

Delivery of Preventive Healthcare to Older African-American Patients: A Performance Comparison from Two Practice Models

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Abstract

While there is an increasing recognition by primary care providers of the importance of preventive health services (PHS), the delivery of such services has in general been substandard in many ambulatory care settings. Patient sociodemographic status and the structural and operational procedures of different clinic models are all believed to affect delivery of PHS. We conducted a 2-year, retrospective, sequentially randomized chart analysis of African-American patients above age 50, comparing primary, secondary, and tertiary PHS performance rates in two practice models: a medicine resident/faculty physician clinic (MR) and a nurse practitioner/faculty physician clinic (NP). Sociodemographics, disease profile, and PHS completion rates from 132 NP and 111 MR patient charts were abstracted. Apart from age, sociodemographic features were similar in both patient groups. While there were differences between clinics with regards to disease profiles ($P < 0.05$), and the higher number of diseases per patient ($P < 0.0001$) in the MR population, the NP collaborative practice had significantly better PHS performance. Rates of immunization (influenza/pneumococcal), pelvic/pap and prostate examinations, stool-guaiac testing, mammography, and functional assessment (activities of daily living, instrumental activities of daily living, and mental status testing) were $>90\%$ in the NP and $<60\%$ in MR patients. Although lower completion rates were found for dietary counseling (60%), auditory screening (36%), dental examination (41%), and obtaining advanced directives (24%) in the NP clinic, the rates were high-

er than those for the MR clinic. In this NP collaborative model, a high level of preventive health services was delivered while providing primary care to an older, inner city, African-American population of low socioeconomic means.

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The US Preventive Services Task Force (USPSTF) recommended in 1990 a list of Primary and Secondary Preventive Health Services (PHS) for the elderly,^{1,3} and the recently published (1996) Task Force's "Guide to Clinical Preventive Services" adds information on the effectiveness of these recommendations.⁴ Tertiary preventive services as part of routine ambulatory care for older patients are also an important part of geriatric practice.⁵ We based our PHS auditing tool on the 1990 USPSTF recommendations. One of the major goals of "Healthy People 2000" is disease prevention.^{6,7} However, physician PHS practices differ significantly from these guidelines.^{8,9} In addition, existing PHS performance studies have documented suboptimal compliance rates in different rural adult medical practices,¹⁰ in prepaid versus traditional Medicaid clinics,¹¹ in health maintenance organizations,¹² as well as within teaching hospital general medicine practices.¹³ Studies also document that PHS are inadequately delivered to inner city residents¹⁴; as a result populations in these underserved settings are particularly affected by the morbidity and mortality of preventable diseases.¹⁵ However, data for PHS, specific to geriatric practice in African-Americans, remain limited.¹⁶ This study analyzes the delivery of PHS in older African-American patients, attending two different models of practice, a traditional medicine resident/faculty physician (MR) and a nurse practitioner/faculty physician (NP) ambulatory care practice.

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Ambulatory Care

These clinics provided ambulatory care to a similar patient population, residing within the same geographical location in Detroit, MI. They also had the advantage of having the same geriatricians acting as faculty physician supervisors to the RP group and as physicians in the NP clinic. These practices are operated by the Detroit Medical Center and affiliated with the teaching program of Wayne State University, School of Medicine. The NP clinic has more than 900 patients who account for 2700 clinic visits per year, while the MR clinic with about 800 patients generates about 2400 yearly visits. Both clinics predominantly serve patients who reside in the same zip codes around the Detroit Medical Center. Each of the practices functions as a group practice, with some differences. The NP practice accepts only geriatric patients by self or physician referral, and the MR practice is an adult general medicine practice whose patients are predominantly self-referred elderly or elderly referred from the inpatient wards, emergency room, and other specialty clinics, for longitudinal primary care. These patients are assigned to residents who provide ambulatory care under the supervision of faculty physicians. Medical residents attend their clinic only one half day per week. Patients who need acute care can, however, access the clinic as needed, and are assigned to a designated medical resident taking care of walk-in patients for the day. Medical residents

spend 45-60 minutes on a new patient visit and 30 minutes for a return visit, while nurse practitioners spend about 20% more time for the initial visit. Following every patient/resident encounter, the case is presented to the faculty physician supervisor for discussion of clinical problems and plans of care.

