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The effects of structure, strategy and market conditions on the operating practices of physician-organization arrangements

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Research to date has documented weak or inconsistent associations between market and organizational factors and the adoption of physician-organization arrangements (POAs) (e.g. physician-hospital organizations, management service organizations and independent practice associations) designed to increase physician integration. We argue that POAs may mask considerable variation in how these entities are operated and governed. Further, because the operating policies and practices of POAs are likely to influence more directly the behaviour of physicians than the structural form of the POA, they may be more sensitive to the market and organizational contingencies that encourage integration. This study attempts to test empirically the relative effects of POA type and market, strategic and organization factors on the operating policies and practices of market-based POAs. Results suggest that type
of POA, and market, strategic and organizational factors affect risk sharing, physician selection practices, physician monitoring practices and ways in which monitoring information is used to influence physician behaviour in POAs.

Introduction

The past decade has witnessed a substantial increase in the number of studies devoted to physician–organization integration (e.g. Burns and Thorpe, 1993; Coddington *et al.*, 1996; Dynan *et al.*, 1998; Gorey, 1997; Morrisey *et al.*, 1996; Shortell *et al.*, 1996a). This work has focused notably on structural vehicles or legal arrangements (e.g. physician-hospital organizations [PHOs], management service organizations [MSOs], foundation models and integrated salary models) touted to align the economic and strategic interests of hospitals/healthcare systems, on the one hand, and physicians/physician groups, on the other (Alexander *et al.*, 1996; Burns *et al.*, 1998; Burns and

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Thorpe, 1995; Morrisey *et al.*, 1999). Much of this research has been motivated by two major trends: managed care and integrated delivery systems. The general logic is that managed care and an increasingly competitive healthcare market will force providers to practise more cost effectively and provide a broad continuum of services and products (Cave, 1995; Succi and Alexander, 1999; Van Horn *et al.*, 1997). To do so will require providers to develop an integrated financing and delivery capacity. This means that hospitals and physicians must restructure their working relationships and incentives so that they are aligned with each other, with the requirements of managed care organizations and, ultimately, with the requirements of major purchasers of healthcare.

However, because both managed care and integrated delivery systems are umbrella concepts that subsume a variety of different arrangements and strategies, study results frequently confound the relationship among managed care, integrated care delivery and physician–organization integration (Shortell *et al.*, 1996). In particular, prior research has shown only weak or inconsistent relationships between managed care, competition and organizational characteristics, on the one hand, and structural mechanisms designed to align the interests of organizations and physicians, on the other (e.g. Burns *et al.*, 1998; Burns *et al.*, 2000; Morrisey *et al.*, 1999).

We argue in this paper that emphasis on structural models for achieving physician–organization integration is misplaced in that the same structures may mask a variety of operational practices and policies. These practices and policies are likely to be more sensitive to managed care and other 'drivers' than the structures themselves and thus may explain the relatively weak associations found in prior research. For example, PHOs generally exhibit similar structural properties, including professional services agreements with physician groups, joint contracting with managed care organizations, and separate incorporation from the hospital and physician group. These structural features, however, say little about how these entities are managed or governed, what criteria are used to monitor or select physician panels or what risk-sharing arrangements are in place. Because such attributes more directly influence the behaviour of physicians and the practice of medicine (through selection or direct behavioural controls), they are likely to be more sensitive to the market and organizational contingencies that encourage integration.

Research

In light of the above, we examined the following research questions:

1. To what extent do the operating policies and practices of physician–organization arrangements (POAs) differ across structural type? And
2. Do market, strategic and organizational conditions affect operating polices and practices of POAs independently of structural type?

These questions are analysed using a sample of 69 POAs affiliated with 52 hospitals in ten large integrated health systems. These system hospitals operate in a wide variety of markets and regions across the USA and allow the requisite variation for testing the study research questions.

Model

In this paper, we assume that the internal operating practices and policies of a physician–organization arrangement will have an important influence on physician behaviour and practice patterns. For example, a PHO that imposes tight selection criteria over which physicians become part of the POA panel is more likely to elicit aligned behaviours among physician members than PHOs that do not carefully select physician panel members. Similarly, POAs that place physicians or physician groups at greater financial risk for the success of the POA will be more likely to experience aligned behaviour than those that are predominantly hospital funded. Further, we argue that these internal operating policies may vary independently of the structural and legal properties of the arrangements. For example, two PHOs may vary substantially in the extent to which they actively use selection criteria to determine membership of the organization, or in their risk-sharing arrangements with physicians. To the extent that such operating policies matter, it is important to evaluate what characteristics of the market, organizational strategy and developmental stage of the POA determine its operating policies and practices and whether such

practices and policies vary independently of the legal structure of the arrangement.

