BACKGROUND AND OBJECTIVES: In July 2010, the Accreditation Council for Graduate Medical Education (ACGME) published its proposed duty-hour regulations. We conducted a national online survey to assess current family medicine residents' perceptions of the proposed changes.

METHODS: A 27-question survey was used to assess four ACGME proposal domains: resident supervision, 80-duty-hour week, maximum duty-period length, and maximum frequency of in-hospital duty. Additionally, we surveyed opinions on reasonable weekly work hours, under-reporting practice, and residents' activities during hours off, residents' perceptions of their program's ability to comply with future duty-hour regulations, and their overall satisfactions. Members of the Association of Family Medicine Residency Directors (AFMRD) were invited to send the survey Web link to their residents.

RESULTS: Out of 720 respondents, 30% supported revision of current duty-hour work rules; 58% disagreed with limiting interns' working hours to 16 hours per day; 48% perceived revision of resident supervision favorably; 26% expressed concern about continuing the current 80-duty-hour week rule; 75% supported limiting night duty to six consecutive nights; 83% agreed that reasonable resident weekly work hours should be 60–80 hours; and 18% admitted under-reporting of duty hours. Residents' hours off activities varied. Only 57% believed that their program will be able to implement the new changes effectively. Overall satisfaction with the future duty-hour rules were mixed: very satisfied (7%), satisfied (24%), somewhat satisfied (27%), unsatisfied (23%), and very unsatisfied (18%).

CONCLUSIONS: Support for the proposed ACGME duty-hour regulations was mixed among current family medicine residents. Respondents and residency program directors shared similar concerns about some of the recommended changes.

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comment until August 9, 2010, on the ACGME Web site (http://acgme.org) and will go into effect on July 1, 2011.

Before the new duty-hour rules are enacted, we believed that the ACGME needed to consider the current family medicine residents’ views of the proposed changes and also how current residents perceive the impact of the existing duty-hour regulations on patient care, education/training, and personal life. Thus, in July 2010, we invited US family medicine residency programs to participate in an online survey on the proposed duty-hour recommendations: maximum duty-period length, 80-duty-hour week, resident supervision, maximum frequency of in-hospital duty, and other areas of interest including reasonable weekly work hours, under-reporting actual work hours, resident activities during the hours off between scheduled duty periods, resident perception of their program’s ability to comply with current and future duty-hour regulations, and anticipated overall satisfaction of the new duty-hour regulations. We chose to survey only family medicine residents because (1) they represent a large number of US trainees in medicine and (2) they will be most heavily affected by the ACGME duty-hour proposals because of their complicated rotation/work schedules, emphasis in continuity patient care, diverse program sizes, and various sponsorships (unopposed, partially opposed, and opposed (Table 1, question 3).

Methods

Samples
Between July 26, 2010, and August 6, 2010, we conducted a cross-sectional online survey approved by the Institutional Review Board at San Joaquin General Hospital. All 416 program directors on the e-mail listserve of the AFMRD were invited to participate in the project by sending their residents the survey Web link at SurveyMonkey.com. The survey took about 5 minutes to complete. The program and respondents were entirely anonymous.

Measures
Based on a recent AFMRD survey and the authors’ interest, a 27-question survey (Table 1) was developed and pilot tested for clarity and feedback among 20 family medicine residents at San Joaquin General Hospital. The final survey was uploaded at SurveyMonkey.com where all data were collected.

Analysis
SPSS Version 11.5 was used for all analyses. The Kruskal-Wallis test was chosen to evaluate heterogeneity between subgroups (P values are reported in Table 3). Whenever significant at a 5% level, a Mann-Whitney with Bonferroni corrections was used for post-hoc comparisons—the significant pair-wise differences are reported in the subgroup analysis section by the percentages responding “highly agree” or “agree” to the question analyzed.

Results
A separate survey through the same e-mail listserve found that 86 program directors (21%) actually sent the survey link to a total of 2,103 residents. Only 720 residents completed the online survey. The survey response rate was 34%. The respondents represented about 7% of the current trainees based on the 2010 annual survey of family medicine residency programs (total residents=9,790). The characteristics of the respondents were described according to geographic location, sponsoring institution type, program type, program size, and training level (Table 2).