In the NP collaborative model, patients are seen independently for a comprehensive initial visit by the nurse practitioner (a physician is available in the office suite for consultation). This visit allows the nurse practitioner to document all psychosocial issues and preventive health data and schedule follow-up PHS. Every patient is subsequently seen by the physician at the next clinic visit and at least once a year thereafter. In addition, patients are also seen by the physician when medically unstable, following an emergency room visit, or as a follow-up visit after hospitalization.

... METHODS ...

This retrospective, sequentially randomized chart analysis was conducted at both an NP and RP practice site. From the current practice list of patients, every fifth chart was made available for study. Inclusion criteria required patients to be African-Americans over the age of 50 who had received ambulatory care during a 2-year period. A total of 132 patient charts in the NP group and 111 in the MR clinic were reviewed. It was difficult to blind the chart analysis process as to the source; however, no outcome hypothesis was made prior to the study. Trained chart abstractors (Y.C., A.A.) collected data on: (1) sociodemographic variables (age, sex, marital status, health insurance, housing, education and income levels). Education level was recorded as the number of years of formal schooling (Primary/Elementary School = up to 8 years; High School and College = 9 years and above) and income levels as below or above \$1000 per month. (2) Disease profile and medications prescribed were obtained from the problem list, medication

Table 1. Primary, Secondary, and Tertiary Preventive Health Services

Primary	Secondary	Tertiary
Influenza Vaccine*	Breast Exam*	Activities of Daily Living (ADL)*
Pneumococcal Vaccine*	Pelvic/Pap Smear*	Instrumental Activities of Daily Living (IADL)*
Alcohol Counseling*	Prostate Exam†	Mini Mental Status Exam (MMSE)
Smoking Counseling*	Guaiac Test‡	
Exercise Counseling*	Mammography*	
Diet Counseling*	Prostate Specific Antigen‡	
Ophthalmological Exam*		
Audiological Exam*		
Dental Exam†		
Advance Directives‡		

Adapted from references 2, 3 and 17.

*Denotes recommended as per US Preventive Services Task Force (USPSTF) guidelines.

†Denotes recommended as per USPSTF guidelines in selected patients.

‡Denotes either no recommendations or not considered by USPSTF

list, and progress notes. (3) Completion rates for PHS were compiled from the PHS chart record and progress note sections of the chart, only if there was documentation that these health maintenance activities were performed. Patients above age 65 were credited with Pap-smear compliance if there was documentation of two consecutive negative Pap-smears after attaining age 60. Based on a literature review, we identified 10 primary, 6 secondary, and 3 tertiary PHS for study (Table 1). The 2-year window was considered adequate to allow for performance of the health maintenance activities identified for study.

Covariates analyzed included age, gender, education, marital status, income, medical insurance, and disease profile. The latter was obtained from the problem list maintained on every chart in both clinics. Chi-square test was used to analyze categorical variables. Differences among the study groups were determined using analysis of variance (ANOVA). Statistical significance was established using the two sample *t* test and was assigned at *P* < 0.05. All data analysis was performed using SPSS for Windows (SPSS Inc, Chicago, IL, v6.0) software.

... RESULTS ...

Table 2 depicts the demographics of age, gender, education, marital status, income, and health insurance coverage for the two clinic groups. There was a statistical difference (*P* < 0.001) in age between the two groups, with the mean age in the MR group being 74.07 ± 7.47 years, as compared to 77.39 ± 7.73 years in the NP clinic. There were no statistical differences in other sociodemographic variables. Most patients, 80.3% in the NP and 89.19% in the MR clinics, had monthly incomes below \$1000 per month. Figure 1 displays the disease categories; between clinics there were statistical differences (*P* < 0.05) in cardiac, gastrointestinal, renal, musculoskeletal, and psychiatric diseases as well as dementia and incontinence. The total