We examine four dimensions of POA operational policies and practices believed to vary independently of the structural/legal form of the POA, and which potentially increase the alignment between the physician group and delivery organization. The first, ownership/equity, is defined as the extent to which different entities have equity positions in the POA, and are thus at financial risk for the success of the venture. The second dimension is physician selection, defined as the degree to which the POA exercises discretion over the composition of the physician panel in the POA through the use of specific criteria to screen potential physician members. Selectivity in physician panel selection is assumed to enable the POA to affect the behaviour of the organization and its members by including only those physicians whose practice patterns, backgrounds and skills are consistent with the objectives of the organization or the managed care firms with which it contracts. The third area, monitoring of physician behaviour and practice patterns, is defined as the extent to which the POA engages in ongoing assessment of its physician panel and individual physician members to ensure that their practices are consistent with the goals and objectives of the POA. This dimension is distinguished from selection criteria in that it refers to monitoring and assessment of physicians once they have joined the POA rather than to the screening criteria that may be used to determine whether or not a physician should be allowed to participate in the POA. The fourth dimension, use of monitoring information, describes the ways in which information collected about physician behaviour in the physician monitoring process is used to elicit change in behaviour. Together these four dimensions are intended to reflect mechanisms by which POAs can influence the behaviour and practice patterns of member physicians, thereby increasing the alignment of the physician group and delivery organization.

We expect that, after controlling for the structural/legal form of the POA, four organizational and environmental factors will influence the extent to which the POA adopts operating policies/practices that increase physician-organization alignment. The first—market share expansion strategy—is the extent to which the hospital is developing the POA as part of a strategy for expanding its market share through increasing its patient/enrollee base. Such strategies will compel hospitals to increase alignment with physician groups to effectively differentiate themselves from their competitors and to increase their attractiveness to managed care firms. Tighter alignment with physicians and physician groups may also be a first step toward locking physicians into an exclusive relationship with the hospital thus depriving competitors in the market with a critical foundation from which to expand their own market share. Hence, all things being equal:

> The greater the emphasis on expansion of market share as a strategy of the hospital, the more the POA will emphasize operating practices/policies that promote alignment between the physician group and the hospital.

A second potential organizational determinant of POA operating practices and policies is experience. In their initial start up phase, POAs may be reluctant, for example, to impose practices which restrict membership to certain physicians, or which closely monitor the practice patterns of physicians members once they become members. Such practices may be perceived as too risky during a period when cultivating goodwill among physician partners and getting the fledgling POA off the ground are the paramount concerns. Second, the POA may simply lack the necessary operational experience to introduce selection and monitoring practices appropriate to the physician panel in the context of its practice environment. Such practices emerge, in part, from the common experience of the hospital and physician group partners working together in the POA. Hence:

> The more established the POA, the more it will emphasize operating policies/practices that promote alignment between the physician group and organization.

Managed care is often cited as a key theoretical driver of organizational efforts to increase physician integration and for the establishment of POAs themselves. However, recent research indicates that not all organizations participate in POAs in response to managed care pressures (Alexander *et al.*, 1996a; 1996b; Burns *et al.*, 1998). Several studies have indicated, for example, that managed care *per se* was not a robust predictor of whether or not a hospital was involved with a POA. One explanation of these findings is that POAs may be created in

anticipation of, rather than in response to, managed care (Burns *et al.*, 2000, Morrisey *et al.*, 1996). Managed care, however, may play a more important role in the operating policies and practices of the POA. For example, to the extent that the POA is dependent on managed care contracts for its revenue, greater pressure may exist for the POA to influence physician behaviour to achieve efficiency and/or quality objectives of the managed care firm. Such pressure may compel POAs to establish practices/policies to align the physician group and the hospital more closely. Hence:

> The greater the managed care penetration in the market, the more the POA will emphasize policies/practices that promote alignment between the physician group and the hospital.

And:

> The greater the proportion of its revenue derived from managed care contracts, the more the POA will emphasize policies/practices that promote alignment between the physician group and the hospital.

