



Alliance for Academic Internal Medicine

Association of Professors of Medicine  
 Association of Program Directors in Internal Medicine  
 Association of Specialty Professors  
 Clerkship Directors in Internal Medicine  
 Administrators of Internal Medicine

## AAIM Perspectives

AAIM is the largest academically focused specialty organization representing departments of internal medicine at medical schools and teaching hospitals in the United States and Canada. As a consortium of five organizations, AAIM represents department chairs and chiefs; clerkship, residency, and fellowship program directors; division chiefs; and academic and business administrators as well as other faculty and staff in departments of internal medicine and their divisions.

# Trends in United States Physician Work Hours and Career Satisfaction



Andrea S. Christopher, MD, C. Scott Smith, MD, Rick Tivis, MPH, Andrew P. Wilper, MD, MPH

Department of Medicine, Boise Veterans Affairs Medical Center, Boise, Idaho.

Physician career satisfaction has the potential to affect the future of medicine in many ways. Dissatisfied physicians are more likely to cut back on hours and shorten the duration of their medical career, whether to retire early or pursue careers outside of medicine.<sup>1</sup> Career satisfaction predicts whether physicians will advise medical students to enter their specialty.<sup>2</sup> Multiple projections predict a drastic shortage of primary care providers within the next 20 years.<sup>3-5</sup> To bolster the primary care physician work force, it is imperative to identify factors that limit career satisfaction. If policymakers can address those factors, it increases the likelihood that medical students and residents choose primary care fields.

Prior studies demonstrate that physician satisfaction remained largely stable over the past 20 years.<sup>6,7</sup> The constantly evolving US health care system has resulted in changes in the roles and responsibilities of physicians during this time, including changes in work hours and the distribution of the daily work load. Excluding changes in resident work hours, recent studies demonstrate decreasing physician work hours. Using US census data, Staiger et al<sup>8</sup> report a 5.7% decrease in work hours nationwide from 1976 to 2008. More

substantial decreases have been noted in studies at the state level.<sup>9</sup> However, prior studies have not examined the differences between primary care and subspecialty providers with respect to changing work hours or types of duty. Very few recent data analyze the relationship between work hours and career satisfaction among US physicians. In this study, we aimed to assess trends in work hours and predictors of career satisfaction for both primary care and subspecialty physicians using the nationally representative Community Tracking Survey.

## METHODS

### Data Source

The Community Tracking Study Physician Survey (CTSPS) is a publicly available data set generated from telephone surveys to a nationally representative sample of physicians. Administered by the Centers for Studying Health System Change,<sup>10-13</sup> these surveys target nonfederal and nonresident physicians who spent at least 20 hours per week in direct patient care. Survey content included physician demographics, patient population, practice environment, career satisfaction, and physician time allocation. The first 4 iterations of CTSPS were used for this study, namely 1996-1997 (12,385 respondents, 65% response rate), 1998-1999 (12,280 respondents, 61% response rate), 2000-2001 (12,389 respondents, 59% response rate), and 2004-2005 (6628 respondents, response rate 52%). No CTSPS was performed for the 2002-2003 period. The sample includes physicians from all specialties, including primary care-specific fields such as family practice, general practice, general internal medicine, internal

**Funding:** This research was supported by a grant from the Mountain States Tumor and Medical Research Institute.

**Conflict of Interest:** None.

**Authorship:** All authors had access to the data and a role in writing the manuscript.

Requests for reprints should be addressed to Andrea S. Christopher, MD, Department of Medicine, Boise Veterans Affairs Medical Center, 500 W. Fort Street, #111, Boise, ID 83702.

E-mail address: [A.S.Christopher@outlook.com](mailto:A.S.Christopher@outlook.com)

medicine/pediatrics, pediatrics, and geriatrics. CTSPS also surveyed physicians in nonprimary care specialties including medicine and pediatric subspecialties, obstetrics/gynecology, and surgical specialties. Given lack of direct patient care, specialties such as radiology and pathology were excluded. Primary care physicians were identified based on self-designation as such in the survey.