number of diseases per patient was statistically different (*P* < 0.0001): MR clinic had 3.79 ± 1.77 as compared to NP clinic with 2.94 ± 1.56. The higher prevalence of diseases in the resident clinic may reflect the pattern of referral of recently hospitalized patients for outpatient follow-up to this practice. Figures 2 and 3 analyze the performance of primary and secondary PHS rates between the two groups of clinic patients. A high performance rate (>80%), especially in areas of secondary and tertiary PHS (Figure 4), was achieved in NP practice. Some primary PHS (dietary and exercise counseling; audiological and dental examinations; and the establishing of advance directives) had lower completion rates. Lower rates of health maintenance performance (<60%) were noted in the MR patients across all areas of PHS. The NP practice was able to achieve >90% compliance with tertiary preventive services in contrast to the MR practice, where this area of health maintenance was in general neglected.

... DISCUSSION ...

The success of preventive care in controlling com-

Table 2. Characteristics of Sample

Variable	NP (n = 132)	MR (n = 111)	P Value
Number	132 (54.12%)	111 (45.88%)	—
Age (years)	77.39 ± 7.73	74.07 ± 7.47	0.001
Sex			0.750
Male	38 (28.79%)	29 (26.13%)	
Female	94 (71.21%)	82 (73.87%)	
Education			0.099
Primary school	34 (25.76%)	18 (16.22%)	
High school and college	98 (74.24%)	93 (83.78%)	
Marital status			0.505
Single*	9 (7.50%)	88 (79.28%)	
Married	32 (24.24%)	22 (19.82%)	
Income range (monthly)			0.085
Up to \$1000	106 (80.30%)	99 (89.19%)	
\$1001+	26 (19.70%)	12 (10.81%)	
Insurance (primary)			0.112
Medicare/Medicaid	123 (93.18%)	97 (87.39%)	
Blue Cross/Blue Shield	6 (4.55%)	5 (4.50%)	
None	3 (2.27%)	9 (8.11%)	
Number of diseases	2.94 ± 1.56	3.79 ± 1.77	0.0001

Values are Mean ± SD or numbers and %
*Single (includes widowed, separated, or divorced).

Figure 1. Percentage Incidence by Disease Category in the Two Clinic Models

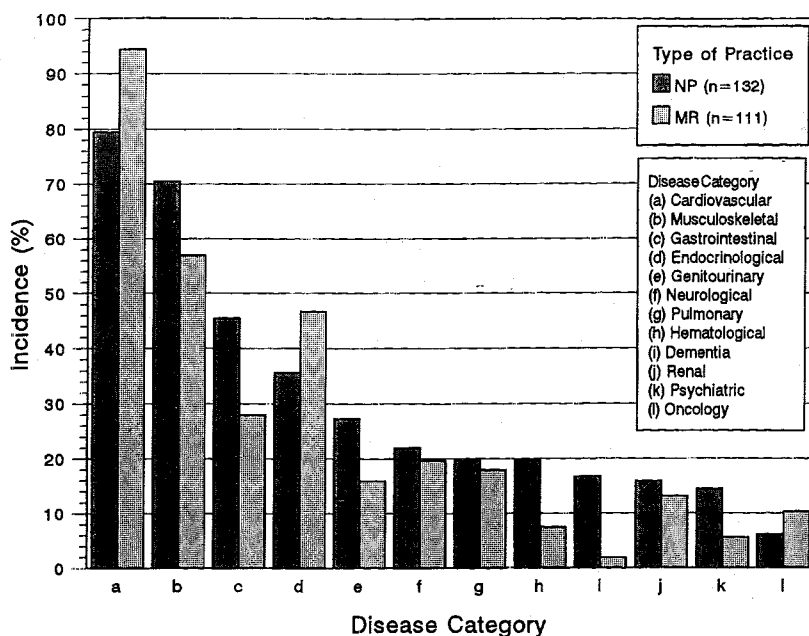
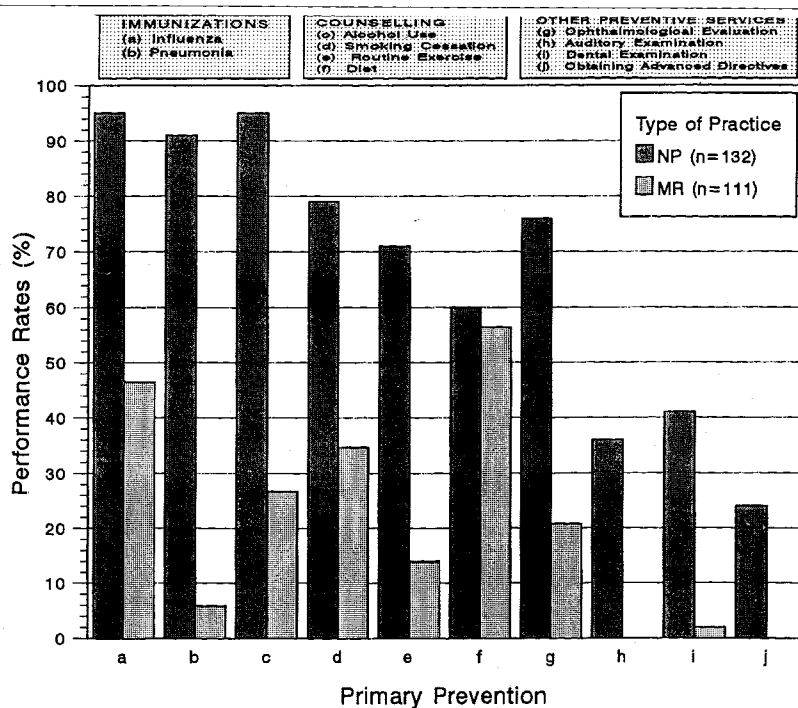