Population and sample

We define 'market-based' POAs as corporate or contractual structures established under the joint sponsorship of a hospital/system and physician group to provide multiple services or to develop new business (Alexander *et al.*, 1996). Using mail surveys, 108 hospitals affiliated with the ten corporate members of the Centre for Health Management Research were contacted for the study; 85 hospitals responded (79% response rate). Of these, 52 reported having one or more market-based POAs. The sample is purposive rather than random in that membership of the centre is voluntary and reflects the interest of the member systems in the development of physician–organization arrangements

Data sources

Each hospital affiliated with member organizations of the Centre for Health Management Research was sent a 13-page survey addressing multiple aspects of POA structure and operations. General questions were asked about the number and type of POAs, year of establishment, strategic goals, and the level at which decisions to develop POAs are made. Most items in the survey were objective and could be answered by the person(s) most knowledgeable about the POAs (e.g. director of medical staff relations or director of strategic planning). Questions about strategic goals of POAs were more subjective. These questions were answered by the hospital CEO exclusively.

Additionally, detailed information was collected for each market-based POA identified in the survey. These questions addressed ownership, criteria for physician participation, physician performance monitoring and the use of monitoring information to reinforce or sanction behaviours. Of the responding hospitals, 52 reported on one or more market-based POAs. Forty hospitals reported on one POA, seven reported on two and five reported on three.

Two other sources of information were used to supplement the survey data. Data from the 1993 American Hospital Association Annual Survey were used to provide organizational context information such as bed size, admissions, urban/rural setting, and county market share. Data from the Group Health Association of America were used to construct measures of managed care penetration for the sample hospitals' markets.

Measures

Physician-organization arrangements

Six types of POAs, termed 'market-based' are the focus of this study: medical staff organized independent practice associations (IPAs), PHOs, MSOs, Integrated Salaried Models, Foundations and Outpatient Divisions. While foundations and outpatient divisions are distinct types of POAs, they are combined in the analyses described below since there were few of these types of POAs in the sample (3 and 4, respectively).

POA operational policies and practices are assessed in four domains for each POA: ownership, criteria for selecting physician partners, mechanisms for monitoring physician performance in the POA and approaches employed to reinforce or sanction behaviours. *Ownership* is measured by three variables: percentage of the POA owned by the hospital (percentage arrangement hospital owns), by physicians (percentage arrangement physicians own) and percentage of individual physician POA

members who are also investors in the POA (percentage of physicians investing in arrangement).

The second operational domain, *physician selection*, was measured by six variables. The first is a dichotomous variable indicating whether any of 27 specific criteria are employed to screen physicians who wish to participate in the POA (i.e. have criteria for physician participation in arrangement). The second measure is the total number of these criteria employed by each POA (total number of criteria).

Four variables measure the emphasis placed on specific attributes potentially valued in physician partners: physician reputation, physician loyalty, quality, and satisfaction. Four scales were created on the basis of summing items from subsets of the 27 criteria that reflect these different foci (see Box 1). Chronbach's alphas were calculated for the items in each of the scales. The variables measuring the relative emphases placed on the four characteristics are *reputation criteria* (three items; alpha = 0.60), *loyalty criteria* (six items; alpha = 0.77), *quality criteria* (five items; alpha = 0.83), and *satisfaction criteria* (six items; alpha = 0.91.

Five measures capture criteria to monitor physician performance (Box 2): a dichotomous

Box 1 *Selection criteria for physician membership in POAs*

Reputation criteria

Three criteria related to professional reputation (alpha = 0.60):

- Board certification
- Membership of professional societies
- Holds leadership position on medical staff committees.

Loyalty criteria

Six criteria related to loyalty to the hospital (alpha = 0.77):

- Membership of hospital medical staff
- 50% of admissions to the hospital
- High volume admitter
- High volume use of outpatient surgery
- High volume user of other outpatient services
- Utilization patterns.

Quality criteria

Five criteria related to quality (alpha = 0.83):

- Not named in malpractice suit
- Level of continuing medical education completed recently
- Hospital privileges not suspended/revoked
- Not subject to medical staff action
- Results of quality assessment studies.

Satisfaction criteria

Six criteria related to patient responsiveness (alpha = 0.91):

- Currently accepting new patients
- Office productivity
- Office hours
- Average waiting time for appointments
- Office has a patient complaint procedure
- Results of patient satisfaction surveys.

Box 2 *Performance monitoring criteria of physician partners*

Inpatient monitoring

Four criteria from inpatient practice (alpha = 0.86):

- Utilization
- Quality
- Diagnostic mix
- Costs.

Outpatient monitoring

Three criteria from outpatient practice (alpha = 0.81):

- Utilization
- Quality
- Costs/patient.

Office monitoring

Three criteria from office practice (alpha = 0.86):

- Utilization
- Patient satisfaction
- Costs/patient.