The Health Tracking Physician Survey (4720 respondents) is the 2008 successor survey to CTSPS.<sup>14</sup> However, it differs from CTSPS by using a mailed questionnaire with changes in the wording of questions and used different methodology to derive its nationally representative sample. Due to these significant changes, it was not employed for this study.

We analyzed each survey cycle independently and then concatenated files to derive the cohort sample. Changes in demographics were examined using Rao-Scott chi-squared tests adjusted for the survey design. CTSPS provides weights that allow calculation of national estimates. Means and proportions were weighted to arrive at national estimates. To more closely examine the changing perceptions of satisfaction within a cohort, individuals were identified that had participated in all 4 years of the study (ie, 1996-1997, 1998-1999, 2001-2002, and 2004-2005). These individuals were included in the repeated-measure analyses examining differences across years ( $n = 1928$ ) for all subsequent analyses. Analyses were performed using SAS 9.1 (Cary, NC) statistical software survey procedures to account for the complex survey design.

### Quantifying Physician Work Hours

CTSPS defined work hours as “hours spent in medically relevant work,” which was evaluated by the question “During your last complete week of work, approximately how many hours did you spend in all medically related activities? Please include all time spent in administrative tasks, professional activities and direct patient care. Exclude time on call when not actually working.” The distribution of work hours was then further divided into hours spent in direct patient care and charity care. Time spent in direct patient care was evaluated by the question: “Of these [reported] hours, how many did you spend in direct patient care activities?” Time spent in charity care was measured by asking: “During the last month, how many hours, if any, did you spend providing charity care?”<sup>10-13</sup>

Responses were quantified through analysis of variance tests for changes in work hours over time.

### Evaluating Physician Career Satisfaction

Career satisfaction was evaluated by CTSPS with the question: “Thinking very generally about your satisfaction with your overall career in medicine, would you say that you are currently very dissatisfied, somewhat dissatisfied, neither satisfied nor dissatisfied, somewhat satisfied, or very satisfied?” Responses were reported as a Likert scale of 1 to 5, with 3 representing “neither satisfied or dissatisfied.”<sup>10-13</sup> Physicians who reported being “somewhat satisfied” or “very satisfied” were combined in the definition of being satisfied with a career as a physician. Responses were quantified through chi-squared tests to evaluate for changes in career satisfaction over time.

### PERSPECTIVES VIEWPOINTS

- US primary care and subspecialty physicians report working fewer hours and decreasing career satisfaction from 1997 to 2005.
- This study also shows that decreased work hours are correlated independently with higher career satisfaction.
- With the anticipated shortage of primary care providers, it is important to identify modifiable factors to promote growth of the primary care workforce. Our study suggests that decreasing physician work hours may help increase physician career satisfaction.

### Variables Affecting Career Satisfaction

We examined the relationship between physician work hours and career satisfaction via 2 separate approaches. The first approach was developed given concerns about outlier responses in time variables skewing the analysis. The population sample was divided to quartiles for each measure of hours worked, with the middle quartiles combined. Then the percentage of physicians reporting career satisfaction, specifically, being “somewhat satisfied” or “very satisfied” on the survey instrument, was quantified for each quartile of the various measures of work hours.

For the second approach, we developed a multivariate logistic regression model to examine the relationship between work hours and career satisfaction. We controlled for major demographic variables: age, sex, race, country of medical education, self-designation as primary care provider, type of practice, self-employment status, and region of practice in the US.

### Institutional Review Board Approval

The institutional review board of the Puget Sound Veterans Affairs Medical Center approved this study. Additionally, the Inter-University Consortium for Political and Social Research, the organization that manages the CTSPS data sets, approved the study and provided access to files containing variables restricted from public viewing. Funding for this project was provided by a grant from the Mountain States Tumor

and Medical Research Institute. This material is the result of work supported by resources from the Boise Veterans Affairs Medical Center, Boise, Idaho.

