Cardiac Risk Underestimation in Urban, Black Women

Karen B. DeSalvo, MD, MPH, MSc,¹ Jessica Gregg, MD, PhD,¹ Myra Kleinpeter, MD, MPH,² Bonnie R. Pedersen, MPH,¹ Alayna Stepter, BS,¹ John Peabody, MD, DTM&H, PhD, FACP^{3,4}

¹Department of Medicine, Section of General Internal Medicine and Geriatrics, Tulane University Health Sciences Center, New Orleans, La, USA; ²Department of Medicine, Section of Nephrology, Tulane University Health Sciences Center, New Orleans, La, USA; ³Institute for Global Health and San Francisco Veterans Affairs Medical Center, University of California San Francisco, San Francisco, Calif, USA;

⁴Amgen, Thousand Oaks Calif, USA.

BACKGROUND: Black women have a disproportionately higher incidence of cardiovascular disease mortality than other groups and the reason for this health disparity is incompletely understood. Underestimation of personal cardiac risk may play a role.

OBJECTIVE: We investigated the personal characteristics associated with underestimating cardiovascular disease in black women.

DESIGN, SETTING, PARTICIPANTS: Trained surveyors interviewed 128 black women during the baseline evaluation for a randomized controlled trial in an urban, academic continuity clinic affiliated with a public hospital system. They provided information on the presence of cardiac risk factors and demographic and psychosocial characteristics. These self-report data were supplemented with medical record abstraction for weight.

MEASUREMENTS AND MAIN RESULTS: The main outcome measure was the accurate perception of cardiac risk. Objective risk was determined by a simple count of major cardiac risk factors and perceived risk by respondent's answer to a survey question about personal cardiac risk. The burden of cardiac risk factors was high in this population: 77% were obese; 72% had hypertension; 48% had high cholesterol; 49% had a family history of heart disease; 31% had diabetes, and 22% currently used tobacco. Seventy-nine percent had 3 or more cardiac risk factors. Among those with 3 or more risk factors ("high risk"), 63% did not perceive themselves to be at risk for heart disease. Among all patients, objective and perceived cardiac risk was poorly correlated ($\kappa=0.026$). In a multivariable model, increased perceived personal stress and lower income were significant correlates of underestimating cardiac risk.

CONCLUSIONS: Urban, disadvantaged black women in this study had many cardiac risk factors, yet routinely underestimated their risk of heart disease. We found that the strongest correlates of underestimation were perceived stress and lower personal income.

KEY WORDS: women; cardiac risk factors; perceived risk; minority; stress.

DOI: 10.1111/j.1525-1497.2005.0252.x

J GEN INTERN MED 2005; 20:1127-1131.

Cardiovascular disease is the leading cause of death for women, and substantial variation exists in cardiovascular disease treatment and mortality across racial and socioeconomic lines.^{1,2} In particular, black women have a disproportionately higher incidence of cardiovascular disease mortality than other groups.³ The reason for this health dis-

parity is incompletely understood. Several explanatory factors likely exist. First, there are disparities in the primary and secondary treatment of cardiac disease as well as in the prevention and reduction of associated risk factors.^{2,4-7} Second, black women have a higher prevalence of individual cardiac risk factors than other groups. This includes the traditional risks such as family history, hypertension, diabetes, dyslipidemia, obesity, and physical inactivity,^{8,9} and nontraditional risk factors such as stress.¹⁰⁻¹² Third, black women, like most women, have a poor understanding of the importance of cardiovascular disease as a major health threat. Furthermore, most black women, even those who are at high risk for cardiovascular disease, have a poor understanding of risk factors for heart disease.¹³⁻¹⁷

A lack of awareness of cardiac risk factors translates into an underestimation of personal cardiac risk factors and subsequent disease.¹⁸ Such underestimation of risk for heart disease likely inhibits preventive behaviors such as improving dietary habits, activity levels, or decreasing tobacco use.¹³ This study investigated whether high-risk black women accurately perceive their global risk of heart disease and explored the personal characteristics associated with underestimation of that risk.

METHODS

Design

Data for this study were taken from the baseline, cross-sectional information collected on patients enrolled in a larger, randomized controlled educational intervention study. The focus of that study was to improve patient understanding of their personal risk for cardiovascular disease. The intervention consisted of small group and individual discussions between a health care provider and patients about their cardiovascular risk. The Institutional Human Subjects Committee at Tulane University Health Sciences Center approved the data collection procedures.