Figure 2. Primary Prevention Performance Rates from the Two Clinic Models



municable diseases during the first half of this century ushered in the "Era of Preventive Medicine." However, shifts in morbidity and mortality patterns toward cardiac, cerebrovascular, and cancer diseases, coupled with rapid progress in diagnostic technology, changed the medical focus toward a "disease model" of medical care. During the last decade there has been a renewed emphasis on health promotion and disease prevention. While disease prevention has long been a focus in children, its importance has been only recently emphasized in older adults. Recommendations for preventive healthcare in adults have been summarized by Sox,¹⁷ and there is also increasing awareness that preservation of function and improvement of quality of life are of special relevance to the elderly.^{5,18}

Unfortunately, a number of barriers to PHS exist, ranging from problems with dissemination and transfer of knowledge,¹⁹ to issues pertaining to health beliefs,²⁰ and other factors associated with acceptance of health maintenance services.²¹ Compliance is also adversely affected by inadequate delivery of PHS to minorities,¹² by difficulty with access to rural practice sites,²² and problems related to inadequate health insurance coverage.²³ Low socioeconomic patient profiles have also been noted to adversely affect PHS compliance and lead to excess mortality from preventable diseases.¹⁵ National trends in PHS among older African-American families have shown that despite large increases in the numbers of breast examinations and Pap smear preventive services, compliance rates still remained comparatively low.¹⁶ This was not the case in the NP clinic we studied, where mammography and pelvic

exam completion rates exceeded 95%. In addition, high performance rates were also achieved for most secondary and tertiary PHS despite the low socioeconomic patient profile.

The lower compliance rates achieved in our RP model are similar to results noted by other investigators when they analyzed health maintenance performance at general internal medicine practices in university teaching hospitals.¹³ Various studies suggest that the lower PHS compliance rates in physician and resident practices may reflect issues including having to care for recently discharged sicker patients, managing a patient population with higher levels of chronic illnesses, the lack of continuity that results from changing residents every few years, and the inherent difficulties of providing ambulatory care in large hospital clinics.^{24,25} A provider gender bias in the context and relevance of particular medical tasks may also influence PHS performance rates.²⁶ The rising costs of office-based practice and lack of incentives for PHS are also important factors to be considered.²⁷ In addition, during medical school training,^{18,28} a greater emphasis on diagnosis and treatment,^{29,30} at the expense of disease prevention,^{18,28} is a factor that may be responsible for physicians devoting less attention to PHS in their practices. Practice structure also has an effect, as the general medicine residency teaching practice format tends to inhibit quality outcome performances.¹³ Woo et al³⁰ analyzed screening procedures in ambulatory practices and noted that physicians, despite having a high expectation for preventive

