

# Cardiovascular Disease Prevention Counseling in Residency: Resident and Attending Physician Attitudes and Practices

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**Purpose:** This study seeks to establish resident and attending physician attitudes and practice patterns with regard to cardiovascular disease (CVD) preventive counseling within a teaching hospital setting.

**Methods:** A 75-question survey was administered to residents and their attending physicians within a single academic medical residency program at a large, urban public hospital.

**Results:** Physician CVD risk factor counseling rates were lowest for exercise and diet (16% and 20%, respectively) and somewhat higher, although not ideal, for medication compliance and smoking (52% and 88%, respectively). Physicians did not often recommend behavior change strategies, and few physicians felt very effective in their counseling of smoking, exercise, diet, and weight reduction (25%, 24%, 27%, and 23%, respectively). Physicians acknowledged the existence of many patient, physician, and system barriers that interfered with providing more preventive counseling. There were few differences in counseling practices and attitudes between residents and attending physicians, and no significant gender differences.

**Conclusions:** Our study found low counseling rates for CVD prevention, particularly in the areas of diet, exercise, and weight loss. Future interventions should highlight the importance of diet, exercise, and weight control in preventing CVD, and efforts should be directed toward training both resident and attending physicians, as counseling rates are low in both groups.

**Key words:** knowledge ■ attitudes ■ practices ■ prevention ■ counseling ■ barriers ■ self-efficacy ■ cardiovascular risk factors ■ diet ■ exercise ■ smoking

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## INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in the United States and worldwide.<sup>1,2</sup> According to CDC statistics, one in every four Americans suffers from the effects of heart disease and stroke. Heart disease and stroke account for nearly six million hospitalizations each year. Current figures indicate that CVD costs the United States \$300 billion each year in health expenditures and lost productivity.<sup>3</sup> The burden of CVD morbidity and mortality worldwide is expected to increase as populations age and lifestyles are adapted to industrialized economies.<sup>4</sup>

The majority of CVD in the United States is linked to preventable health-related behaviors, such as smoking, diet, and sedentary lifestyle.<sup>5,6</sup> Two recent studies reviewing the presence of traditional risk factors (smoking, diabetes mellitus, hypertension, and hypercholesterolemia) in patients with coronary heart disease (CHD) showed that 80–90% of patients who had CHD and greater than 90% of patients who experienced a fatal CHD event had one or more major risk factors.<sup>7,8</sup> These data contradict earlier assumptions that up to half of CHD patients did not have risk factors and provides further evidence that CVD is an epidemic related to modifiable risk factors.<sup>9</sup> Approximately 23% of the U.S. population smokes,<sup>10</sup> and over 60% of adults do not achieve the daily recommended amount of physical activity.<sup>11</sup> Recent data show that 64.5% of U.S. adults are overweight and that 30.5% are obese.<sup>12</sup> These figures are significantly higher than the targets set for the nation in *Healthy People 2010*.<sup>13</sup>

Recent guidelines from the National Cholesterol Education Program and the American Heart Association highlight the need for primary prevention of CVD through identification and reduction of risk factors.<sup>14,15</sup> Primary care providers may be uniquely situated to provide this care. As the majority of middle-aged patients visit their primary care physician several times each year, these visits provide many opportunities for preventive counseling. Yet most

physicians do not counsel patients aggressively about CVD risk factors. Data from large, national surveys reveal that fewer than half of obese patients are counseled by their physicians to lose weight.<sup>16,17</sup> Another review found that only 34% of all patients who had seen a physician in the previous year were counseled to exercise.<sup>18</sup> A study that reviewed charts of family practice residents within an eight-site family medicine network found that only 45% of smokers and 20% of patients with hypercholesterolemia were counseled for those risk factors.<sup>19</sup> A study of the directly observed behavior of 138 community family

physicians found that delivery of at least one preventive service occurred during only 33% of all illness visits.<sup>20</sup> In that study, physicians counseled infrequently on smoking (42%), exercise (42%), and diet (13%). Even diabetic patients, despite being at greater risk for CVD, receive low rates of CVD preventive services during office visits, and, in some cases, their rates of receiving counseling do not differ from nondiabetic patients.<sup>21,22</sup>