Setting and Population

This analysis included the subsample of all 128 black women from the total of 199 individuals who participated in the randomized trial. All participants were identified from those presenting for care at an urban continuity clinic in metropolitan New Orleans over a 4-month period. The clinic is an internal medicine practice that is part of a large public hospital system

Presented at the 2004 Southern Society of General Internal Medicine Regional Meeting, February 13, 2004, New Orleans, La.

The authors have no conflict of interest to declare for this article or this research.

Address correspondence and requests for reprints to Dr. DeSalvo: Section of General Internal Medicine and Geriatrics, Tulane University Health Sciences Center, 1430 Tulane Ave., SL-16, New Orleans, LA 70112 (e-mail: kdesalv@tulane.edu).

Received for publication July 25, 2005

and in revised form August 2, 2005

Accepted for publication August 2, 2005

serving a low-income population that is primarily middle-aged, female (75%), and black (75%). The clinic site is designated as a federal Health Manpower Shortage Area, indicating that the population is underserved with respect to health services. Direct, continuity medical care is provided by faculty physicians with clinical appointments at 1 of 2 area medical schools. Patients were eligible for participation if they were over the age of 18, enrolled in the continuity clinic, spoke English as a primary language, and consented to participation. There were no exclusions based upon race/ethnicity, gender, or comorbidity.

Data Collection

Trained surveyors administered a multipart survey to the study population. The items measured included demographic, socioeconomic, medical history, and psychosocial variables. The participant's clinic notes were also abstracted to obtain weight. Demographic information collected included age and gender. Socioeconomic variables measured were race/ethnicity, income, educational level, and current employment status. The survey instrument included self-reported history of chronic conditions and the major cardiac risk factors (hypertension, diabetes, high cholesterol, and smoking history). Sample questions included, "Do you smoke?" and "Has a doctor ever told you that you have diabetes?" A complete list of the questions used to assess cardiac risk can be found in Appendix A (available online).

In focus groups and in-depth interviews at our own institution, black women consistently identified stress as a risk factor for cardiac disease and its associated risk factors, even when they were unable to name other, more common risk factors.^{19–21} Therefore, we measured stress on our survey instrument with the single item, "I feel stressed dealing with the problems of life." Respondents were asked to select from 6 responses on a Likert-type scale that included "very strongly agree," "strongly agree," "agree," "disagree," "strongly disagree," and "very strongly disagree." For purposes of analysis, responses to this question were collapsed into 2 categories: "agree" and "disagree."

We asked participants to rate their perceived risk for cardiac disease. The question wording was: "What do you think your risk for heart disease is?" with response options of: "low," "moderate," "high," or "very high." For analytic purposes, the original "high" and "very high" response options were collapsed into a single category ("high") and "low" and "moderate" were collapsed into a single category ("low").

Analysis

We calculated objective cardiac risk based on a simple count of established cardiovascular risk factors which has previously been demonstrated to predict long-term outcomes.^{22–24} These included: hypertension, diabetes, high cholesterol, smoking, family history, and obesity. Each of the cardiac risk factors was derived from self-report, except for obesity, which was considered present if the calculated body mass index was ≥ 30 as derived from self-reported height and chart-abstracted weight. Patients were considered "high" risk if they had 3 or more of these cardiac risk factors.

The correspondence between objective and perceived cardiac risk was assessed with a κ statistic. In women with an "objective" high risk for cardiac disease (3 or more risk factors), we created a dichotomous variable representing whether they did or did not perceive their cardiac risk to be high. "Underestimators" were those women who perceived themselves to be at "low" risk, but were actually at high risk (i.e., had 3 or more cardiac risk factors).

Next, we developed a logistic regression model that was adjusted for age and socioeconomic status (income) to identify characteristics that predicted patients who underestimated their objective cardiac risk level. The outcome of interest was a dichotomous variable representing those at high risk who perceived themselves to be at low risk ("underestimators") or all others. Potential predictors of underestimation of cardiac risk level included in the model were age and income both modeled as continuous variables. Traditional cardiac risk factors including obesity, hypertension, diabetes, hyperlipidemia, family history, and smoking history were forced into the model. We also included perceived stress, as measured by our self-reported measure.