Familiarity With the New ACGME Duty-hour Proposal
Twenty-eight percent of the respondents self-reported very familiar, 68% reported somewhat familiar, and 3% reported either “never heard of it” or “don’t care.”

Reasonable Weekly Work Hours
Eighty-three percent of the respondents stated that residents should work between 60–80 hours weekly, and 54% reported that their actual work hours were between 60 and 80 hours per week.

Under-reporting Actual Work Hours
Eighteen percent of the respondents admitted to intentional under-reporting of their actual work hours in the last 6 months. Twelve percent would continue to under-report, while 11% would begin to under-report under the new ACGME duty-hour rules.

Need for Revision of Current Duty-hour Regulations
The respondents reported mixed sentiments regarding the need for revising the current duty-hour regulations (30% agreed or strongly agreed, 29% somewhat agreed, and 41% disagreed or strongly disagreed).

ACGME Proposal That Duty Period of Intern Must Not Exceed 16 Hours
Most (58%) disagreed with limiting interns to 16 work hours per day. Those who disagreed perceived that the changes would have a negative impact on continuity of care (82%), commitment to patient care (58%), commitment to personal training (60%), personal and career satisfaction (25%), expectation of future work hours (69%), and other specific comments (26%). Those who agreed believed benefits would include more sleep (54%), increased alertness and less error (80%), better learning due to less fatigue (81%), better mental health (79%), and greater personal and career satisfaction (69%).

ACGME Proposal to Extend Current Duty-hour-80/Week, Average Over 4 Weeks
Responses were split regarding whether the ACGME should continue the current 80-duty-hour week rule (39% agreed that continuing the 80-duty-hour week rule improves
Table 1: ACGME Duty-hour Survey Questionnaire