## RESULTS

The complete physician sample demographic characteristics are presented in **Table 1**. During the study period, the physician population aged significantly ( $\chi^2[6] = 151.2, P < .0001$ ). The calculated mean age

of physicians increased from 48.5 years (95% confidence interval [CI], 48.3-48.7) in the 1996-1997 survey to 50.0 years (95% CI, 49.6-50.3) in 2004-2005. Over the same period, we document an increase in the proportion of female physicians from 17.6% in 1996-1997 to 25.0% in 2004-2005 ( $\chi^2[3] = 84.3, P < .0001$ ). Surveyed physicians also reported decreasing self-employment (including full and partial ownership), from 61.0% in 1996-1997 to 54.6% in 2004-2005 ( $\chi^2[6] = 54.9, P < .0001$ ), accompanied by

**Table 1** Characteristics of Sample. Demographics of Physician Respondents to Each Survey Cycle of the Community Tracking Study Physician Survey (Total Sample N = 42,911)

Characteristic	1996-1997	1998-1999	2000-2001	2004-2005	P-Value*
Age					<.0001
<45 years	45.0%	44.1%	39.7%	34.9%	
46-65 years	47.0%	50.1%	53.7%	57.1%	
>65 years	8.1%	5.7%	6.5%	7.9%	
Percent female	18.0%	20.9%	23.6%	25.2%	<.0001
Race/ethnicity					.04
White	Not available	81.4%	80.2%	78.1%	
Black		3.5%	3.6%	4.3%	
Native American/Alaska		0.3%	0.4%	0.4%	
Asian/Pacific Islander		11.7%	12.3%	13.6%	
Other		3.1%	3.5%	3.7%	
Medical training					
US graduate	80.5%	78.8%	78.8%	78.0%	.0441
International graduate	19.5%	21.2%	21.2%	22.0%	
MD	93.0%	93.4%	92.8%	92.2%	.1302
DO	7.0%	6.6%	7.2%	7.8%	
Years in practice					<.0001
1 year	0.6%	0.5%	0.1%	0.5%	
2-10	33.9%	35.2%	33.1%	30.8%	
>10	65.5%	64.3%	66.8%	68.7%	
Specialty					
Family medicine/General practitioner	17.6%	16.7%	17.0%	16.6%	<.0001
Pediatrics	8.2%	8.5%	7.8%	8.3%	
General Internal Medicine	12.5%	12.7%	14.3%	11.8%	
Medical specialty	25.2%	27.9%	29.4%	30.9%	
Surgical specialty	22.4%	20.7%	18.8%	18.9%	
Psychiatry	7.6%	6.9%	6.5%	6.7%	
OB/GYN	6.5%	6.5%	6.3%	6.8%	
Primary care	38.8%	38.5%	39.8%	36.7%	.0115
Place of practice					.0281
Hospital	10.7%	12.6%	12.0%	12.0%	
Nonhospital	89.3%	87.4%	88.0%	88.0%	
Employment					<.0001
Self-employed	37.0%	33.2%	31.9%	31.2%	
Partner	24.6%	23.5%	24.0%	23.1%	
Non-self-employed	38.4%	43.3%	44.1%	45.6%	
Region of the country					.0755
Region 1 — Northeast	23.6%	23.8%	24.1%	21.9%	
Region 2 — Midwest	20.8%	19.8%	19.3%	19.4%	
Region 3 — South	34.0%	35.1%	35.4%	35.8%	
Region 4 — West	21.6%	21.3%	21.2%	22.9%	
Accepting Medicaid or Medicare patients					
Medicare	89.9%	89.1%	88.8%	88.2%	Medicare .05
Medicaid	87.1%	86.8%	85.4%	85.4%	Medicaid .02

\*P-value Rao-Scott  $\chi^2$  testing difference in cohort from 1996-1997 to 2004-2005.

an increase in non-self-employed status from 38.0% in 1996-1997 to 45.4% in 2004-2005.