Our study was conducted to assess the attitudes and practices of internal medicine residents and attending physicians in a teaching hospital with regard to CVD prevention counseling. Based on prior literature, we hypothesized that counseling rates for modifiable CVD risk factors among physicians would be low. However, we were interested if significant differences in counseling practices and attitudes between attending and resident physicians would exist and whether rates of counseling would vary for different risk factors. We also examined whether attitudinal and system barriers would contribute to low levels of preventive counseling within an inner-city teaching program.

## METHODS

### Study Setting

A survey was administered to Emory University Internal Medicine residents and attending physicians who worked in the medicine clinics at Grady Memorial Hospital, a 1,000-bed, inner-city, indigent care teaching hospital located in Atlanta, GA. The primary care outpatient medical clinics of Grady Memorial Hospital serve a primarily older (mean age 61), female (66%), African-American (93%), low-literate (third-to-fifth-grade reading level), and lower-socioeconomic status (SES) population. A high percentage of patients suffer from hypertension (78%), obesity (45%), high cholesterol (38%), and diabetes (26%). Patients also engage in many high risk behaviors for CVD, including smoking (23%), and sedentary lifestyles (39%).<sup>23</sup>

| Characteristic               | Attending<br>(N=15)<br>Percentage (%) | Resident<br>(N=67)<br>Percentage (%) |
|------------------------------|---------------------------------------|--------------------------------------|
| Male                         | 47                                    | 58                                   |
| Female                       | 53                                    | 42                                   |
| Age                          |                                       |                                      |
| 21-25                        | —                                     | 15                                   |
| 26-30                        | —                                     | 75                                   |
| 31-35                        | 25                                    | 9                                    |
| 36-40                        | 42                                    | 2                                    |
| 41-50                        | 16                                    | —                                    |
| 51-60                        | 16                                    | —                                    |
| Race                         |                                       |                                      |
| Black                        | 7                                     | 8                                    |
| White                        | 87                                    | 67                                   |
| Asian/Pacific Islander       | 7                                     | 14                                   |
| Other                        | —                                     | 12                                   |
| Born in the United States    | 93                                    | 81                                   |
| U.S. medical school graduate | 100                                   | 94                                   |

\* Numbers may not add up due to missing information on certain questions

| Health Issue          | Total (N=82) | Physician Training Level |                 | P Value |
|-----------------------|--------------|--------------------------|-----------------|---------|
|                       |              | Attending (N=15)         | Resident (N=67) |         |
| Percentage (%)        |              |                          |                 |         |
| Exercise              | 16           | 21                       | 15              | 0.55    |
| Diet                  | 20           | 36                       | 18              | 0.14    |
| Smoking               | 88           | 86                       | 88              | 0.81    |
| Medication compliance | 52           | 79                       | 45              | 0.025*  |

\* p<0.05

## Physician Subjects

The survey was administered to 71 internal medicine house officers and 17 attending physicians from the Emory University residency-training program. Sixty-seven residents and 15 attending physicians completed the survey for an overall response rate of 93.2%. Table 1 shows the demographic characteristics of attending physicians and residents. Fifty-eight percent of the residents and 47% of the attending physicians were male. The overwhelming majority were white and graduates of U.S. medical schools.

## Survey Design

Physicians were asked to answer hypothetical patient care questions regarding healthcare services provided to patients seen in the medical clinics of the hospital. The survey instrument was 75 questions in length and based on a similar questionnaire developed by Gemson, et al.,<sup>24</sup> with some additional modifications. Variables analyzed included physician demographics, counseling practices when seeing new patients without CVD risk factors, counseling practices when seeing patients with CVD risk factors, counseling attitudes, barriers to providing preventive care, and perceived effectiveness of preventive coun-

