Impact of System Interventions

From Adversary to Partner: Have Quality Improvement Organizations Made the Transition?

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Objective. To describe the perceived impact of the Centers for Medicare and Medicaid Services Quality Improvement Organizations (QIOs) on quality of care for patients hospitalized with acute myocardial infarction, in the context of new efforts to work more collaboratively with hospitals in the pursuit of quality improvement.

Data Source. Primary data collected from a national random sample of 105 hospital quality management directors interviewed between January and July 2002.

Study Design. We interviewed quality management directors concerning their interactions with the QIO interventions, the helpfulness of QIO interventions and the degree to which they helped or hindered their hospital quality efforts, and their recommendations for improving QIO effectiveness.

Principle Findings. More than 90% of hospitals reported that their QIO had initiated specific interventions, the most common being the provision of educational materials, benchmark data, and hospital performance data. Many respondents (60%) rated most QIO interventions as helpful or very helpful, although only one-quarter of respondents believed quality of care would have been worse without the QIO interventions. To increase QIO efficacy, respondents recommended that QIOs appeal more directly to senior administration, target physicians (not just hospital employees), and enhance the perceived validity and timeliness of data used in quality indicators.

Conclusions. Our study demonstrates that the QIOs have overcome, to some degree, the previously adversarial and punitive roles of Peer Review Organizations with hospitals. The generally positive view among most hospital quality improvement directors concerning the QIO interventions suggests that QIOs are potentially poised to take a leading role in promoting quality of care. However, the full potential of QIOs will likely not be realized until QIOs are able to engender greater engagement from senior hospital administration and physicians.

Key Words. quality, quality improvement organizations, peer review organizations, acute myocardial infarction

Quality Improvement Organizations (QIOs), formerly called Peer Review Organizations (PROs), are the primary means by which the Centers for Medicare and Medicaid Services (CMS) promote quality of care for Medicare's 40 million beneficiaries. Fifty-three QIOs contract with CMS in the

United States (CMS 2003). Direct funding to QIOs for the current 3-year contract is approximately \$735 million (Sprague 2002), or about \$18 per Medicare beneficiary.

Despite the expansion of the QIO mandate and the substantial resources devoted to this effort, there are few published evaluations of the QIO program. Meanwhile, although the quality of care delivered to Medicare beneficiaries has improved significantly over time for many indicators (Jencks and Wilensky 1992; Ellerback et al. 1995), the improvement has been uneven across states (Jencks et al. 2000) and hospitals (Bradley, Herrin et al. 2004), and many patients still do not receive guideline-based care (McGlynn and Brook 2001). In assessing the QIO program, studies of national or statewide changes in quality indicators over time are helpful; however, one aspect of evaluation that is missing from the literature are the hospitals' views on the effectiveness of the QIOs in improving quality of care at their institutions. Such information is vital in assessing the value of the QIO program and identifying opportunities for its improvement.

Accordingly, we interviewed hospital quality management directors to assess their views of the impact of the QIO on quality of care for patients hospitalized with acute myocardial infarction (AMI). AMI provides an excellent opportunity to assess QIO efforts because it is a common reason for admission, it has common indicators by which to measure quality of care, and it was one of the six clinical areas highlighted by CMS for quality improvement initiatives undertaken by the QIOs (Health Care Financing Administration Request for Proposal 1999).

HISTORICAL ROOTS OF QIO PROGRAM

The roots of the QIO program date back to the 1970s with the creation of the Professional Standards Review Organization (PSRO) program. PSROs were

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charged with performing utilization reviews and studies to improve the quality of care for federally subsidized insurance programs, primarily Medicare and Medicaid (Jost 1989). In 1982, as part of the Tax Equity and Fiscal Responsibility Act, Congress replaced the PSRO program with the Utilization and Quality Control PRO Program (Jost 1989; Institute of Medicine 1990), now known as the QIO Program.