Use of monitoring data

- Positive: provide bonuses based on productivity or other criteria
- Negative (two items): sanction or terminate from participation in arrangement
- Neutral: give feedback to the individual or group.

variable indicating whether the POA employs any of the ten monitoring criteria to evaluate physician performance (use monitoring mechanisms in arrangement), a count of the ten potential monitoring mechanisms employed by the POA (total number of monitoring criteria) and counts of three subsets of the ten monitoring mechanisms that reflect three foci of monitoring: inpatient, outpatient care and office-based care. Chronbach's alphas were calculated for the items in each of the scales. The three measures of the foci of performance monitoring are *inpatient monitoring criteria* (four items; alpha = 0.86), *outpatient monitoring criteria* (three items; alpha = 0.81), and *office monitoring criteria* (three items; alpha = 0.86).

Four measures capture use of monitoring information. The first measure is a simple count of three possible ways the monitoring data are used (number of ways monitoring used). The second measure is a dichotomous variable indicating whether data from monitoring are used to provide positive reinforcement to physicians (monitoring used for positive reinforcement). The third measure is a dichotomous variable indicating whether the POA uses monitoring data either to sanction physicians or to terminate their participation in the POA (monitoring used for negative reinforcement). The fourth measure is a dichotomous variable indicating whether the data are used to provide neutral feedback to physicians with neither reinforcement nor sanctions attached (monitoring used for neutral feedback).

Contextual features of physician–organization arrangement development and operation

The *expansion* of existing markets strategy is represented by five items rated by the CEO from 1 (not at all important) to 5 (extremely important). The five items are broadening the hospital's primary care base and expanding into new markets, better positioning the hospital and physicians to compete in the managed care marketplace, establishing a distribution network for primary care, positioning the organization for direct contracting and providing a 'one-stop' shop for managed care payers. An index was created by averaging the importance ratings of these five items related to the expand existing markets strategy (Cronbach's alpha = 0.82).

The percentage of *managed care penetration* in the focal hospital's market was measured as the total population covered by managed care contracts in the metropolitan statistical area where the hospital is located. *Percentage managed care revenue* is the percentage of all revenue earned by the POA that is obtained through managed care contracts. Finally, age of POA was computed by subtracting the date of incorporation of the POA from the year of the study (1994)

Data analysis

Means and standard deviations were calculated for independent and dependent variables (see Table 1).

Two analyses were conducted. First, ANOVA was used to address the question of whether specific POA types differ in ownership, criteria for selecting physician partners, performance monitoring and use of monitoring to influence physician behaviour. These analyses used generalized linear models to control for instances in which more than one POA is sponsored by the same hospital. The results are shown in Table 1. Second, ordinary least squares (OLS) and logistic regression were performed to identify organizational and environmental factors associated with differences in operational policies and practices, after controlling for type of POA. In these analyses, choice of analytic technique is a function of the properties of the dependent variables. For those dependent variables approximating a normal distribution OLS was used. For more limited dependent variables, logistic or ordinal logistic regression was employed. Results are presented in Tables 2–5.

Results

Results for POA type

On average, hospitals account for three quarters of the ownership across all types of POAs (77.3%), while physicians own 14.0% and other investors account for only 4%. Hospital ownership by type of POA ranges from less than 14% of IPAs to complete ownership of the seven MSOs (100%). PHO ownership by hospitals averages 73.3%. Foundation and Outpatient Division ownership by hospitals averages 80%. Hospital ownership of Salary Model POAs averages almost 98%. Type of arrangement

Table 1 *Means for ownership, criteria for participation, performance monitoring and use of monitoring by type of arrangement*