| CHD Risk Factor                                                |              | Physician Training Level |                 |        | P Value |
|----------------------------------------------------------------|--------------|--------------------------|-----------------|--------|---------|
| Counseling Practices                                           | Total (N=82) | Attending (N=15)         | Resident (N=67) |        |         |
|                                                                |              | Percentage (%)           |                 |        |         |
| <i>Obesity</i>                                                 |              |                          |                 |        |         |
| Discuss weight reduction                                       | 42           | 47                       | 40              | 0.65   |         |
| Review health risks of obesity                                 | 60           | 53                       | 61              | 0.58   |         |
| Advise decreased caloric intake                                | 48           | 60                       | 45              | 0.29   |         |
| Advise regular exercise                                        | 61           | 60                       | 41              | 0.93   |         |
| Set a goal for weight loss                                     | 24           | 40                       | 21              | 0.12   |         |
| <i>Hypertension</i>                                            |              |                          |                 |        |         |
| Review health risks of high blood pressures                    | 34           | 43                       | 33              | 0.48   |         |
| Advise weight loss, if patient is overweight                   | 48           | 60                       | 45              | 0.29   |         |
| Advise regular exercise                                        | 40           | 47                       | 39              | 0.58   |         |
| Review medication adherence                                    | 69           | 73                       | 67              | 0.64   |         |
| Advise stress reduction                                        | 6            | 13                       | 4               | 0.20   |         |
| <i>High Blood Cholesterol</i>                                  |              |                          |                 |        |         |
| Review health risks of high blood cholesterol                  | 43           | 64                       | 39              | 0.09   |         |
| Advise weight loss, if patient is overweight                   | 48           | 71                       | 42              | 0.049* |         |
| Advise regular exercise                                        | 39           | 50                       | 36              | 0.34   |         |
| Advise decreased saturated fat                                 | 41           | 79                       | 33              | 0.002* |         |
| Advise decreased dietary cholesterol                           | 52           | 79                       | 47              | 0.03*  |         |
| <i>Sedentary Lifestyle</i>                                     |              |                          |                 |        |         |
| Review health benefits of exercise                             | 58           | 47                       | 61              | 0.30   |         |
| Suggest appropriate exercise for patient                       | 29           | 20                       | 30              | 0.45   |         |
| Give specific instructions on how to exercise safely           | 13           | 13                       | 14              | 0.98   |         |
| Set a specific exercise goal, including frequency and duration | 17           | 13                       | 18              | 0.66   |         |
| <i>Smoking</i>                                                 |              |                          |                 |        |         |
| Discuss stopping smoking                                       | 74           | 87                       | 72              | 0.23   |         |
| Review economic benefits of quitting                           | 19           | 15                       | 20              | 0.72   |         |
| Recommend quit-smoking program                                 | 54           | 30                       | 58              | 0.08   |         |
| Review health risks                                            | 75           | 67                       | 77              | 0.39   |         |
| Set a specific quit date                                       | 16           | 29                       | 14              | 0.17   |         |
| Prepare the patient for withdrawal symptoms                    | 20           | 21                       | 21              | 0.96   |         |
| * p<0.05                                                       |              |                          |                 |        |         |

seling. When assessing physician counseling practices, participants were offered four categories of response: “always,” “usually,” “occasionally,” or “rarely/never.” When assessing attitudes to counseling, physicians were asked to rate the relative importance of counseling specific risk factors as “very important,” “somewhat important,” “unimportant,” and “don’t know/not sure.” Perceived counseling efficacy on specific risk factors was determined by the responses “very effective,” “moderately effective,” “somewhat effective,” and “minimally effective.” Barriers to counseling were determined by answering “yes” or “no” to the stated the barrier (i.e., “physicians receive little training in prevention”).

### Data Analysis

Survey responses were analyzed using EpiInfo statistical software (version 6.04A) and SAS statistical software (version 8.2). Frequency analysis was performed for categorical variables for total sample, then separately for men vs. women, residents vs. attending physicians. Frequency of ideal behavior (numbers of physicians who reported “always” counseling risk factors, number of physicians reporting at least moderate effectiveness in counseling, etc.) were tabulated. A Chi-squared analysis was conducted to assess sig-

nificant differences in binomial count data ( $p < 0.05$ ) based on physician training level (i.e., attending faculty vs. resident) or physician gender (male vs. female). All requirements for Chi-squared analysis were met (no cells had less than five expected outcomes, etc.). Chi-squared analysis was also conducted to compare frequency of counseling for exercise, smoking, medication compliance, and diet to assess for significant differences and to compare the frequency of counseling exercise for patients with and without risk factors for CVD.