The PROs initially took an “inspect and detect” approach to assessing the quality of services. PROs were to: (1) assemble and analyze data on services provided to Medicare beneficiaries and (2) intervene when services had been provided unnecessarily, inappropriately, or with inadequate quality (Jost 1989). Under their contracts with the Health Care Financing Administration (HCFA, now CMS), the PROs were required to randomly sample a percentage of hospital records for case review. This case review focused on seven indicators of deficient care (General Accounting Office 1988; Jost 1989; Institute of Medicine 1990): inadequate discharge planning, medical instability of the patient at discharge, deaths, nosocomial infection, unscheduled return to surgery, trauma suffered in the hospital, and medication or treatment changes within 24 hours of discharge without adequate observation (Institute of Medicine 1990). If a hospital had too many deficiencies within sampled records, the PROs could do an intensified (100%) review of records to estimate the magnitude of the deficiency (Jost 1989). Physicians with persistent quality problems faced harsh penalties, including payment denial and recommended exclusion from participation in the Medicare program (Jost 1989).

The “inspect and detect” approach was problematic for several reasons. Many physicians and hospitals perceived the review process to be flawed, a view supported by studies showing poor reliability of peer assessments of quality of care (Berry 1992; Goldman 1992) and inconsistent PRO processes across states (Institute of Medicine 1990; Kellie and Kelly 1991). In addition, HCFA was unable to document any improvement in the quality of care delivered to Medicare beneficiaries as a result of the PRO “inspect and detect” efforts (General Accounting Office 1988; Audet and Scott 1993; Ellerback et al. 1995; Weinmann 1998). The PRO processes of retrospective auditing and potential penalties led to an acrimonious relationship between PROs and hospitals and their physicians (Jencks and Wilensky 1992; Nash 1992; Audet and Scott 1993; Weinmann 1998). Rather than fostering an environment for proactive improvement of the quality of care for patients, the inspection approach pitted regulators against hospitals and physicians, and did little to advance quality improvement initiatives (Weinmann 1998).

In 1992, HCFA dramatically changed the role of PROs with the implementation of the Health Care Quality Improvement Initiative (HCQII) (Jencks and Wilensky 1992). The HCQII changed the PRO program's approach to data collection, its quality of care evaluation criteria, and its role in implementing quality initiatives. First, the approach to data collection shifted from individual case reviews to reporting patterns of care delivered to beneficiaries (Audet and Scott 1993). PROs were to examine practice patterns at the institutional, regional, and national level, rather than uncover individual physician lapses in quality for punitive purposes (Audet and Scott 1993). Second, PROs were to evaluate quality of care using national, disease-specific guidelines, rather than local criteria (Jencks and Wilensky 1992). Third, instead of merely collecting and reporting data, PROs were to work collaboratively with hospitals as partners in the development and implementation of hospital quality improvement initiatives (Jencks and Wilensky 1992). These changes, designed to transform the PRO from adversary to partner, represented a dramatic shift in vision and potential impact of the PRO system on hospital quality. The first initiative for the HCQII was the implementation of the Cooperative Cardiovascular Project, which began in 1992 as a four-state pilot project to develop quality indicators for the care of AMI patients and support hospitals in their development of quality improvement initiatives (Sprague 2002). Quality indicators were applied using retrospective review of the medical records of Medicare patients discharged with a principle diagnosis of AMI over a 9-month period in four pilot states (Ellerbe et al. 1995). PROs also intervened in these four states by facilitating and encouraging the adoption of quality improvement initiatives in AMI care. A follow-up study found significant improvement in the quality indicators and survival rates after AMI in the pilot states, as compared with the nonpilot states, suggesting significant success of the interventions aided by the PROs (Marciniak et al. 1998).

During the next two contract cycles (1996–1999 and 1999–2002), PROs implemented AMI quality initiatives in hospitals nationwide, and, by 1999, had broadened their scope to include national quality of care projects in breast cancer, diabetes, heart failure, pneumonia, and stroke (Sprague 2002). During the period 1998/99 to 2000/01, more than half of the states improved on 20 of the 22 quality of care indicators for these medical conditions (Jencks, Huff, and Cuerdon 2003). Consistent with the new collaborative style and broadening scope of the PRO program, it was officially renamed the QIO Program in 2001 (CMS Federal Register 2002). While this name change was largely symbolic, it was indicative of the expanding role of QIOs in quality improvement initiatives.

QIOs are currently operating within the seventh contract cycle with CMS and have been charged with quality improvement initiatives in numerous clinical areas and across a variety of health care settings. However, despite the expansion in the QIOs' responsibilities, there has been no published assessment of whether or not hospitals believe QIO interventions are improving the quality of care. This information would be helpful to define the extent of the QIOs' current success in assisting hospitals to improve care and to direct future efforts of the QIOs.