We performed 2 sensitivity analyses by repeating the regression analysis on a sample excluding women with known cardiovascular disease and on the subgroup of only those women in our sample whose objective cardiac risk was "high."

RESULTS

Respondent Characteristics

Most of the women were middle-aged, poorly educated, and had incomes well below the poverty level (Table 1). The majority was not active in the workforce because they were unemployed, retired, students, or homemakers. Most reported they felt stress dealing with the problems of daily life. The burden of known cardiac risk factors was high in this population (Table 1). The most common cardiac risk factor combination was obesity and hypertension in 61% of respondents. The next most common combination was hypertension and a family history of heart disease followed by obesity and a family history of heart disease.

There was low agreement between objective and perceived cardiac risk (Table 2). Despite the high prevalence of multiple cardiac risk factors, only one third of participants reported themselves to be at high risk of cardiovascular disease. Among patients who actually were at high risk for cardiovascular disease, two thirds underestimated their risk. Those respondents who had underestimated their cardiac risk were older, more often obese, and diagnosed with hypertension and diabetes. However, they were less likely to smoke or have a family history of heart disease. In addition, patients who underestimated their risk for heart disease tended to be less educated and were more often inactive in the workforce. However, none of these relationships was statistically significant. By contrast, patients who perceived themselves as stressed were significantly more likely to underestimate their risk ($P < .001$).

In a multivariable model adjusting for age and including traditional cardiac risk factors, only stress and income were significant predictors of underestimation of cardiac risk. Lower income was correlated with underestimation of cardiovascular risk (odds ratio [OR] 0.71; 95% confidence interval [CI] 0.52, 0.96), as was a reported history of daily stress (OR 4.03; 95%

Table 1. Characteristics of Urban, Black Women Surveyed*

Characteristic	N=128
Mean age, years (range)	56 (35 to 86)
Formal education (%)	
Less than high school	38
High school graduate or GED	39
Some technical, college, or graduate school	23
Income (%)	
Less than \$500 per month	37
\$501 to \$750 per month	29
More than \$750 per month	34
Not active in the workforce (%)	58
Perceived stress (%)	59
Perceived cardiac risk high (%)	30
Objective cardiac risk factors (%)	
Obesity	77
Hypertension	72
Family history	49
High cholesterol	48
Diabetes	31
Current tobacco use	22
Objective cardiac risk (%)	
0 Risk factors	2
1 Risk factor	8
2 Risk factors	12
≥ 3 Risk factors	79

GED, general equivalency diploma; SD, standard deviation; BMI, body mass index. Because of rounding, percents may not add up to 100.

*Based upon data collected at baseline.

[†]Obesity considered present if the BMI was $\geq 30 \text{ kg/m}^2$ using weight abstracted from the clinic note and self-reported height.

[‡]Defined by patient self-report.

CI 1.64, 9.90). Other variables included in this model were age, obesity, a personal history of hypertension, high cholesterol, diabetes, current smoking, and a family history of cardiac disease.

In the analysis excluding women with a history of cardiovascular disease, the results were unchanged. Results were similar in the subsample of women with an objective "high" cardiac risk. The inverse relationship between stress and underestimation of risk strengthened (OR 4.65; 95% CI 1.65,

13.05) and income was no longer statistically significantly associated with underestimation of risk, although the directionality was unchanged.

CONCLUSIONS

We conducted a study to determine the characteristics of black women who underestimated their risk for cardiovascular disease. Despite a high burden and clustering of cardiac risk factors, we found that two thirds of the urban, black women in our study did not perceive themselves at risk for heart disease. Among high-risk women, there was low agreement between women's objective and perceived risk. Self-reported stress strongly correlated with underestimate cardiac risk.

Underestimation of cardiac risk has been demonstrated in other populations. This has been shown to be particularly true for patients with worse health, such as those with a higher burden of chronic disease,²⁵ and among patients with lower socioeconomic status relative to their peers.¹³ In a study by Avis et al.,¹⁴ underestimation of cardiac risk was associated with less education. In their study, they also found that about half of nonminority patients estimated themselves at low risk for heart attack with 40% underestimating their risk.¹⁴ In a Scandinavian study of 26 primary care clinics, investigators found that the majority of patients who perceived themselves at low risk of cardiac disease were actually estimated to be at high risk by their physicians, based on objective data.²⁵ Our report adds to these findings showing disconnect between objective and perceived risk in an underserved, minority population of women.