1. Where is your program located? (West, Midwest, East, or South)
2. What is your program type? (university based, community based with university affiliation, community-based)
3. Is your program unopposed, partially-opposed or opposed? Unopposed (FM is the only program in your institution), Partially opposed (One to two other specialty residency programs present in your institution), Opposed (more than two other specialty residency programs present in your institution)
4. What is your program size? (5-5-5, 6-6-6, 7-7-7, 8-8-8, 9-9-9, or higher)
5. What is your current level of training? (PGY-1, PGY-2, or PGY-3)
6. How familiar are you with the new ACGME duty-hour week proposal? (very familiar, somewhat familiar, never heard of it, or don’t care)
7. What do you think is the reasonable number of hours for residents to work per week? (<40, 40–59, 60–79, 80, or 81 and more)
8. On average, how many hours per week are you currently working? (<40, 40–59, 60–79, 80, or 81 and more)
9. Have you ever intentionally under-reported your actual work hours in the last 6 months? (yes or no)
10. If yes, will you continue to under-report your actual work hours under the new ACGME proposal for duty-hour week? (yes, no, or not sure)
11. If no, will you start to under-report your actual work hours under the new ACGME proposal for duty-hour week? (yes, no, or not sure)
12. Do you agree that a revision of the current duty-hour regulations is needed? (strongly agree, agree, somewhat agree, disagree, or strongly disagree)
13. Do you agree with limiting interns to 16 working hours per day? (strongly agree, agree, somewhat agree, disagree, or strongly disagree)
14. Do you agree that limiting interns to 16 working hours per day will have a negative impact on their education and training? (strongly agree, agree, somewhat agree, disagree, or strongly disagree; please select all that apply)
15. If you agree with limiting interns to 16 hours per day, what would be the perceivable benefits? (sleep more, more alert and less error, learn better because less fatigue, better mental health, greater personal and career satisfaction or other; please select all that apply)
16. In your opinion, will the new ACGME proposal of continuing the 80 duty-hour week improve patient care and safety? (yes, no, or don’t know/undecided)
17. If you disagree that the new ACGME proposal of continuing the 80 duty-hour week will improve patient care and safety, how do you think patient care may suffer? (continuity of care, medical errors, increased length of stay due to staff shortage, premature hospital discharge due to staff shortage, increased inpatient complications or other; please select all applied)
18. Do you agree that the new ACGME proposal of continuing the 80 duty-hour week will lessen your education and learning experience? (strongly agree, agree, somewhat agree, disagree, or strongly disagree)
19. Do you agree that the new ACGME proposal of continuing the 80 duty-hour week will lessen your education and learning experience? (strongly agree, agree, somewhat agree, disagree, or strongly disagree)
20. What do you think about the adequacy of your current level of supervision in your program? (very adequate, adequate, somewhat adequate, somewhat inadequate, or grossly inadequate)
21. The new resident supervision rules will enhance your education and training (level 1: direct supervision; level 2a: indirect supervision, supervising physician on site and available; level 2b: supervising physician available by phone; level 3: oversight and retrospective review); (strongly agree, agree, somewhat agree, disagree, or strongly disagree)
22. The new resident supervision will improve patient safety and care (strongly agree, agree, somewhat agree, disagree, or strongly disagree)
23. Night duty should be limited to no more than six consecutive nights (strongly agree, agree, somewhat agree, disagree, or strongly disagree)
24. During the hours off between scheduled duty periods, what do you usually do? (catch up on my sleep, catch up on my medical records, study/research/scholarly/activity, personal pleasure, family responsibilities, or other)
25. Do you agree that your program in good faith has helped you to adhere to the current duty-hour week regulations? (strongly agree, agree, somewhat agree, disagree, or strongly disagree; please select that apply)
26. Do you agree that your program will be able to implement the new ACGME proposed duty-hour week regulations? (strongly agree, agree, somewhat agree, disagree, or strongly disagree)
27. Overall, will you be satisfied with the new ACGME proposed duty-hour week regulations? (very satisfied, satisfied, somewhat satisfied, unsatisfied, or very unsatisfied)
patient care and safety, 26% disagreed, and 35.6% responded either “Don’t know” or “Undecided”). Those who disagreed perceived a negative impact on continuity of care (57%), increased medical error (55%), increased length of stay due to staff shortage (39%), premature hospital discharge due to staff shortage (26%), increased inpatient complications (40%), and others (19%). However, 57% disagreed that the current 80-duty-hour week rule had a negative impact on their educational and learning experience.

ACGME Proposal of Three Levels of Graded Resident Supervision
A majority (90%) felt that the current level of supervision in their program was either very adequate or adequate. Only half of a percent reported grossly inadequate supervision. Forty-eight percent of the respondents strongly agreed or agreed that the new resident supervision rules will enhance their education and training; however, 14% disagreed and 5% strongly disagreed. Further, 46% strongly agreed or agreed that the new resident supervision rules will improve patient safety and care, while 21% disagreed or strongly disagreed.

ACGME Proposal That Residents Must Not Be Scheduled for More Than 6 Consecutive Nights of Nightly Duty
Thirty-six percent of the respondents strongly agreed and 39% agreed that night duty should be limited to no more than six consecutive nights. Only 4% strongly disagreed, and 10% disagreed with the proposed change.

Resident Activities During the “Hours Off” Between Scheduled Duty Periods
Residents reported using the time for a variety of activities including: catch up with my sleep (86%), catch up with my medical records (55%), study/research/scholarly activity (45%), personal pleasure (64%), family responsibilities (75%), and others (6%).

Resident Perception of Their Program’s Ability to Comply With Current and Future Duty-hour Regulations
Ninety percent believed that their programs were in good faith in helping them to adhere to the current duty-hour regulations, while only 57% believed that their programs would be able to implement the new duty-hour regulations effectively.

Anticipated Overall Satisfaction of the New Duty-hour Regulations
Finally, the respondents’ anticipation of satisfaction with the future duty-hour rules were mixed: very satisfied (7%), satisfied (24%), somewhat satisfied (27%), unsatisfied (23%), and very unsatisfied (18%).