METHODS

Study Design and Sample

We conducted a cross-sectional study of acute care hospitals selected randomly from all acute care hospitals operating in 2001 and listed in the CMS's Online Survey Certification and Reporting System (OSCAR). We randomized all acute care hospitals listed in OSCAR and contacted each in succession until our target sample size of about 100 interviews was achieved. This was reached after attempting contact with 127 hospitals. Of these 127 hospitals, three were eliminated because they reported that they did not care for patients with AMI ($n = 2$) or they had closed their inpatient facility ($n = 1$), leaving 124 hospitals eligible for the study. Of these, two could not be contacted after seven attempts, and 17 refused to participate in the survey, resulting in a final sample of 105 (response rate = $105/124$ or 85%). The primary reason given for refusal was not having enough time. Nonrespondents did not differ in geographical location from respondents. Hospitals were recruited for the study with a letter from a CMS official stating the purpose of the survey, the expected length of the interview, and the type of person to be interviewed. We then telephoned the hospital to determine who was the most involved in quality improvement efforts for AMI at the hospital, typically the Director of Quality Management. Interviews were completed during January 2002–July 2002.

Survey Instrument and Measures

The survey instrument assessed (1) the reported level of contact between the hospital quality department and the QIO (number of contacts with QIO about improving overall quality of care and about improving AMI care in particular in the last year; number of people at the QIO with whom the hospital had contact about quality of care at least twice per year; preference for more, the same, or less contact with QIO); (2) the reported QIO interventions related to

AMI (from a list of 10 possible interventions and activities) that had been conducted in the 3 years prior to the survey and the perceived helpfulness of each as well as the overall helpfulness of the QIO in improving quality of AMI care; and (3) whether the QIO interventions had improved the quality of AMI care at the hospital in the last 3 years (whether the respondent thought AMI care would have been different without the QIO interventions and, if so, would AMI quality have been a little worse, a lot worse, a little better, or a lot better without the QIO interventions). We also asked an open-ended question at the end of survey, "How might the QIO have done better to improve the quality of AMI care at your hospital?" in order to elicit hospitals' recommendations for improving the QIO's effectiveness at their hospital. We tape-recorded all interviews, and responses to the open-ended questions were transcribed verbatim by a professional, independent transcriptionist.

Several respondent and hospital characteristics were also obtained via survey. We assessed the quality management director's background and training (clinical versus nonclinical), tenure at the hospital, tenure in the current position, and to whom they reported (senior management level or lower). We obtained hospital characteristics, including number of operating beds, ownership type, whether the hospital was part of a multi-hospital system, whether the hospital was an academic medical center, whether the hospital performed percutaneous coronary interventions and/or coronary artery bypass graft operations, and the hospital's geographic region. Survey questions are available from the authors upon request.

Data Analysis

We described the reported level of contact with QIOs, the prevalence and helpfulness of QIO interventions, and perceived impact of the QIOs on quality of care using means and frequency analyses. We assessed the bivariate associations between the dependent variables and the characteristics of the respondents and of the hospitals using χ^2 and *t*-test statistics as appropriate. We employed multivariable analyses (multiple regression and logistic regression) to explore adjusted relationships between the dependent and independent variables, although the relatively small sample size limited the statistical power of these analyses in this primarily descriptive paper. We analyzed hospital bed size both as a continuous variable, and, in separate analyses, an ordered categorical variable indicating < 50, 50–99, 100–199, 200–399, 400–599, and $\geq$ 600 beds. Our unit of analysis was the hospital; hence we did not weight the analyses by number of beds; however, we explicitly tested

associations between hospital size and reported QIO contact and reported QIO impact on quality of AMI care.

We analyzed open-ended questions using the constant comparative method of qualitative data analysis (Strauss and Corbin 1998). We developed a code sheet “from the ground up” (Patton 2000) reflecting conceptual domains described by respondents. Using line-by-line review of the transcribed, open-ended data, we coded statements as illustrating distinct domains, each reflecting ways in which the QIO might have been more helpful. We used *NUD-IST 4* to organize, code, and analyze open-ended data.