	N	Mean	SD	1 IPA (*N*=12)	2 PHO (*N*=15)	3 MSO (*N*=7)	4 Found + output (*N*=7)	5 Salary model (*N*=28)	R^2P	Sign contrasts
Ownership										
Percentage arrangement hospital ownership	63	77.26	37.94	13.75	73.33	100.00	80.00	97.50	0.61‡	A†,B†,C†, D†,G†
Percentage arrangement physician ownership	63	14.01	30.31	56.25	16.67	0	0	2.50	0.41‡	A†, B†, C†, D†
Percentage physicians investing in arrangement	62	19.50	38.78	59.50	32.33	0	0	4.61	0.31‡	B†, C†, D†, G*
Selection criteria for participation										
Have criteria for physician participation in arrangement (Y/N)	64	0.73	0.45	0.64	0.80	1.00	0.80	0.68	0.05, NS	
Total number of criteria (0–27)	64	6.98	6.28	4.64	5.20	8.80	4.80	8.93	0.10, NS	
Reputation criteria (0–3)	64	0.91	0.92	0.64	0.67	0.80	0.40	1.25	0.12, NS	
Loyalty criteria (0–6)	64	1.34	1.30	0.73	1.33	2.60	1.60	1.32	0.12, NS	
Quality criteria (0–5)	64	2.09	1.77	2.00	1.67	2.20	1.20	2.50	0.06, NS	
Satisfaction criteria (0–6)	64	1.22	1.86	0.64	0.47	0.80	0.40	2.07	0.17*	G†
Performance monitoring										
Use performance monitoring mechanisms in arrangement (Y/N)	64	0.58	0.50	0.45	0.60	0.40	0.60	0.64	0.03, NS	
Total number of monitoring criteria (0–10)	64	3.42	3.70	2.55	4.27	2.20	1.20	3.93	0.07, NS	
Inpatient monitoring criteria (0–4)	64	1.28	1.56	1.09	1.60	0.60	0.40	1.46	0.06, NS	
Outpatient monitoring criteria (0–3)	64	1.11	1.25	0.91	1.47	0.60	0.60	1.18	0.05, NS	
Office monitoring criteria (0–3)	64	1.03	1.23	0.55	1.20	1.00	0.20	1.29	0.09, NS	
Use of monitoring to influence behaviour										
Number of ways monitoring used (0–4)	64	1.58	1.56	1.27	1.60	1.00	1.40	1.82	0.03, NS	
Monitoring used for positive reinforcement (Y/N)	64	0.36	0.48	0.18	0.20	0.20	0.20	0.57	0.15*	G*
Monitoring used for negative reinforcement (Y/N)	64	0.41	0.50	0.36	0.53	0.20	0.60	0.36	0.05, NS	
Monitoring used for neutral feedback (Y/N)	64	0.58	0.50	0.45	0.60	0.40	0.60	0.64	0.03, NS	

A=1:2; B=1:3; C=1:4; D=1:5; E=2:3; F=2:4; G=2:5; H=3:4; I=3:5; J=4:5. **P < 0.10;* †*P < 0.05;* ‡P *0.1.*
IPA = independent practice association; MSO = management service organization;
PHO = physician-hospital organization. NS, not significant; SD, standard deviation.

explains 61% of the variation in hospital ownership of POAs.

Physician ownership for all types of POAs averages 14.0%. This ranges from no ownership in MSOs or Foundations and Outpatient Divisions to 56% ownership of IPAs. Physicians, on average, have less than 3% ownership of Salary Model POAs (2.5%) and one-sixth ownership (16.7%) in PHOs. Type of arrangement explains 41% of the variation in physician ownership.

On average, about 20% of physicians participating in POAs also invest in them. This ranges from no physician investors in MSOs and Foundations and Outpatient Divisions to almost 60% investing in IPAs (59.5%). Significantly more physicians invest in IPAs on average than in MSOs, Foundations and Outpatient Divisions, or Salary Model POAs (4.6%). The type of POA explains over 31% of the variation in the percentage of physician participants investing in the POA in the ANOVA model.

Over 70% of POAs (73%) rely on formally specified criteria when selecting physician partners. This ranges from 4.64 criteria for IPAs to 8.8 criteria for MSOs. However, the difference among POA types is not statistically significant. On average, POAs use almost seven of the 27 criteria included in the survey (6.98). On average approximately two *quality criteria* (2.09, 29.9%), 1.3 *loyalty criteria* (1.34, 19.2%), 1.25 *satisfaction criteria* (1.22, 17.5%), and one *reputation criterion* (0.91, 13.0%) are employed.

Monitoring of physician performance is practiced in 58% of POAs in our sample. On average, over three (3.42) of the possible ten performance monitoring mechanisms are used. *Inpatient monitoring criteria* represent roughly 1.25 of this total on average (1.28, 37.4%), while *outpatient monitoring* and *office monitoring criteria* each account for just over one (1.11, 32.5% and 1.03, 30.1%, respectively). Type of POA is not a significant predictor of the focus of performance monitoring.

On average, *monitoring used to influence physician behaviour neutral feedback* is predominant (0.58, 36.8% of the total), followed by *negative reinforcement* (0.41, 25.9%) and *positive reinforcement* (0.36, 22.8%). Type of POA is a significant predictor only of the use of positive reinforcement. In the ANOVA model, type of POA accounts for 15% of the variation in the use of positive reinforcement.