Subgroup Analyses (Table 3)
A Revision of the Current Duty-hour Regulations is Needed. The Eastern and Western programs were significantly more supportive of this statement than the Midwestern ones (39%, 36%, and 23%, respectively.) The “unopposed” programs were less supportive than “partially opposed” and “opposed” (24%, 32%, and 38%, respectively.) University programs were the most supportive, community programs were next in support, and the university-affiliated community programs were the least supportive (48%, 33%, 21% respectively.)

Interns Should be Limited to 16-hour Workday. The Midwestern residency programs showed less support than programs in the West and the East (20%, 34%, and 36%, respectively.) Postgraduate year 1 (PGY-1) residents showed more support than PGY-2 and PGY-3 residents (35%, 24%, and 22%, respectively.) The university-affiliated community programs showed less support than either the university-based or the community-based programs (23%, 33%, and 31%, respectively.) The “opposed” programs showed more support than the “unopposed” (30% to 24%).

The 80-duty-hour Week Will Lessen Your Education and Learning Experience. The PGY-3 residents agreed with the statement more than the PGY-1 residents (30% to 15%), and the university-affiliated

<table>
<thead>
<tr>
<th>Program Location</th>
<th>West Coast 17.1%</th>
<th>Midwest 38.9%</th>
<th>East Coast 24.4%</th>
<th>South 19.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Sponsorship</td>
<td>University based 19.9%</td>
<td>Community based with university affiliation 53.2%</td>
<td>Community based 26.9%</td>
<td></td>
</tr>
<tr>
<td>Program Type</td>
<td>Unopposed 51.7%</td>
<td>Partially opposed 15.3%</td>
<td>Opposed 23.1%</td>
<td></td>
</tr>
<tr>
<td>Program Size</td>
<td>5-5-5 6.7%</td>
<td>6-6-6 27.8%</td>
<td>7-7-7 11.8%</td>
<td>8-8-8 18.7%</td>
</tr>
<tr>
<td>Training Level</td>
<td>PGY-1 35.2%</td>
<td>PGY-2 34.2%</td>
<td>PGY-3 30.7%</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Characteristics of the Respondents

FAMILY MEDICINE
community programs agreed more than the university ones (26% to 15%).

**New Resident Supervision Rules Will Enhance Your Education and Training.** The Eastern programs were more supportive than the Midwest's (61% to 36%). The university-based programs were more supportive than the university-affiliated community programs (53% to 46%). Residents from the “unopposed” programs were less supportive than those from the “partially opposed” programs (44% to 56%).

**New Resident Supervision Rules Will Improve Patient Care and Safety.** Residents from the Midwestern programs were less supportive than those from the East or the West (36%, 59%, and 51%, respectively).

**Night Duty Should Be Limited to No More Than Six Consecutive Nights.** The Eastern programs were more supportive than the Midwestern ones (81% to 71%).

**Overall, Will You Be Satisfied With the New ACGME Proposed Duty-hour-week Regulations?** Western, Eastern, and Southern programs had more supportive responses than the Midwestern ones (29%, 29%, 26%, and 18% respectively). University-based programs were more supportive than community-university-based ones (30% to 23%). Both “partially opposed” and “opposed” were more supportive than “unopposed” (32%, 28%, and 20%, respectively). PGY-1 respondents were more supportive than those at the PGY-2 level (25% to 23%).

**Discussion**

We proposed that residents’ perspectives and opinions are important in the process of developing effective resident duty-hour regulations. Hence, we designed a survey to assess how current family medicine residents perceive the upcoming ACGME duty-hour changes. The opinions of our respondents raise legitimate concerns that the ACGME should not implement its new duty-hour rules proposal without further revision. First, nearly half of the respondents (41%) were not in full agreement that a revision of the current ACGME duty-hour rules is needed. Second, more than 25% of respondents (26%) disagreed with the proposed continuing 80-duty-hour week regulation. These residents were highly concerned that patient care would suffer in the areas of continuity of care (46%), medical errors (56%), increased length of stay (37%), and increased inpatient complications (42%). Third, a majority (58%) disagreed with limiting interns to 16 working hours per day. They expressed their concern about its negative impact on continuity of care (81%), commitment to patient care (58%), commitment to personal training (60%), and expectation of future work hours (68%).