RESULTS

Sample Characteristics

Table 1 displays sample hospital characteristics. Reflecting the profile of hospitals nationally, the majority of hospitals surveyed had fewer than 200 beds (68%) and were nonprofit (84%). Most of the respondents were trained as nurses (74%). The mean tenure of the respondents was 12.8 years at the hospital and 5.8 years in their current position.

How Much Contact Was There with the QIO Regarding AMI Quality?

The reported contact between the hospital and QIO concerning quality of care in general, and quality of AMI care in particular, is reported in Table 2. The mean and median number of contacts regarding quality of AMI care was 3 (standard deviation of the mean = 4); however, respondents in 24 hospitals reported that they had no contact with the QIO about AMI quality, and about one-fifth (21%) could not name anyone at the QIO that was involved with quality efforts in AMI care. While the majority (73%) of quality management directors reported that the amount of contact with the QIO was appropriate, 27% preferred more contact with the QIO regarding improving quality of AMI care; none preferred less contact. Of the 24 respondents that indicated no contact with the QIO regarding quality of AMI care, 42% ($n = 10$) reported that they would prefer more contact with the QIO, while 50% ($n = 12$) desired no contact.

Respondents from for-profit hospitals, compared with nonprofit or government-owned hospitals, reported having more frequent contact with QIOs regarding quality of AMI care (mean contacts per year = 6 and 3, respectively, t -test p -value = .04). In addition, having shorter tenure in one's current position was associated with having more contact with the QIO regarding quality of AMI care (p -value = .04). The background and training of the respondent,

Table 1: Description of Hospital Sample ($N = 105$)

	<i>n</i>	% (<i>n/N</i>)
Hospital size		
<50 beds	23	22
50–99 beds	22	21
100–199 beds	26	25
200–399 beds	23	22
400–599 beds	5	5
≥ 600 beds	6	6
Reported ownership		
Nonprofit	88	84
For-profit or government	17	16
Part of multi-hospital system in last 3 years		
Yes	42	40
No	63	60
Academic medical center (missing = 1)		
Yes	13	13
No	91	87
Geographic region		
Northeast	26	25
South	34	32
Midwest	29	28
West	16	15
Cardiac services		
Performs PCI	28	27
Performs CABG	26	25

PCI, percutaneous coronary interventions; CABG, coronary artery bypass graft operations.

his/her tenure as hospital employees, and whether he/she reported to senior management were not significantly associated with reported or desired frequency of contact with the QIO in either bivariate or multivariable analyses. Similarly, the number of contacts with the QIO did not differ by any hospital characteristics measured including number of beds, geographical region, being an academic medical center, or presence of cardiac facilities (p -values $>.10$).

In describing the contact that respondents had with QIOs, several respondents noted that the QIO staff had been particularly approachable, highlighting the importance of the interpersonal relationships quality management staff built with their QIO representatives. For example, respondents reported:

When [the QIO representative] visits, she's nonjudgmental and she really helps us to see different ways to look at charting, and improves our education. . . . Those ladies [from the QIO] are highly professional and extremely knowledgeable; they

Table 2: Extent of Contact with Quality Improvement Organizations (QIOs) ($N = 105$)

	<i>Mean (SD)</i>	<i>Median</i>	<i>Range</i>
How many times in the last year did you have contact, including e-mail contact:			
With QIO about quality of care? [*]	10 (11)	15	(0,40)
With QIO about quality of AMI care? [†]	3 (4)	3	(0,21)
Are you able to name anyone at the QIO involved with quality efforts in AMI care?			
	<i>n (SD)</i>	<i>%</i>	
Yes	81	79	
No	21	21	
Missing	3		
Preferred interaction with QIO regarding quality of AMI care:			
More contact preferred	28	27	
About as much contact as you have now	74	73	
Less contact preferred	0	0	
Missing	3		
Are there additional ways in which you would like to interact with the QIO concerning quality of AMI care?			
Yes	28	30	
No	64	70	
Missing	13		

^{*} $N = 101$ because of missing responses.

[†] $N = 99$ because of missing responses.

have the appropriate skills and skill levels to assess and evaluate and give us highly credible recommendations.

What Interventions Did the QIOs Use and How Helpful Were They Considered?