The epidemiologic relationships between reported or presumed stress and cardiovascular disease have been well documented for decades.^{11,26-28} Although the precise mechanistic relationship between psychosocial issues, such as stress and coronary heart disease, is still open for debate,^{29,30} evidence supports a physiologic link. Stress reduction techniques can improve the treatment of chronic cardiovascular risk factors such as hypertension.^{31,32} Research in minority populations demonstrates a perceived link between stress and heart disease. During in-home interviews of a population-based sample of 601 black, Hispanic, and non-Hispanic white American men and women aged 75 and older, blacks were more than 3 times as likely to attribute heart disease to stress as were non-Hispanic whites.³³ In a study assessing perceptions of risk for cardiac disease among inner-city women, the vast majority of whom were black, nearly all the women named stress as a risk factor for cardiac disease.³⁴ Others have reported similar findings.^{14,17}

Our study did not ask women if they believed that stress was a risk factor for cardiovascular disease. Rather, we asked women if they were stressed, and examined the association between perceived stress and perception of personal cardiovascular disease risk. We found that individuals did not recognize their risk when they felt stressed. This paradoxical finding suggests yet another mechanism by which stress may increase cardiac risk. Women who feel stressed may be less likely to attend to their cardiovascular health, and underestimation of chronic heart disease risk may prevent women from making significant changes in dietary habits, activity levels, and tobacco use to decrease their risk.³⁵ Women who feel stressed may also simply be unable to attend to cardiovascular health, and therefore unwilling to consider it, if stressors are

Table 2. Objective Versus Perceived Cardiac Risk in 128 Urban, Black Women Surveyed (% of respondents)*

Objective Risk [‡]	Perceived Risk [†]	
	Low (%)	High (%)
Low	16	5
High	55	24

* $\kappa = 0.026$.

[†]Perceived risk was defined by their response to the question: "What do you think your risk for heart disease is?" with response options of: "low," "moderate," "high," or "very high." This variable was collapsed into 2 categories with "low" representing those reporting "low" and "moderate" risk and "high" representing those selecting "high" and "very high" risk.

[‡]Objective risk was defined by a simple count of the following risk factors: hypertension, diabetes, high cholesterol, smoking, obesity, and family history. Patients with 3 or more risk factors were defined as high risk. All others were considered "low" risk.

The value in each cell represents the percentage of women whose perceived and cardiac risk fell into those respective categories. Shading indicates the greatest number of respondents.

acute enough or severe enough, as they may be because of conditions of inner city, urban poverty.

Our study has limitations. These respondents were drawn from a single, urban clinic site. Nonetheless, the profile of these patients is similar in demographics and socioeconomic status to other public hospital settings in the inner city. Therefore, this information may be applicable to those caring for similar populations. Further, this cohort represents the beliefs of patients presenting for care, and therefore not the beliefs of a community cohort, potentially limiting the generalizability of the results. However, one would anticipate that a sample of patients who are at high risk for cardiac disease and receiving continuity care would be more aware of their risk for cardiac disease than a community sample, leading to less discordance between objective and perceived risk. We used self-reported risk factors, with the exception of obesity, to assess objective cardiac risk. Under- and overreporting is possible with self-reports³⁶ although such measures are generally known to be accurate.³⁷⁻³⁹ Another potential limitation is the use of a simple count of cardiac risk factors rather than a more accurate prediction index such as the Framingham Index. However, our goal was not to predict precise future risk, but rather look for patterns of cardiac risk underestimation. As a measure of perceived stress, we used a single-item measure. Although others have validated the use of single-item measures for assessing patient self-reports of stress, there may be measurement limitations to this approach.²⁵ We were unable to control for health insurance status and health utilization in our data set. Such covariates may serve as confounders in personal assessment of stress and cardiac risk. Finally, because of the cross-sectional nature of our data, we can only describe the correlation between the participant characteristics and their ability to accurately perceive their cardiovascular risk, not causation.

Attempts to improve the health of underserved groups should use interventions that are sensitive to the health beliefs of the targeted group. Our findings suggest the need for health education interventions and policy strategies that strengthen social support and stress coping. Further research should be performed to investigate how at-risk black women define "stress." It could also examine whether innovative educational programs that include stress reduction techniques would be more effective than focusing purely on traditional cardiac risk factors risk reduction. Additionally, screening patients for perceived stress with even a simple question may help identify those patients who underestimate their cardiac risk.