While some may argue that residents’ perceptions are far from reality, a recent study on the mortality among hospitalized Medicare

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**Table 3. Results for Key Questions on ACGME Proposals**

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you agree that a revision of the current duty-hour regulations is needed?</td>
<td>103 (14.5)</td>
<td>110 (15.5)</td>
<td>203 (28.6)</td>
<td>170 (23.9)</td>
<td>124 (17.5)</td>
</tr>
<tr>
<td>Do you agree with limiting interns to 16 working hours per day?</td>
<td>102 (14.3)</td>
<td>92 (12.9)</td>
<td>106 (14.8)</td>
<td>182 (25.5)</td>
<td>232 (32.5)</td>
</tr>
<tr>
<td>Do you agree that the new ACGME proposal of continuing the 80-duty-hour week will lessen your education and learning experience?</td>
<td>77 (11.2)</td>
<td>79 (11.5)</td>
<td>137 (20.0)</td>
<td>307 (44.8)</td>
<td>85 (12.4)</td>
</tr>
<tr>
<td>The new resident supervision rules will enhance your education and training</td>
<td>71 (10.5)</td>
<td>254 (37.5)</td>
<td>228 (33.6)</td>
<td>94 (13.9)</td>
<td>31 (4.6)</td>
</tr>
<tr>
<td>The new resident supervision will improve patient safety and care</td>
<td>82 (11.9)</td>
<td>238 (34.6)</td>
<td>225 (32.7)</td>
<td>116 (16.9)</td>
<td>27 (3.9)</td>
</tr>
<tr>
<td>Night duty should be limited to no more than six consecutive nights</td>
<td>255 (36.4)</td>
<td>270 (38.5)</td>
<td>85 (12.1)</td>
<td>66 (9.4)</td>
<td>25 (3.6)</td>
</tr>
<tr>
<td>Do you agree that your program will be able to implement the new ACGME proposed duty-hour week regulations?</td>
<td>156 (22.2)</td>
<td>245 (34.9)</td>
<td>158 (22.5)</td>
<td>105 (15.0)</td>
<td>38 (5.4)</td>
</tr>
<tr>
<td>Overall, will you be satisfied with the new ACGME proposed duty-hour week regulations?</td>
<td>51 (7.2)</td>
<td>171 (24.2)</td>
<td>193 (27.3)</td>
<td>164 (23.2)</td>
<td>129 (18.2)</td>
</tr>
</tbody>
</table>

(continued on next page)
beneficiaries suggests that our residents’ concerns of duty-hour restrictions on patient care are real and ought to be taken seriously. The authors reported that duty-hour reform was not associated with significant improvement in the mortality for Medicare patients in the first 2 years following the ACGME resident duty-hour reform.6

We consider our study’s findings significant because they echoed similar concerns from two recent surveys conducted among both family medicine residency and national residency program directors. Two thirds or more of family medicine residency directors responded that it would be “difficult” or “very difficult” to implement limiting residents to a 16-hour shift.5 Moreover, 84% of the national resident program directors disagreed with the ACGME’s proposal for a maximum duty period of 16 hours for interns.9 This survey further reported that most residency programs currently lack the policies and plans necessary for compliance with the proposed new requirements.9 Finally, our result also reported that nearly half of residents (43%) believed that their programs would not be able to implement the new duty-hour regulations effectively. Specifically, the under-reporting of actual duty hours by some residents was disturbing. The results indicated that 12% of the respondents will continue to under-report their duty hours, and 11% will begin under-reporting under the new duty-hour rules. With so many respondents in opposition to the changes, it is imperative for the ACGME to reconsider the current proposal.