Quality management directors reported diverse interventions and activities performed by the QIO related to improving AMI care quality. Table 3 displays the reported prevalence of each of the 10 interventions or activities queried in the survey and the perceived helpfulness of each intervention. The most commonly reported QIO interventions were the provision of educational materials, benchmark data, and hospital performance data. These were each reported by more than 75% of the respondents. More than 70% of the respondents reported that the QIOs conducted educational programs, and more than half reported that QIOs collected, not merely disseminated, performance data. Fewer reported that the QIOs helped develop quality indicators (40/105 or 38.1%), trained staff in quality improvement methods (36/105 or 34.3%), conducted corrective action (13/105 or 12.4%), participated in

Table 3: Quality Improvement Organization (QIO) Interventions and Their Perceived Helpfulness in Improving Acute Myocardial Infarction (AMI) Care

<i>Intervention</i>	<i>n/105</i>	<i>Perceived Helpfulness</i> ^{*,†}			<i>Mean Rating</i> [‡]
		<i>Not Very Helpful</i> [†] (%)	<i>In the Middle</i> [‡] (%)	<i>Very Helpful</i> [§] (%)	
Provided educational materials	99	7	28	65	3.8
Provided benchmark data	93	5	24	71	3.9
Provided hospital performance data	82	10	29	61	3.8
Conducted educational programs	75	8	32	60	3.6
Collected performance data	61	10	23	67	3.8
Helped develop quality indicators	40	2	13	85	4.2
Trained staff in QI methods	36	9	34	57	3.7
Conducted corrective action	13	8	38	54	3.7
Participated in QI teams	4	25	0	75	3.8
Participated on other committees	1	100	0	0	

Overall, how helpful has the QIO been in improving AMI care at your hospital?

		<i>n/105</i>	<i>%</i>
Not at all helpful =	1	11	11
	2	17	16
	3	45	43
	4	23	22
Extremely helpful =	5	8	8
Missing		1	

*Percentage of respondents who received the intervention or activity.

†Scores range 1–5, with 5 indicating greater helpfulness.

‡Includes ratings of 1 and 2.

§Includes ratings of 3.

§Includes ratings of 4 and 5.

quality improvement teams (4/105 or 3.8%), or participated on other hospital committees (1/105 or 1.0%).

The majority of respondents found each of the QIO interventions, except one, to be “very helpful” in improving AMI care at their hospitals. Activities that were reported to be “very helpful” by the greatest percentage of respondents were: the development of quality indicators (85%), participation in quality improvement (QI) teams (75%), and provision of benchmark data (71%). Illustrating the particular usefulness of providing benchmark data, respondents stated:

During the last three years the way that [the QIO] has been most useful to us is by providing data and benchmarking. We’ve been able to take that to medical section

meetings and to leadership, and it has underscored the importance of protocols, especially medication and process protocols for AMI patients. . . . By providing benchmark data, [the QIO] tells us how we compare to other institutions in the state and the region. It's very helpful to compare against what's going on in the community. It offers a forum for people to share ideas and strategies that people have implemented in their facilities to build upon successes.

Did the QIOs Change the Quality of AMI Care?

Table 4 displays the reported impact of the QIOs on hospital performance in AMI care. About one-third of the respondents ($n = 32$ of the 99 respondents to this question, or 32%) believed that their hospital's performance in AMI care would have been different if the QIO had not intervened. Of these 32 respondents, the vast majority ($n = 23$ of the 32 respondents, or 72%) believed that AMI care would have been a little worse without the QIO interventions. An additional four respondents (13% of the 32 who reported the QIO affected AMI care) thought AMI care would have been a lot worse without the QIO interventions. Perceptions about whether AMI quality of care would have been different without the QIO were not significantly correlated with any of the respondent or hospital characteristics measured.

Responses to the open-ended questions illustrated the ways in which quality management directors believed the QIO interventions positively influenced the quality of AMI care at their hospitals. For instance, several described that the QIOs provided the clout to motivate quality improvement and indicated that the QIO had given them credibility in pursuing quality improvement efforts in the hospital. For example, one respondent stated:

They [QIOs] have a big hammer and our doctors respect their hammer. So they do what they're supposed to do. They sometimes don't do things until they are hit over the head with it. . . . I think [the QIO] has put more credibility into how important this is for our physicians because the QIO is respected. The word "QIO" still does strike some fear. For those [hospital staff] who maybe wouldn't have been as concerned or as involved, [having] the CMS backing really did add to the importance of it. . . . I think that just generally, as in anything, the idea of someone collecting data and presenting it to you—certainly the first thing [is] the Hawthorne effect; somebody is looking. So I think they served as a conscience and provoked us to do things that we normally wouldn't do.