### Physician Work Hours

We present changes in measures of physician work hours in **Table 2**. There was no significant trend for either primary or nonprimary care physicians in weeks per year practicing medicine. There was a decrease in the mean hours per week spent in all medically related activities, which include both direct patient care and charity care responsibilities. For primary care physicians, hours spent in medically related activities decreased from 55.0 hours (95% CI, 54.4-55.6) in 1996-1997 to 54.1 hours (95% CI, 53.6-54.6) in 2004-2005 ( $P = .0004$ ). For nonprimary care providers, hours spent in medically related activities decreased from 57.0 hours (95% CI, 56.5-57.5) in 1996-1997 to 51.1 hours (95% CI, 50.5-51.7) in 2004-2005 ( $P = .0015$ ).

Time in direct patient care demonstrated a significant trend only for nonprimary care physicians over the study period. Hours per week spent in direct patient care increased for nonprimary care physicians from 45.7 hours (95% CI, 45.2-46.2) in 1996-1997 to 46.5 hours (95% CI, 46.0-47.0) in 2004-2005 ( $P = .0072$ ). Time spent in charity care also demonstrated a significant change only for nonprimary care providers. Hours per week spent in charity care decreased by 11.8% for nonprimary care physicians from 9.3 hours (95% CI, 8.8-9.8) in 1996-1997 to 8.2 hours (95% CI, 7.7-8.7) in 2004-2005 ( $P = .05$ ).

### Predictors of Career Satisfaction

During the study period, there was a statistically significant decrease in career satisfaction ( $\chi^2[12] = 50.5$ ,  $P = .0026$ ) for all physicians, from 86.60% of

physicians in 1996-1997 reporting being “somewhat satisfied” or “very satisfied” to 84.70% in 2004-2005 (**Table 3**). This change was significant only for nonprimary care providers in our stratified analysis.

We found that physicians in the lowest quartile of work hours reported highest career satisfaction, as demonstrated in **Table 4**. Physicians in the lowest quartile of weeks worked per year reported highest satisfaction for all rounds of the survey. Additionally, physicians in the lowest quartile of hours worked per week in all medically relevant activities, as well as in hours worked per week in direct patient care, reported higher career satisfaction.

In multivariate analysis controlling for demographics, increased career satisfaction was associated with decreased number of weeks worked per year (odds ratio 0.982; 95% CI, 0.973-0.992) and decreased hours spent in all medically relevant activities (odds ratio 0.990; 95% CI, 0.988-0.993).

### DISCUSSION

Our study demonstrates decreasing work hours among both primary care and subspecialty physicians. The 1.6% decrease for primary care physicians and 10.4% decrease for nonprimary care physicians in work hours are consistent with prior studies.<sup>8,9</sup> These data confirm the change in work hours for both primary care and subspecialty physicians, though it is more pronounced for nonprimary care physicians. Our study also shows a small, but statistically significant, relationship between physician work hours and career satisfaction. Decrease in work hours appears to be correlated with increasing career satisfaction.

Although overall work hours decreased, time spent in direct patient care increased for nonprimary care providers. This increase may indicate that administrative

**Table 2** Trends in Physician Work Hours

Characteristic	1996-1997	1998-1999	2000-2001	2004-2005	P-Value*
Weeks per year practicing medicine					
Primary care	47.2 (0.2)	47.8 (0.1)	47.6 (0.2)	47.2 (0.4)	.06
Non primary care	47.5 (0.2)	47.6 (0.1)	47.4 (0.1)	47.2 (0.1)	.51
Hours per week in medical related activity					
Primary care	55.0 (0.6)	54.2 (0.5)	52.9 (0.5)	54.1 (0.5)	.0004
Non primary care	57.0 (0.5)	55.7 (0.5)	55.4 (0.5)	51.1 (0.6)	.0015
Hours per week in direct patient care					
Primary care	44.7 (0.5)	44.6 (0.5)	45.5 (0.5)	44.2 (0.7)	.39
Non primary care	45.7 (0.5)	45.0 (0.5)	47.5 (0.5)	46.5 (0.5)	.0072
Hours per week in charity work					
Primary care	6.0 (0.4)	6.1 (0.4)	6.0 (0.5)	5.4 (0.4)	.18
Non primary care	9.3 (0.5)	9.7 (0.7)	7.6 (0.4)	8.2 (0.5)	.05