We emphasize that we are not suggesting that all the proposed changes are neither beneficial nor unfavorable. Indeed our findings indicate that many respondents are supportive of certain regulations, specifically resident supervision and night duty restriction. Most respondents (90%) perceived that the current resident supervision was adequate in their program and also benefits in the new proposed supervision rules. In addition, a majority (75%) also supported limiting night duty to no more than six consecutive nights. These results are consistent with a recent survey that reported that 78% of the national residency program directors agreed with the recommended change in the maximum frequency of in-hospital night duty.6 Nonetheless, while not all changes are perceived unfavorable,

Table 3: Results for Key Questions on ACGME Proposals

<table>
<thead>
<tr>
<th>Subgroup Analyses</th>
<th>Location</th>
<th>Sponsorship</th>
<th>Program Type</th>
<th>Size</th>
<th>Training Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you agree that a revision of the current duty-hour regulations is needed?</td>
<td>0.000†</td>
<td>0.000†</td>
<td>0.000†</td>
<td>0.606</td>
<td>0.083</td>
</tr>
<tr>
<td>Do you agree with limiting interns to 16 working hours per day?</td>
<td>0.000†</td>
<td>0.001†</td>
<td>0.037†</td>
<td>0.376</td>
<td>0.001†</td>
</tr>
<tr>
<td>Do you agree that the new ACGME proposal of continuing the 80 duty-hour week will lessen your education and learning experience?</td>
<td>0.342</td>
<td>0.027†</td>
<td>0.018†</td>
<td>0.827</td>
<td>0.004†</td>
</tr>
<tr>
<td>The new resident supervision rules will enhance your education and training</td>
<td>0.000†</td>
<td>0.018†</td>
<td>0.017†</td>
<td>0.224</td>
<td>0.140</td>
</tr>
<tr>
<td>The new resident supervision will improve patient safety and care</td>
<td>0.000†</td>
<td>0.095</td>
<td>0.029†</td>
<td>0.715</td>
<td>0.602</td>
</tr>
<tr>
<td>Night duty should be limited to no more than six consecutive nights</td>
<td>0.028†</td>
<td>0.059</td>
<td>0.220</td>
<td>0.039†</td>
<td>0.179</td>
</tr>
<tr>
<td>Do you agree that your program will be able to implement the new ACGME proposed duty-hour week regulations?</td>
<td>0.072</td>
<td>0.167</td>
<td>0.112</td>
<td>0.328</td>
<td>0.073</td>
</tr>
<tr>
<td>Overall, will you be satisfied with the new ACGME proposed duty-hour week regulations?</td>
<td>0.000</td>
<td>0.001</td>
<td>0.000</td>
<td>0.036</td>
<td>0.020</td>
</tr>
</tbody>
</table>

† Significant at 5%. Significant pair-wise differences are reported in the subgroup section.
‡ Program type: Do you have 0, or 1-2, or more than 3 residency programs other than family medicine?
our overall findings strongly indicate that consideration of residents’ perspectives and opinions is necessary in developing effective resident duty-hour regulations.

Limitations
Our study may include the following major limitations. First, the residents surveyed were not randomly selected and therefore may not be representative of the population of current family medicine residents. In addition, only 20% of the invited program directors actually sent the survey to their residents, and no attempt was made to follow up with those who did not respond. Further, the respondents were self-reporting. Thus, our findings may be confounded by sampling and recall bias. Second, our survey did not include all the ACGME proposed changes. Specifically, we only investigated the four domains perceived as most important in a recent program directors survey. Finally, since our data are limited to family medicine residents, these results should not be generalized to other specialties, especially general surgery and obstetrics and gynecology.

Conclusions
Our sample of family medicine residents showed mixed support for the proposed ACGME duty-hour changes. While agreeing that there are significant educational and personal benefits from current duty-hour restrictions and some proposed revisions, many remain concerned about its potential negative impact on patient care and their personal preparation for future realistic work hours. More than half of the respondents questioned further restriction of interns’ work hours, as well as their programs’ ability to implement the new changes. We recommend that the ACGME consider the concerns of the residents and program directors before enacting the entire duty-hour proposal. Further, in the future, resident and patient outcome studies in each medical specialty should be conducted to further assess the benefits or harm of limiting resident duty hours within residency training.

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