Regression model results

Predictors in all regression models included *managed care penetration, percentage POA revenue from managed care, age* of the POA, importance of market *expansion* strategy and type of POA (Salary Model is the referent POA type). Table 2 presents results of the models predicting ownership and risk-sharing arrangements. Hospital and physician ownership interests are significantly associated with the percentage of revenue the POA derives from managed care and with the type of POA. After controlling for the type of POA, a higher percentage of hospital ownership is associated with a lower percentage of revenue from managed care, while

Table 2 *Regression results: the effects of POA type, environmental and organizational attributes on POA ownership*

	Percentage arrangement hospital ownership[a]	Percentage arrangement physician ownership[a]	Percentage physicians investing in arrangement[a]
Managed care penetration			− 1.00*
Percentage managed care revenue	− 0.22†	0.20†	0.41§
Age	−	−	2.93‡
Expand	−	−	−
IPA	− 67.21§	36.89§	−
MSO	−	−	−
Foundation/outpatient division	−	−	−
PHO	− 20.15†	13.91*	22.18†
Adjusted R^2, *P*	0.59§	0.36§	0.44§

a = Nonstandardized regression coefficients. $^*P < 0.10$; †$P < 0.05$; ‡$P < 0.01$; §$P < 0.001$

Table 3 *Ordered logistic regression results: effects of POA type, environmental and organizational attributes on POA physician selection criteria*

	Have criteria for physician participation[a]	Total number of criteria[a]	Reputation criteria[a]	Loyalty criteria[a]	Quality criteria[a]
Managed care penetration				1.07*	
Percentage managed care revenue					
Age	1.47*				1.13*
Expand	16.19‡	5.81‡	7.72‡	3.02*	7.18‡
IPA		0.18†	0.17*		0.22*
MSO			0.19*		
Foundation/outpatient division			0.13*		0.20*
PHO			0.32*		
−2 logl, *P*	21.07‡	15.45*	16.37†	14.01*	14.83*
C	0.85	0.69	0.72	0.69	0.69

a = Odds ratio. *$P < 0.10$; †$P < 0.05$; ‡$P < 0.01$; §$P < 0.001$.

greater physician ownership is associated with a higher percentage of revenue from managed care. Compared with Salary Model POAs, hospitals own lower percentages of IPAs and PHOs. Physicians own higher percentages of IPAs and PHOs (compared with Salary Model POAs). The regression models explain 59% of the variation in hospital ownership and 36% of the variation in physician ownership.

The percentage of physician participants in POAs who are also investors in the arrangement is significantly associated with the degree of managed care penetration, the percentage of POA revenue from managed care, the age of the POA and the type of POA. More physician participants are investors in POAs that receive a higher percentage of revenue from managed care, while fewer invest in POAs operating in settings with low managed care penetration. More physician participants hold equity positions in more established POAs. Compared with Salary Model POAs, more physician participants invest in PHOs. The regression model explains 44% of the variation in the percentage of physician participants investing in POAs.

Physician selection criteria models are presented in Table 3. Results of the logistic regression model indicate that the use of criteria to select physicians for membership in a POA is significantly associated with the age of the POA and the importance of a market expansion strategy. Controlling for POA type, organizations emphasizing a market expansion strategy are more likely to have formal criteria for physician participation. More established POAs are also more likely to have criteria for physician membership. Further, when selecting physician members for POAs, organizations with a market expansion strategy tend to use more criteria. Compared with Salary Model POAs, IPAs use fewer physician selection criteria.

Greater use of reputation criteria in selecting physician participants is associated with greater importance of a market expansion strategy. Compared with Salary Model POAs, IPAs, MSOs, PHOs and Foundation/Outpatient Division POAs all use fewer reputation criteria for selecting physician participants. Greater use of loyalty criteria is associated with higher managed care penetration in the market and greater importance of a market expansion strategy. Greater use of quality criteria in selecting physician partners is associated with the importance of a market expansion strategy for POA development. Compared with Salary Model POAs, IPAs and Foundation/Outpatient Division POAs are less likely to use quality criteria for selectinal physician participants.

Table 4 presents results of models predicting ongoing performance monitoring of physician participants in POAs. Use of any physician monitoring by POAs is associated with importance of market expansion strategy. Compared

Table 4 *Ordered logistic regression results: effects of POA type, environmental and organizational attributes on physician monitoring in POA physician selection criteria*

	Use performance monitoring in arrangement[a]	Total number of monitoring criteria[a]	Inpatient monitoring criteria[a]	Outpatient monitoring criteria[a]	Office monitoring criteria[a]
Managed care penetration					
Percentage managed care revenue		0.99*	0.98†		0.99*
Age					
Expand	8.70‡	10.50‡	18.79§		19.28§
IPA	0.15*				0.15*
MSO		0.12†	0.06†		
Foundation/outpatient division					0.07*
PHO					
–2 logl, *P*	14.78*	18.77†	21.41‡		23.00‡
C	0.78	0.73	0.77		0.77

a = Odds ratio. *$P < 0.10$; †$P < 0.05$; ‡$P < 0.01$; §$P < 0.001$.