Mean values (with SE) are reported for various measures of physician work hours for the different survey cycles of the Community Tracking Study Physician Survey (subsample participating in all 4 surveys, N = 1928).

\*P-value from analysis of variance testing changes over time by primary care physician status and adjusted for complex survey design and major demographic covariates.

**Table 3** Physician Career Satisfaction. Percent of Physicians Reporting Overall Career Satisfaction by Survey Cycle (Subsample Participating in All 4 Surveys N = 1928)

Survey Cycle	1996-1997	1998-1999	2000-2001	2004-2005	P-Value*
	Percent (95% CL)	Percent (95% CL)	Percent (95% CL)	Percent (95% CL)	
All physicians	86.60% (84.81-88.39)	81.75% (79.70-83.80)	82.20% (80.12-84.28)	84.70% (82.73-86.66)	.0026
Primary care	87.03% (84.64-89.43)	84.69% (82.01-87.38)	81.83% (78.85-84.81)	83.65% (80.13-87.17)	.13
Non primary care	86.39% (84.00-88.79)	80.55% (77.88-83.22)	82.32% (79.74-84.91)	85.23% (82.88-87.59)	.0059

CL = confidence limits.

\*P-value Rao-Scott  $\chi^2$  testing difference in cohort from 1996-1997 to 2004-2005.

duties decreased. Reduced administrative work might have resulted from the decreased physician self-employment observed.<sup>15</sup> No recent data confirm that increased numbers of nurse practitioners and physician assistants have decreased physician administrative duties.<sup>16</sup> The decrease in time spent in charity care may partially explain the overall decrease in work hours. However, the decrease in total work hours was greater than the decrease in charity care. As noted, CTSPS did not include a specific question about administrative duties. However, recent data suggest that time spent by

US physicians on administrative tasks is substantially greater than their Canadian counterparts.<sup>17</sup>

Given the anticipated shortage of primary care providers in the US, identifying modifiable factors to promote growth of the primary care workforce is essential. Many factors that affect physician career satisfaction have previously been identified. These factors include perceived clinical autonomy, control of work schedule, job demand, income and incentives, access to health information technology, foreign training, and peer collegiality.<sup>18-22</sup> Top performing

**Table 4** Relationship between Work Hours and Career Satisfaction

Survey Year	Population Quartiles for Measures of Work Time			Rao $\chi^2$ DF(2)	P-Value
	<25 <sup>th</sup> Percentile	25 <sup>th</sup> -75 <sup>th</sup> Percentile	>75 <sup>th</sup> Percentile		
Weeks per year practicing medicine					
1996-1997	84.5	84.1	77.3	55.5	<.0001
1998-1999	83.5	82.0	76.4	30.7	<.0001
2000-2001	83.7	83.5	77.5	22.5	<.0001
2004-2005	88.3	86.7	79.5	21.1	<.0001
Hours per week in all medically relevant work					
1996-1997	82.2	82.9	82.1	0.597	.7418
1998-1999	81.4	83.4	79.3	11.9	.0026
2000-2001	83.7	84.1	79.3	17.5	.0002
2004-2005	89.8	86.7	81.6	25.7	<.0001
Hours per week in direct patient care					
1996-1997	81.6	82.7	82.5	1.1	.5737
1998-1999	81.4	82.2	78.7	8.9	.0119
2000-2001	83.7	83.0	79.2	12.8	.0017
2004-2005	88.2	87.1	80.9	17.6	.0002
Hours per week in charity care					
1996-1997	82.7	84.2	79.8	22.3	<.0001
1998-1999	79.7	83.2	79.3	14.0	.0009
2000-2001	80.4	83.6	81.0	7.1	.0284
2004-2005	86.0	85.8	84.8	0.4	.8142