This study was supported by a grant from Pfizer Inc. The authors would like to thank Mike Jamieson, MD, for his helpful contributions to the development of this project.

REFERENCES

- Heart and Stroke Statistical Update. Dallas, Tex: American Heart Association; 2003.
- Allen J, Scott L, Stewart K, Young DR. Disparities in women's referral to and enrollment in outpatient cardiac rehabilitation. *J Gen Int Med.* 2004;19:747-53.
- Liao Y, Tucker P, Okoro CA, Giles WH, Mokdad AH, Harris VB. A Division of, N.C.f.C.D.P. Community Health, C.f.D.C. Health Promotion-Prevention, REACH 2010 Surveillance for Health Status in Minority Communities—United States, 2001–2002. *MMWR Surveill Summ/CDC.* 2004;53:1–36.
- Steingart RM, Packer M, Hamm P, et al. Sex differences in the management of coronary artery disease. survival and ventricular enlargement investigators. *N Engl J Med.* 1991;325:226–30.
- Ayanian JZ, Epstein AM. Differences in the use of procedures between women and men hospitalized for coronary heart disease. *N Engl J Med.* 1991;325:221–5.
- Ayanian JZ, Udvarhelyi IS, Gatsonis CA, Pashos CL, Epstein AM. Racial differences in the use of revascularization procedures after coronary angiography. *JAMA.* 1993;269:2642–6.
- Epstein AM, Weissman JS, Schneider EC, Gatsonis C, Leape LL, Piana RN. Race and gender disparities in rates of cardiac revascularization: do they reflect appropriate use of procedures or problems in quality of care? *Med Care.* 2003;41:1240–55.
- Potts JL, Thomas J. Traditional coronary risk factors in African Americans. *Am J Med Sci.* 1999;317:189–92.
- Sharma S, Malarcher AM, Giles WH, Myers G. Racial, ethnic and socioeconomic disparities in the clustering of cardiovascular disease risk factors. *Ethnicity Dis.* 2004;14:43–8.
- Linfante AH, Allan R, Smith SC Jr., Mosca L. Psychosocial factors predict coronary heart disease, but what predicts psychosocial risk in women. *J Am Med Womens Assoc.* 2003;58:248–53.
- Marmot MG. Stress, social and cultural variations in heart disease. *J Psychosom Res.* 1983;27:377–84.
- Elliott SJ. Psychosocial stress, women and heart health: a critical review. *Soc Sci Med.* 1995;40:105–15.
- Ford ES, Jones DH. Cardiovascular health knowledge in the United States: findings from the National Health Interview Survey, 1985. *Prev Med.* 1991;20:725–36.
- Avis NE, Smith KW, McKinlay JB. Accuracy of perceptions of heart attack risk: what influences perceptions and can they be changed? *Am J Public Health.* 1989;79:1608–12.
- Poduri AJ, Grisso A. Cardiovascular risk factors in economically disadvantaged women: a study of prevalence and awareness. *J Natl Med Assoc.* 1998;90:531–6.
- Mosca L, Ferris A, Fabunmi R, Robertson RM, American Heart Association. Tracking women's awareness of heart disease: an American Heart Association national study. *Circulation.* 2004;109:573–9.
- Oliver-McNeil SN, Artinian T. Women's perceptions of personal cardiovascular risk and their risk-reducing behaviors. *Am J Crit Care.* 2002;11:221–7.
- Moran MT, Mazzocco VE, Fiscus WG, Koza EP. Coronary heart disease risk assessment. *Am J Prev Med.* 1989;5:330–6.
- Hartnett M, Key I, Loyacano N, Howswell R, DeSalvo KB. Perceived barriers to diabetic eye care: qualitative study of patients and physicians. *Arch Ophthalmol.* 2005;124:1–5.
- Reinhardt K, Block J, DeSalvo KB. Perceptions of heart disease in black women: a qualitative view. *J Invest Med.* 2002;50:117A.
- Reinhardt K, Block J, DeSalvo KB. What black women want: a qualitative study on heart disease. *J Gen Int Med.* 2003;18(suppl 1).
- Yusuf HR, Giles WH, Croft JB, Anda RF, Casper ML. Impact of multiple risk factor profiles on determining cardiovascular disease risk. *Prev Med.* 1998;27:1–9.
- Stamler J, Stamler R, Neaton JD, et al. Low risk-factor profile and long-term cardiovascular and noncardiovascular mortality and life expectancy: findings for 5 large cohorts of young adult and middle-aged men and women. *JAMA.* 1999;282:2012–8.
- Daviglus ML, Liu K, Pirzada A, et al. Favorable cardiovascular risk profile in middle age and health-related quality of life in older age. *Arch Intern Med.* 2003;163:2460–8.
- Bjerrum L, Hamm L, Toft B, Munck A, Kragstrup J. Do general practitioner and patient agree about the risk factors for ischaemic heart disease? *Scand J Primary Health Care.* 2002;20:16–21.
- Bosma H, Stansfeld SA, Marmot MG. Job control, personal characteristics, and heart disease. *J Occup Health Psychol.* 1998;3:402–9.
- Greenwood DC, Muir KR, Packham CJ, Madeley RJ. Coronary heart disease: a review of the role of psychosocial stress and social support. *J Public Health Med.* 1996;18:221–31.
- Steptoe A, Kunz-Ebrecht S, Owen N, et al. Influence of socioeconomic status and job control on plasma fibrinogen responses to acute mental stress. *Psychosom Med.* 2003;65:137–44.
- Pashkow FJ. Is stress linked to heart disease? The evidence grows stronger. *Cleveland Clin J Med.* 1999;66:75–7.
- Wahrborg P. Mental stress and ischaemic heart disease: an underestimated connection. *Eur Heart J.* 1998;19(suppl O):O20–3.

