 2005 at one large academic primary care practice in Boston.

Table 2

Prevalence and Likelihood of Receiving Preventive Health Measures among Women Aged 80 and Older Compared to Women Aged 65-79.*

	80+ (n=299)	65-79 (n=229)	aRR (95%CI) [†]
SCREENING TESTS			
Colon Cancer Screening in past 10 years (no history of colon cancer, 80+ n=283, 65-79 n=220)	57.0	76.0	0.8 (0.6-0.9)
Mammogram in past 2 years (no history of breast cancer, 80+ n=260, 65-79 n=209)	47.8	76.6	0.7 (0.6-0.8)
Receipt of bone densitometry	45.2	61.1	0.7 (0.6-0.9)
Pap smear in past 3 years (women w/uteri) (80+ n=227, 65-79 n=171)	10.7	41.1	0.2 (0.1-0.4)
Screening for depression in past year	23.1	35.8	0.6 (0.5-0.8)
IMMUNIZATIONS			
Receipt of Pneumovax	69.6	54.6	1.2 (1.0-1.4)
Receipt of flu shot in past 2 years	68.2	55.0	1.1 (1.0-1.3)
COUNSELING			
Diet discussed in past year	45.2	42.4	1.0 (0.9-1.2)
Exercise discussed in past year	35.1	46.3	0.8 (0.6-0.9)
Falls discussed in past year	37.7	17.1	1.9 (1.4-2.6)
Incontinence discussed in past year	26.3	13.6	1.8 (1.2-2.6)

* This study was performed between July and December 2005 at one large academic primary care practice in Boston.

[†] Adjusted relative risk estimates were calculated using the odds ratio estimates from multivariable logistic regression models and the approximation algorithm developed by Flanders and Rhodes.²⁹ Each model was adjusted for race/ethnicity, number of clinic visits, English language proficiency, insurance, a proxy for income, and illness burden.