In contrast, almost 40% of hospital quality management directors (39 of the 99 respondents to this question) reported that the QIO had not affected quality of AMI care either positively or negatively (Table 4). Open-ended responses helped explain why this might be the case. Several respondents suggested that the QIO had not influenced quality of care because the hospital had already

been conducting quality improvement efforts in AMI care long before the QIO became involved. The following quotation illustrates this point:

We, as a hospital corporation, were on board with this before the QIO came around. It's something that we've been working on as a corporation for some time, and it wasn't that [the QIO] wasn't helpful; it's just we were on board with this before they were. . . . A lot of it we could work on, we did work on, but we were doing it before the QIO even pointed anything out.

Additionally, some quality management directors believed it was not possible for QIOs to improve quality regardless of their interventions. These respondents viewed the role of the QIO as one of data collection and reporting only. For example, one respondent remarked:

I think the QIOs are helpful to gather information, but I don't think [they have] one single thing to do with improving care. [It's] kind of philosophical. . . . I see their role as a passive one. Actually I think *we* improve the care; I don't think the QIO improves the care.

What Could the QIOs Do Better to Improve Quality of AMI Care?

Recommendation #1: Improve Validity of the Data. Respondents related that QIO data were not always perceived to be valid, and some respondents

Table 4: Perceived Impact of Quality Improvement Organizations (QIO) on Acute Myocardial Infarction (AMI) Care at Respondent Hospitals

	<i>n</i>	%
<hr/>		
Do you think performance in AMI care would be different at your hospital if the QIO had not intervened? (<i>n</i> = 105)		
Yes	32	32
No	39	39
Don't know	28	28
Missing	6	
If the QIO had not intervened, how do you think the performance in AMI care would be? It would it be: (<i>n</i> = 32)		
A lot worse	4	13
A little worse	23	72
About the same	0	0
A little better	1	3
A lot better	0	0
Don't know	4	13
<hr/>		

described that there were substantive problems with data quality. Quality management directors noted that in order to be engaged in quality improvement efforts, physicians had to believe that the data used to measure and report quality were valid; without this credibility, the QIO data would not change physician behavior and, in fact, could hinder improvement efforts in the hospital. For instance, respondents described:

There were errors in the [QIO] data because of the definitions that were used, so the data were not accurate. Our medical staff just went into a tailspin; it took a long time for them to trust the whole program, not just our QIO. The [medical staff] developed some trust again with the QIO, but . . . it took a long time. . . . Some of the things that we have to put a “no” for make it look like we missed the criteria, when actually we are working with our tertiary centers a lot of the times on those patients that we are transferring. Sometimes they don’t want the aspirin or they don’t want the clot buster type thing . . . sometimes those particular numbers are misleading.

Recommendation #2: Improve Timeliness of Data. In addition to the perceived validity of the data, quality management directors highlighted the importance of making sure that the data were timely. They indicated that the data were not meaningful unless they reflected recent cases; data that were a year or several months old were perceived as not helpful. Respondents stated:

The hardest part, even though QIO has been very helpful, is getting physicians to buy in to the data being relevant and useful. . . . I think the one limitation is the data tend to come back a little slowly. We like what the QIO does, but we are looking for a little more timeliness in the turnaround. I mean, they’ll collect data now, and it will be several months before we see it again. So we will make three or four changes in the meantime, and it’s hard to correlate our current performance with what it was.

Recommendation #3: Appeal to Physicians Directly. Appealing more directly to the physicians was viewed by many respondents as a crucial next step for QIOs to enhance their impact on quality of care. Respondents described that QIO interventions were too often targeted to hospital quality management staff, rather than to physicians, who were the ones most responsible for quality of AMI care. The following quotation reflects this theme:

It would be nice to have more involvement [from the QIO] on a personal level with our physicians. . . . The only other thing [the QIO] might have done better was if they had spoken directly to the physicians themselves. . . . Go to the physicians directly. We can monitor all those indicators, but it’s in the physicians’ power. If they don’t prescribe the aspirin at discharge it’s not the hospital’s [fault]. We monitor that, but there are things that the hospital can’t control.