The population sample was divided into quartiles for each measure of time worked, with the middle quartiles combined. The percentage of physicians reporting career satisfaction, specifically selecting "somewhat satisfied" or "very satisfied" on the survey instrument, is reported for each quartile.

medical graduates are increasingly entering subspecialties as these are identified as lifestyle friendly, based on availability of leisure time, time with family, and predictable work hours.<sup>23,24</sup> Therefore, to attract medical students into primary care fields, the factors affecting career satisfaction must be addressed. Improving physician career satisfaction also has important implications on the health of the US population. While physician satisfaction has not been directly associated with measurable changes in quality of care,<sup>25</sup> the availability of primary care providers has been associated with improved outcomes in patients.<sup>26,27</sup>

Our study has limitations. As a longitudinal cohort study, we tested for changes in a cohort of physicians. Our study may be biased if work hours predicted nonresponse, that is, if busier physicians were less likely to participate in the survey. This factor may skew our results toward the observed trend of decreasing work hours. While we controlled for self-employment in the logistic regression predicting career satisfaction, future study could determine whether decreasing self-employment status may have affected the trends observed in work hours. Because we were unable to analyze time in administrative tasks, we cannot explicitly account for which component of physician commitments is responsible for the decrease in work hours. Also, the work hours documented were derived from participant recall rather than documented work hours and therefore is at risk for recall bias. Additionally, unmeasured confounders may affect the relationship between work hours and career satisfaction. Future analyses could evaluate the influence of gender on the relationship between work hours and career satisfaction. The Women Physicians Health Study suggests that nearly one third of female providers consider changing specialty or would choose not to become a physician again despite similar projections of career satisfaction.<sup>28</sup> Finally, our findings suggest a somewhat paradoxical conclusion. Decreased work hours are weakly associated with increased career satisfaction. Meanwhile, we document decreases in both work hours and satisfaction. One possible explanation for these results could be a threshold effect, that is, only once working less than a specific number of hours does satisfaction increase. Alternatively, unobserved confounders could be driving down both hours and satisfaction.

Changes to the US health care system propose an increasing emphasis on primary care. Meanwhile, estimates project a deficit of primary care providers. Maintaining or increasing physician career satisfaction, especially in the primary care specialties, is gaining relevance for the future of the health care workforce. Our study suggests that one avenue toward bolstering the primary care work force may be a focus on decreasing physician work hours to increase physician career satisfaction.