Table 5 *Ordered logistic regression: effects of POA type, environmental and organizational attributes on use of POA monitoring information*

	Number of ways monitoring information used	Monitoring used for positive reinforcement[a]	Monitoring used for negative reinforcement[a]	Monitoring used for neutral feedback[a]
Managed care penetration	1.13‡		1.19‡	
Percentage managed care revenue				
Age				
Expand	10.70‡	12.99†	10.32†	8.70‡
IPA	0.10†	0.01‡		0.15*
MSO		0.10*		
Foundation/outpatient division		0.10*		
PHO	0.28*	0.03§		
–2 logl, *P*	26.56§	27.75§	25.89‡	14.78*
C	0.76	0.89	0.85	0.78

a = Odds ratios. *$P < 0.10$; †$P < 0.05$; †$P < 0.01$; §$P < 0.001$.

with Salary Model POAs, IPAs are less likely to use performance monitoring of any type. Use of more physician monitoring criteria by POAs is significantly associated with a lower percentage of POA revenue from managed care, with the importance of a market expansion strategy for POA development and with the type of POA. A greater number of inpatient monitoring criteria employed and a greater number of office-oriented monitoring criteria employed are both associated with lower revenues from managed care and with the importance of an expand strategy for POA development.

More varied use of monitoring information to influence physician behaviour is significantly associated with greater managed care penetration in the market and with the importance of a market expansion strategy (Table 5). Compared with Salary Model POAs, IPAs and PHOs use data from performance monitoring in fewer ways.

The logistic regressions indicate that the likelihood of using monitoring for positive reinforcement is significantly related to the importance of an expand strategy and type of POA. Compared with Salary Model POA, IPAs,

MSO, PHOs and Foundation/Outpatient Division POAs are all less likely to use monitoring for positive reinforcement. The likelihood of using monitoring for negative reinforcement is positively related to greater managed care penetration and to the importance of the expand strategy. Finally, use of monitoring to provide neutral feedback is greater for POAs with an expand strategy and is less prevalent for IPAs relative to Salary Model POAs.

Discussion

This paper has sought to address two research questions. First, are the structural models used to achieve physician–organization integration loosely or tightly coupled to the operating practices of integrated systems? Bivariate evidence reported in Table 3 suggest they are, at best, loosely linked. There is no widespread association between the structures and processes by which integration is attempted. Structural and processual integration may be orthogonal strategies developed at different periods to accomplish different ends. Thus, for example, the various structural models may be developed to obtain managed care contracts, while the operating practices are designed to partner with physicians or help them practise more efficiently under the managed care contracts already obtained. The loose coupling between structures and practices observed here is also reported in another study of the same healthcare systems (Burns *et al.*, 2000), which examined a different set of integrative processes. Those processes included rightsizing of physician panels, physician compensation and incentive systems (not including equity ownership), physician leadership development, and community-oriented care. A third study (Dynan *et al.*, 1998), however, does report more correspondence between integrative structures and processes in a national sample of hospitals. The divergence of findings may reflect the types of practices studied, the sampling methodology, or other factors.

Despite the absence of general linkages between structures are practices, there are some isolated relationships of interest. For example, IPA models (and PHOs, to some extent) are associated with greater physician ownership but lower levels of the other operating practices. This pattern reflects earlier findings (cf. Burns, 2000; Burns and Thorpe, 1995; Wholey and Burns, 1993) that physicians seek to strike a balance between their autonomy and their economic security. While they may invest financially in integrative strategies, they will also seek to minimize the degree of bureaucratic oversight to which they are subjected.

Conversely, physicians whose practices are acquired in integrated salary models (ISMs) have no equity investment but are often most heavily exposed to the other operating practices. That is, acquired physicians practice in integrated systems which have developed some managed care infrastructure (e.g. selection of physicians, monitoring criteria) to prepare for managing capitated risk. Such integrated structures appear to have the greatest potential for achieving alignment with their physicians. Indeed, surveys that compare the physician's perceived alignment with the organization across structural models reveal that acquired physicians report significantly higher alignment than do physicians affiliated with IPAs and PHOs (Burns *et al.*, 1996).