Recommendation #4: Appeal to Senior Administration More Effectively. Similarly, quality management directors expressed their wish that the QIOs might have had greater impact at the CEO (chief executive officer) and senior management levels of hospitals. Illustrating this concern, one respondent said:

I think they need to maybe work more with upper administration. My biggest struggle was I didn't have really good physician buy-in. I don't think they understood the importance of the project. So if they could do better with hitting the CEOs on how important this is, it could trickle down and do better.

DISCUSSION

Quality management directors were generally positive about the role of the QIO in supporting their quality improvement efforts. The most commonly reported interventions included provision of educational materials, benchmark data, and hospital performance data, and many hospitals also reported that QIOs helped develop quality indicators for the hospital. Each of these interventions was rated as helpful or very helpful by more than 60% of hospital quality management directors. About one-quarter of hospitals reported that quality of AMI care would have been worse without the QIO interventions. On the other hand, many hospitals did not think the care would have been any different without the QIO efforts, or were undecided about the impact of the QIO on quality of AMI care. Many believed the hospital was taking steps to improve AMI care prior to the QIO initiatives; therefore, while they viewed the QIO as helpful in supporting improvement efforts, they did not view the QIO as the genesis of such efforts.

During a time when the PRO system was consciously shifting from an "inspect and detect" approach to a proactive, quality improvement approach for promoting hospital quality, our findings identify successes of this new approach and also illuminate the challenges ahead. The QIOs seem to have made a successful transition from adversary to partner with hospitals in promoting quality. This is evidenced by the frequent and positive contacts between the QIO and the hospital quality management staff, the many QIO interventions, and the prevalent view by hospitals that these interventions are helpful.

At the same time, quality management directors identified several opportunities for QIOs to strengthen their influence on quality of care in hos-

pitals. Respondents emphasized enhancing the *perceived* validity of the data, rather than the objective validity, which was not criticized. The importance of how the data are perceived is consistent with previous studies of data feedback and its effectiveness in changing clinical practice (Thomson O'Brien et al. 2000; Bradley, Holmboe et al. 2004). Many quality management directors believed that the QIOs could be more effective in getting the attention of physicians and senior management. Interventions were generally described as being pitched at quality management and nursing staff, who then found it difficult to enlist the support of physicians or senior management. Clinical leadership and organizational support are key ingredients to successful performance improvement (Lomas et al. 1991; Soumerai et al. 1998; Bradley, Holmboe et al. 2001; Holmboe et al. 2003) and QIOs could be more effective in engaging physicians and senior management in such efforts.

The respondents in this study reflected a national sample of quality management directors from diverse geographical regions and acute care hospitals that differed in size, ownership type, and teaching status. However, the modest sample size limited our statistical power to detect differences by geographical regions and hospital or respondent characteristics. We interviewed quality management directors because they are typically the most informed about the influence of the QIO interventions on hospital care; however, we were unable to obtain the views of physicians and senior managers regarding the influence of QIOs, and their views may have differed from the perceptions of the quality managers. For instance, medical staff members may have been less positive than quality management staff about the impact of the QIOs on hospitals quality; however, we cannot know this from this study. Further, we did not assess the QIO perceptions of their own role in hospitals' improvement efforts. The opinions of hospital staff are only one part of a comprehensive evaluation of QIO activity. These findings can, however, reveal a previously unstudied aspect of QIO performance: their perceived influence on hospital quality of care by those with whom QIOs most commonly interact in the hospital setting.

Our study demonstrates that the QIOs have overcome to some degree the previously adversarial and punitive roles of PROs with hospitals. The generally positive view among most hospital quality management directors concerning the QIO interventions suggests that QIOs are potentially poised to take a leading role in promoting quality of care. However, to fulfill this leadership role effectively, QIOs will need to find ways to integrate physicians and hospital senior management more fully into QIO quality improvement initiatives. With greater involvement of these groups, QIO efforts can augment

existing hospital efforts to improve quality and can expand their ability to promote positive change in health care delivery.

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