### RESULTS

#### Physicians' CVD Counseling Practices

Prevention counseling rates were significantly lower for exercise and diet than for smoking and medication compliance (Table 2). Only 16% and 20% of physicians reported that they “always” counseled about exercise and diet, respectively, whereas 88% and 52% reported counseling smoking cessation and medication adherence, respectively ( $p < 0.0001$ ). Attending physicians were significantly more likely than residents (79% vs. 45%) to “always” counsel new patients about medication compliance ( $p = 0.025$ ). No other statistically significant differ-

**Table 4. Percentage of Physicians Who Considered Counseling about the Following CVD Risk Factors “Very Important”**

| CVD Risk Factors                 | Total (N=82) | Physician Training Level |                 | P Value |
|----------------------------------|--------------|--------------------------|-----------------|---------|
|                                  |              | Attending (N=15)         | Resident (N=67) |         |
| Percentage (%)                   |              |                          |                 |         |
| Cholesterol                      | 85           | 93                       | 82              | 0.28    |
| Blood pressure                   | 93           | 93                       | 93              | 0.92    |
| Exercise                         | 76           | 80                       | 76              | 0.75    |
| Diet                             | 76           | 87                       | 75              | 0.32    |
| Smoking                          | 100          | 100                      | 100             | —       |
| Weight reduction                 | 79           | 73                       | 81              | 0.53    |
| Taking blood pressure medication | 95           | 100                      | 96              | 0.41    |

**Table 5. Percentage of Physicians Reporting at Least “Moderate” Effectiveness in Preventive Patient Counseling**

| Health Issue                   | Total (N=82) | Physician Training Level |                 | P Value |
|--------------------------------|--------------|--------------------------|-----------------|---------|
|                                |              | Attending (N=15)         | Resident (N=67) |         |
| Percentage (%)                 |              |                          |                 |         |
| Smoking cessation              | 25           | 27                       | 26              | 0.94    |
| Exercise                       | 24           | 20                       | 26              | 0.64    |
| Healthy diet                   | 27           | 27                       | 26              | 0.97    |
| Taking blood pressure medicine | 69           | 80                       | 67              | 0.32    |
| Weight reduction               | 23           | 13                       | 24              | 0.36    |

ences between attending physicians and residents were found. Additionally, no significant differences were found in CVD counseling practices for new patients based on physician gender (data not shown).

With respect to specific CVD risk factors, the level of physician training was generally not a determining factor in the patterns of counseling (Table 3). However, attending physicians were more likely than residents to “always” counsel patients with high blood cholesterol about specific dietary recommendations. Attending physicians were significantly more likely than residents to “always” counsel patients with high blood cholesterol about decreased saturated fat intake, decreased dietary cholesterol intake, and weight loss (Table 3). There were no other significant differences in CVD counseling based on physician gender (data not shown).

Physicians were significantly more likely to provide CVD preventive care on exercise to patients with risk factors, such as obesity, hypertension, high blood cholesterol, sedentary lifestyle, and/or smoking, than to patients without such risk factors (Tables 2 and 3). Exercise counseling was “always” recommended in only 16% of patients without other CVD risk factors. For patients with obesity, hypertension, and high blood cholesterol, physicians always addressed counseling 61%, 40%, and 39% of the time, respectively (Table 3). The difference in exercise counseling frequency for patients with CVD risk factors compared to those without was significant ( $p \leq 0.001$ ).

Physicians did a poor job helping patients set a plan to make behavioral changes. Only 16% of physicians encouraged patients that smoke to set a

quit date. Few physicians set an exercise goal (17%), suggested specific exercises (29%), or gave specific instructions about exercise safety (13%) when counseling their sedentary patients (Table 3).