## References

- Landon BE, Reschovsky JD, Pham HH, Blumenthal D. Leaving medicine: the consequences of physician dissatisfaction. *Med Care*. 2006;44(3):234-242.
- Wetterneck TB, Linzer M, McMurray JE, et al. Worklife and satisfaction of general internists. *Arch Intern Med*. 2010;162:649-656.
- Petterson SM, Liaw WR, Phillips WR Jr, Rabin DL, Myers DS, Bazemore AW. Projecting US primary care physician workforce needs: 2010-2025. *Ann Fam Med*. 2012;10:302-309.
- Association of American Medical Colleges. The impact of health care reform on the future supply and demand for physicians updated projections through 2025. June 2010. Available at: [https://www.aamc.org/download/158076/data/updated\\_projections\\_through\\_2025.pdf](https://www.aamc.org/download/158076/data/updated_projections_through_2025.pdf). Accessed April 26, 2024.
- Brotherton S, Etzel SI. Graduate medical education, 2007-2008. *JAMA*. 2008;300(10):1228-1243.
- Landon BE, Reschovsky J, Blumenthal D. Changes in career satisfaction among primary care and specialist physicians 1997-2001. *JAMA*. 2003;289(4):442-449.
- Scheurer D, McKean S, Miller J, Wetterneck T. US physician satisfaction: a systematic review. *J Hosp Med*. 2009;4(9):560-568.
- Staiger DO, Auerbach DI, Buerhaus PI. Trends in the work hours of physicians in the United States. *JAMA*. 2010;303(8):747-753.
- Wilper AP, Weppner WG, Smith CS. Changes in Idaho primary care physician clinical work hours, 1996-2009. *JAMA*. 2010;304(13):1443-1445.
- Center for Studying Health System Change. *Community Tracking Study Physician Survey, 1996-1997: ICPSR Version*. Washington, DC: Center for Studying Health System Change; 1997.
- Center for Studying Health System Change. *Community Tracking Study Physician Survey, 1998-1999: ICPSR Version*. Washington, DC: Center for Studying Health System Change; 1999.
- Center for Studying Health System Change. *Community Tracking Study Physician Survey, 2000-2001: ICPSR Version*. Washington, DC: Center for Studying Health System Change; 2001.
- Center for Studying Health System Change. *Community Tracking Study Physician Survey, 2004-2005: ICPSR Version*. Washington, DC: Center for Studying Health System Change; 2005.
- Center for Studying Health System Change. *2008 Health Tracking Physician Survey*. Washington, DC: Center for Studying Health System Change; 2008.
- Glasheen JJ, Misky GJ, Reid MB, Harrison RA, Sharpe B, Auerbach A. Career satisfaction and burnout in academic hospital medicine. *Arch Intern Med*. 2011;171(8):782-785.
- Druss BJ, Marcus SC, Olfson M, Tanielian T, Pincus HA. Trends in care by nonphysician clinicians in the United States. *N Engl J Med*. 2003;348:130-137.
- Katerndahl D, Parchman M, Wood R. Perceived complexity of care, perceived autonomy, and career satisfaction among primary care physicians. *J Am Board Fam Med*. 2009;22(1):24-33.
- Elder KT, Wiltshire JC, Rooks RN, BeLue R, Gary LC. Health information technology and physician career satisfaction. *Pers Health Info Manag*. 2010;C7(1):1-10.
- Chen PG, Curry LA, Bradley EH, Desai MM. Career satisfaction in primary care: a comparison of international and US medical graduates. *J Gen Intern Med*. 2012;27(2):147-152.
- Stoddard JJ, Hargraves JL, Reed M, Vratil A. Managed care, professional autonomy, and income: effects on physician career satisfaction. *J Gen Intern Med*. 2001;16:675-684.
- Grayson MS, Newton DA, Patrick PA, Smith L. Impact of AOA status and perceived lifestyle on career choices of medical graduates. *J Gen Intern Med*. 2011;26(12):1434-1440.

22. Schwartz MD, Durning S, Linzer M, Hauer KE. Changes in medical students' views of internal medicine careers from 1990 to 2007. *Arch Intern Med.* 2011;171(8):744-749.
23. Linzer M, Manwell LB, Williams ES, et al. Working conditions in primary care: physician reactions and care quality. *Ann Intern Med.* 2009;151:28-36.
24. US Department of Health and Human Services. *Healthy People, 2010: Understanding and Improving Health.* 2<sup>nd</sup> ed. Washington, DC: US Government Printing Office; November 2000.
25. Isaacs SL, Jellinek PS, Ray WL. The independent physician—going, going.... *N Engl J Med.* 2009;360(7):655-657.
26. Morra D, Nicholson S, Levinson W, Gans DN, Hammons T, Casalino LP. US physician practices versus Canadians: spending nearly four times as much money interacting with payers. *Health Aff (Millwood).* 2011;30(8):1443-1450.
27. Chang CH, Stukel TA, Flood AB, Goodman AC. Primary care physician workforce and Medicare beneficiaries' health outcomes. *JAMA.* 2011;305(20):2096-2105.
28. Frank E, McMurray JE, Linzer M, Elon L. Career satisfaction of US women physicians. *Arch Intern Med.* 1999;159:1417-1426.