The second research question addressed here is whether operating practices are associated with strategic, market and organizational factors (independent of the structural models utilized). Tables 2–5 reveal some consistent support for our first two hypotheses. The pursuit of a market expansion strategy is positively associated with the presence of each operating practice (except equity ownership). This is not surprising, since the survey items that comprise the market expansion strategy index reflect hospital efforts to appeal to managed care payers (e.g. develop a primary-care base, provide one-stop shopping for managed care). This suggests that the hospital's strategy to appeal to managed care becomes partially implemented in the operating practices of physician selection, monitoring, and use of monitoring information. These are precisely the practices that HMOs utilize and that they report are keys to their financial success (cf. Gold *et al.*, 1995). By virtue of adopting these same practices, we might expect these hospitals to have greater success in obtaining managed care contracts, taking risk for covered lives, and managing capitated risk. Further research is needed to test this critical assertion.

The age of the POA is also positively associated with the development of two operating practices: physician equity investment and physician selection mechanisms. Asking physi-

cians personally to invest their earnings in a new venture and screening their qualifications for inclusion (or possible exclusion) are very sensitive issues. The former issue is difficult owing to physicians' risk aversion; the latter can foster much physician resentment and complaints to the board (or even lawsuits). Consequently, it is not surprising that such practices may be developed over time, rather than at the initiation of the POA, to allow physician trust to develop and the POA to mature. The remaining two operating practices (i.e. monitoring, and use of monitoring information) may not require as long a maturation period.

The relationships between the operating practices and the two market measures of managed care activity are less consistent and somewhat contradictory. Contrary to our third hypothesis, a higher level of managed care penetration is associated with less physician equity involvement; a higher percentage of POA revenues from managed care organization (MCO) contracts is associated with more equity involvement. One possible explanation for these results is that (a) higher HMO penetration increases the competitive uncertainty and pressure on physicians and thus reduces their likelihood of developing equity ventures with hospitals, while (b) greater POA success in gaining managed care contracts (holding constant the level of health maintenance organization penetration) reduces this uncertainty and increases their likelihood of equity investments.

Managed care penetration is also positively associated with the use of loyalty screening criteria and the use of monitoring data (especially for negative reinforcement). This suggests that managed care pressures hospitals to focus on their physicians' admitting and utilization behaviours as criteria for selecting physician partners and to monitor these behaviours in a pro-active (albeit negative) fashion. Thus, the hospital may seek to include heavy admitters in its medical panel but seek to exclude over-utilizers of hospital services.

Finally, the percentage of POA revenues derived from MCO contracts does not appear to be related to either the use of physician screening criteria or the use of monitoring data. However, such revenues are negatively associated with the use of monitoring mechanisms in inpatient and office settings. This finding is contrary to what we might expect. Perhaps, as suggested above, the de-emphasis on physician monitoring accompanies the increase in physician equity involvement as POA revenues from MCO contracts increase.

Overall, the weak relationships observed here between managed care activity and operating practices mirror recent evidence from other investigations. Burns *et al.* (1997; 2000) and Morrisey *et al.* (1996; 1999) similarly find weak link between managed care and integrated healthcare. As suggested earlier, integration may develop in anticipation of managed care (e.g. capitation is coming to town) or in mimetic response to the actions of neighbouring hospitals (cf. Burns *et al.*, 2000). The consistency of these findings suggests that researchers should examine other forces beyond managed care that may stimulate the rise of integrated delivery systems.

Without doubt, our findings should be interpreted cautiously. They are based on a non-representative sample of 52 hospitals from ten hospital systems across the USA. They are also cross-sectional results that reveal associations, rather than causation, between the variables studied. It is clearly desirable to conduct more longitudinal research on a larger sample of hospitals and healthcare systems to validate the results reported here.

Nevertheless, our findings suggest some important conclusions. First, the structures and practices of integration are only loosely coupled to one another. This suggests that hospital executives have considerable flexibility in designing processes and practices to integrate their physicians. The choice of practices to integrate with physicians is not tightly constrained by the specific structural vehicles employed. Thus, these practices can be designed in the light of the specific needs and interests of potential physician partners. Second, these practices are more tightly coupled with the integration strategies pursued by the hospital. A prior analysis of these same hospitals found that their strategic orientation was not closely associated with their configuration of structural vehicles for physician integration (Alexander *et al.*, 1996a; 1996b). Thus, in contrast to prior evidence in industry, strategy is not so much reflected in organizational structure as it is in organizational process. This conclusion is also reached in recent studies of global matrix firms (cf. Ghoshal and Bartlett, 1995; 1997) which suggest that organizational structure is inadequate for pursuing a

strategy of global product lines across multiple local markets. In such firms, processes are more important for coordinating and integrating the firm's various activities. Healthcare systems that develop multiple 'global' products (e.g. clinical service groups, information technology, managed care contracting capability, etc.) across their various hospitals' market areas not only resemble such global matrix firms but may also be faced with the same need for coordinative processes (Burns, 2000).

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