### Physicians' CVD Counseling Attitudes

The majority of respondents felt that it was “very important” to counsel patients about cholesterol, blood pressure, exercise, diet, smoking, weight reduction, and blood pressure medication compliance (Table 4). However, there were differences in the percentages of physicians who felt it was “very important” to counsel based on the type of risk factor. While 100% of physicians felt it was “very important” to counsel on smoking and 95% felt it was “very important” to counsel compliance with blood pressure medications, only 76% felt it was “very important” to counsel on exercise and diet, and only 79% felt it was “very important” to counsel on weight reduction.

### Physicians' Perceived Lifestyle Counseling Effectiveness

Physicians felt significantly more effective when counseling on medication compliance than smoking cessation, diet, and weight (Table 5). Less than one-third of physicians felt “very” or “moderately” effective when counseling their patients about smoking cessation, exercise, healthy diet, or weight reduction, compared to 69% of physicians who felt at least “moderately” effective counseling on medication compliance ( $p < 0.0001$ ). There was no significant difference between attending and resident physicians in their perceived effectiveness in counseling.

**Table 6. Factors Affecting Physician Counseling (Percentage “Yes”)**

| Attitudinal Barriers                                              | Total (N=82)   | Physician Training Level |                 | P Value  |
|-------------------------------------------------------------------|----------------|--------------------------|-----------------|----------|
|                                                                   |                | Attending (N=15)         | Resident (N=67) |          |
|                                                                   | Percentage (%) |                          |                 |          |
| Recommendations on prevention are unclear                         | 35             | 80                       | 23              | 0.00002* |
| Physicians receive little training in prevention                  | 83             | 100                      | 78              | 0.051    |
| Physicians are not interested in prevention                       | 35             | 47                       | 30              | 0.23     |
| Physicians value acute care more than preventive care             | 67             | 80                       | 61              | 0.19     |
| Physicians are not very knowledgeable about prevention guidelines | 55             | 80                       | 48              | 0.028*   |

\*  $p < 0.05$

## Physicians' Self-Reported Barriers to Prevention

The majority of physicians felt limited in their prevention practices by a lack of preventive care training (83%), and by a lack of knowledge about prevention guidelines (55%), and by general attitudes which value "acute" care more than preventive care (67%). Significant attitudinal differences were found between attending physicians and residents with regard to prevention recommendations and training. Attending physicians were significantly more likely than residents to state that "unclear" prevention recommendations were a limitation to providing preventive care. Significantly more attending physicians than residents felt that physicians were not very knowledgeable about current prevention guidelines and that physicians receive little training in prevention. Other barriers to prevention cited by physicians included lack of time, perceived lack of patient interest, missing or inadequate information in patient charts, communication difficulties with patients, and cultural differences between doctors and patients (Table 7).

## DISCUSSION

Physicians play a key role in providing both curative and preventive healthcare. Counseling may be an effective tool in reducing behavioral risk factors for CVD. Yet, physicians do not counsel their patients aggressively about lifestyle changes to prevent CVD.<sup>17-20</sup> As hypothesized, the reported frequency of preventive counseling in this study was low, especially for diet, exercise, and weight loss. Rates of counseling for smoking cessation and medication adherence were much higher than for other CVD risk factors, a finding which has been reported by others.<sup>20,25</sup> Counseling behaviors mirrored physicians' beliefs about the

importance of different risk factors: more physicians reported counseling for smoking cessation and medication adherence was "very important" than exercise, diet, and weight reduction. This suggests that messages about the importance of diet, exercise, and weight control for prevention of CVD are not reaching most physicians.

Rates of exercise promotion were higher for patients with risk factors for CVD than patients without risk factors. This finding is in agreement with previous research which indicates a lower prevalence of physician counseling for CVD risk factors among patients without risk factors or pre-existing disease than without.<sup>18,21,26,27</sup> While counseling only high-risk patients may be a time-efficient strategy, physicians miss an important opportunity to prevent CVD if they do not promote healthy lifestyles to patients without major risk factors.