Figure 3. Secondary Prevention Performance Rates from the Two Clinic Models

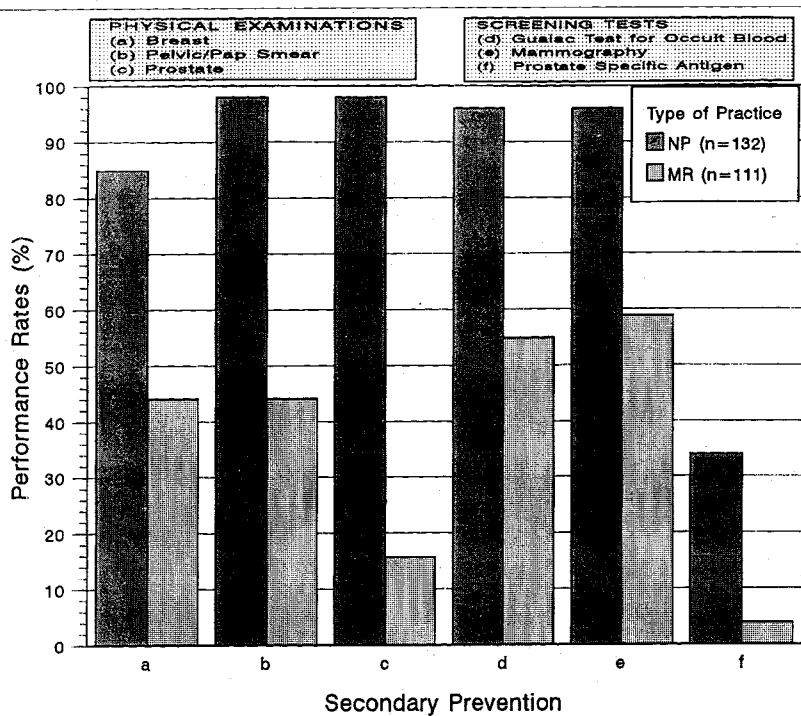
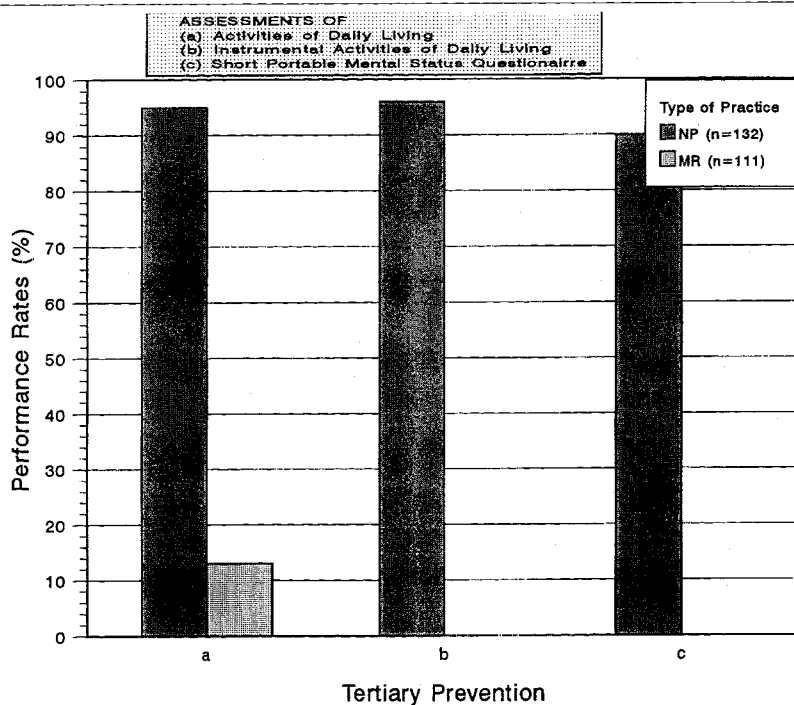