31. **Schneider RH, Staggers F, Alexander CN, et al.** A randomised controlled trial of stress reduction for hypertension in older African Americans. *Hypertension*. 1995;26:820-7.
32. **Linden W, Lenz J, Con A.** Individualized stress management for primary hypertension: a randomized trial. *Arch Int Med*. 2001;161:1071-80.
33. **Goodwin JS, Black SA, Satish S.** Aging versus disease: the opinions of older black, Hispanic, and non-Hispanic white Americans about the causes and treatment of common medical conditions. *J Am Geriatr Soc*. 1999;47:973-9.
34. **Covington JP, Grisso JA.** Assessing cardiovascular disease risk in women: a cultural approach. *J Natl Med Assoc*. 2001;93:430-5.
35. **Carlsson CM, Stein JH.** Cardiovascular disease and the aging woman: overcoming barriers to lifestyle changes. *Curr Womens Health Rep*. 2002;10:366-72.
36. **St Sauver JL, Hagen PT, Cha SS, et al.** Agreement between patient reports of cardiovascular disease and patient medical records. *Mayo Clin Proc*. 2005;80:203-10.
37. **Peabody J, Luck J, Jain S, Bertenthal D, Glassman P.** Assessing the accuracy of administrative data in health information systems. *Med Care*. 2004;42:1066-72.
38. **Okura Y, Urban LH, Mahoney DW, Jacobsen SJ, Rodeheffer RJ.** Agreement between self-report questionnaires and medical record data was substantial for diabetes, hypertension, myocardial infarction and stroke but not for heart failure. *J Clin Epidemiol*. 2004;57:1096-103.
39. **Murabito JM, Nam BH, D'Agostino RB Sr., Lloyd-Jones DM, O'Donnell CJ, Wilson PW.** Accuracy of offspring reports of parental cardiovascular disease history: the Framingham Offspring Study. *Ann Intern Med*. 2004;140:434-40.

Supplementary Material

The following supplementary material is available for this article online at: www.blackwell-synergy.com

Appendix A. Cardiac Risk Factor Questionnaire.

Dear SGIM Members,

Planning for the 2007 SGIM Meeting in Toronto, Canada is in its early stages. We are interested in hearing from those SGIM members that have an interest in being on the 2007 SGIM Program Committee. If you are interested, please send us a brief email that describes the aspect of the meeting that interests you and your past experiences that would contribute to this role. We look forward to hearing about your ideas for any innovations that you would like to bring to the meeting. We encourage ideas to enhance our members' experiences with workshops and precourses as well as attending abstract/vignette and innovation presentations. There are many other roles on the program committee and we welcome participation from a broad spectrum of SGIM members.

Sincerely,

Marilyn M. Schapira Chair 2007 Program Committee
mschap@mcw.edu

Arthur Gomez Co-Chair 2007 Program Committee
art.gomez@med.va.gov