Physicians reported low rates of using proven behavioral techniques when counseling patients. They did not tell patients how much and what kind of exercise to do, did not encourage patients to set quit dates for smoking, or give specific goals for weight loss. Physicians' failure to recommend key behavior strategies has been noted in prior studies.<sup>28,29</sup> The poor quality of counseling skills may make physicians' efforts less effective, which may, in turn, reinforce negative attitudes and low confidence in counseling skills.

Only approximately one-quarter of providers reported feeling "effective" when providing preventive patient counseling about smoking cessation, exercise, and weight reduction. This is of particular concern, because physician confidence levels have been correlated with their counseling practices.<sup>30-32</sup> In this study, however, counseling rates for smoking cessation were high, despite the fact that few physi-

**Table 7. Barriers to Counseling (Percentage "Yes")**

| Attitudinal Barriers                                | Total (N=82) | Physician Training Level |                 | P Value |
|-----------------------------------------------------|--------------|--------------------------|-----------------|---------|
|                                                     |              | Attending (N=15)         | Resident (N=67) |         |
| Percentage (%)                                      |              |                          |                 |         |
| Lack of time                                        | 94           | 87                       | 96              | 0.79    |
| Missing or inaccurate information on patient charts | 71           | 79                       | 70              | 0.45    |
| Communication difficulties with patients            | 63           | 60                       | 64              | 0.76    |
| Cultural differences between doctors and patients   | 61           | 80                       | 57              | 0.10    |
| Lack of patient interest                            | 81           | 64                       | 85              | 0.13    |

cians felt their counseling on this topic was effective. This is perhaps because these physicians felt uniformly (100%) that it was important to counsel against smoking. Indeed, studies have also demonstrated the importance of attitude (believing that counseling is important) in determining physicians' counseling practices.<sup>30,31,33</sup> This demonstrates the need to intervene on multiple levels (provide skills, enhance self-efficacy, and improve attitudes) to effect physician behavior.<sup>34-36</sup>

In an attempt to understand reasons for low rates of preventive counseling, we queried physicians on potential limitations and physical barriers to counseling. Attending physicians and residents alike agreed with the existence of many practical barriers, such as lack of time and missing charts. In addition, the majority of physicians cited communication and cultural differences as possible barriers to preventive counseling. This may have been specific to the physicians surveyed, as the majority of them were Caucasians practicing in a clinic with a predominantly African-American, low-income patient population. This finding may support the need for "cultural competency" training for residents.

Our study explored whether physician training level was predictive of counseling behaviors and attitudes, a subject not previously addressed in the literature to our knowledge. Our data indicated that attending physicians were no more likely to counsel patients with CVD risk factors than were resident physicians. There are several possible explanations for this finding. Perhaps attending physicians felt that the literature supporting physician counseling was not compelling, or else they were unfamiliar with the American Heart Association recommendations.<sup>15</sup> Attending physicians were much more likely than residents to state that recommendations on prevention were unclear or that physicians were not very knowledgeable about current prevention guidelines. Another explanation is that attending physicians may have been more aware of deficiencies in the literature supporting the efficacy of physician counseling.<sup>37,38</sup>

Although previous studies have found physician gender differences in preventive counseling practices,<sup>39</sup> our study did not. The attitudes and practices of male and female attending and resident physicians with regard to CVD risk factor counseling were alike in this study. This could be because our sample size of this study was not very large or because the differences based on gender are not as marked in an academic setting.

Limitations of our study were the relatively small sample size (N=84), the fact that the study was carried out among only one residency program, and reliance on physician self-report. The latter method of data collection may have resulted in an overestimation of actual

prevention counseling attitudes and practices. However, since our findings indicate a low level of counseling practices, this adds weight to the concern that physicians are undercounseling for CVD prevention.

In summary, our study adds to the growing body of literature that primary care physicians do not adequately address CVD prevention, and, in particular, the importance of diet, exercise, and weight control. Most importantly, our study did not find any differences in counseling practices between attending physicians and residents, a finding that highlights the need to create interventions in residency for both residents and their attending physicians.

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