Figure 4. Tertiary Prevention Performance Rates from the Two Clinic Models



healthcare maintenance for their patients, in practice perform these procedures less frequently. We believe some of these factors are relevant to our MR clinic. Clinical educators will have to consider innovative curriculum changes at medical student and resident levels if the goals to provide more effective skills and attitudes toward achieving better health maintenance outcomes are to be enhanced. While the effectiveness of traditional educational methods alone for improving the delivery of PHS remains questionable, when coupled with timely physician feedback, improved outcomes have been documented.³¹⁻³³

Data on the effects of provider style within collaborative practices indicate nurse practitioners exhibit more concern for patient psychosocial issues as compared to physicians.²⁸ A study conducted in 1986 by the Office of Technology Assessment (OTA) of the US Congress concluded that nurses in primary care roles were "more adept than physicians" in areas of preventive care.³⁴ In a nurse/physician collaborative practice, "nurses and physicians collaborate as colleagues to provide patient care,"³⁵ including both independent and cooperative decision making based on the preparation and ability of each practitioner.³⁶ These roles are complementary and provide for comprehensive patient care.

This current study documents the ability to provide successful health maintenance to a predominantly African-American geriatric patient group through a NP model of ambulatory care. The socioeconomic profiles of both patient groups, in the NP and MR clinics, were similar. Most patients had received less than 12 years of formal schooling and had total incomes of under \$12,000/year, the majority (52%) reporting incomes less than \$500/month. Despite these socioeconomic barriers, patients receiving their ambulatory care in the NP clinic achieved high preventive care completion rates. Similar high compliance rates across this range of PHS have not, to our knowledge, been reported previously in a similar sociodemographic patient population.

A variety of interventions to improve compliance of PHS have been described. Patient education, either alone or in conjunction with provider education, has had limited success in improving vaccination rates in adults.³⁷ Flowsheets as an aid have not had a sustained effect in changing physician behavior,³⁸ nor have patient prompts facilitated patient compliance with PHS.^{33,38} Interventions that have had a positive effect on compliance rates include the

use of nonphysician care providers,^{37,39,40} administrative changes that promote strategies to facilitate PHS delivery systems,⁴¹⁻⁴³ a multifaceted physician education program implemented at an inner city municipal hospital,⁴⁴ and computerized reminder systems.⁴⁵ Interventions designed to improve PHS compliance in our resident practices by emphasizing preventive healthcare in the ambulatory care curriculum are currently being implemented. In addition, resident physicians will be expected (following every clinic visit) to discuss with their supervisors, and document on the chart, the current status of health maintenance activities for every patient seen. It is hoped that this intervention, which allows faculty supervising physicians to utilize reinforcement techniques, will improve resident physician attitudes, knowledge, and skills in preventive care. Over a period of a year, we will assess the outcomes of this intervention in terms of performance of health maintenance activities in the RP practice.

The high PHS performance rates achieved by the NP clinic, in this population of elderly inner city African-American patients, of low socioeconomic means, demonstrate that despite these demographic barriers, health maintenance delivery was successfully conducted in this collaborative practice model. We recognize that generalization to other clinic models may be limited by the fact that the NP clinic providers are specially trained in geriatrics. While the NP clinic's ability to overcome socioeconomic barriers to PHS is encouraging, it raises interesting questions. Are the low compliance rates in physician and resident practices related to physician attitudes, a lack of time, inadequate reimbursement for PHS, or disagreement as to what are the essential requirements for health maintenance activities? Is the high PHS performance rate by the NP practice a result of special provider (nurse practitioner) training, or does it represent a selection bias in both recruitment and retention of particular patient populations having special needs? Does the different organizational process of care delivery in the NP model of practice facilitate delivery of PHS? If so, further research is necessary to establish what is the most cost-effective mix for provider types (nurses and physicians) and primary care roles within such practice models.^{34,46} The only conclusion that can be made from this study is that our model of nurse/physician collaborative practice was able to achieve a high performance of PHS, in an older, inner city African-American patient population, despite socioeconomic barriers.

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