Organizational Systems Used by California Capitated Medical Groups and Independent Practice Associations to Increase Cancer Screening

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BACKGROUND. Patients in health maintenance organizations (HMOs) appear to have higher utilization of cancer screening tests than patients with fee-for-service insurance.

METHODS. The authors surveyed the medical directors of 174 physician organizations in a California network model HMO to obtain information regarding their organizational structure, implementation of guidelines, and use of systems to increase cancer screening.

RESULTS. The majority of independent practice associations (IPAs) and medical groups (IMGs) in this California HMO had guidelines and office systems aimed at improving cancer screening. These activities were reported more frequently for mammography and Papanicolaou (Pap) smears than for colorectal carcinoma screening. IMGs reported using flow sheets more often than IPAs. Chart audits were performed more frequently for mammography (48% for IMGs and 40% for IPAs) and Pap smears (45% and 40%, respectively) than for colorectal carcinoma screening (38% and 30%, respectively). Approximately 50% of IPAs and IMGs reported mailing reminders to patients for mammography and Pap smears, but only a few did so for colorectal carcinoma screening. Annual fecal occult blood testing was believed by most medical directors to be a reasonable strategy for managed care patients (86% of IPAs and 96% of IMGs); however, fewer believed that screening sigmoidoscopy for patients ages 50–70 years was a reasonable expectation (71% and 78%, respectively).

CONCLUSIONS. The majority of IPAs and IMGs in this California HMO reported using both guidelines and office systems to improve cancer screening rates. Further research is needed to understand the effect of these systems, as well their complex interactions with competing incentives, on cancer screening in managed care patients. ***Cancer* 2000;88:2824–31.** © *2000 American Cancer Society.*

KEYWORDS: cancer screening, managed care, guidelines, mammography, Papanicolaou smears, fecal occult blood test, sigmoidoscopy.

People who receive their health care through health maintenance organization (HMO) health plans appear to have higher utilization of cancer screening tests than people who have fee-for-service health insurance.[1–3] In addition, incident cancers are diagnosed at an earlier stage among HMO enrollees compared with fee-for-service insurance enrolees.[4] In contrast to HMO plans, fee-for-service insurance plans

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often fail to cover preventive services, suggesting that the higher utilization of cancer screening tests in HMOs may be the result of lower out-of-pocket costs to the patient. However, the RAND Health Insurance Experiment demonstrated greater use of preventive services by people who were enrolled in an HMO, even though the effect of additional out-of-pocket expenses was mitigated by the research design.[5] This has led some researchers to speculate that the effect of HMOs on utilization of preventive services may be mediated through organizational characteristics and not just coverage of these services.[6] The RAND Health Insurance Experiment was completed almost 2 decades ago and included only a single staff-model HMO. Since that time, enrollment in managed care plans has increased substantially, and the structures of managed care organizations have changed dramatically as well.[7,8] Newer HMO plans are relying on network and independent practice association models rather than the traditional group and staff model arrangements with providers to deliver health care. Between 1988 and 1994, the percentage of HMO enrollees in group or staff model plans dropped from 42% to 31%. The effect of these new organizational structures on the utilization of cancer screening services is unknown.

In California, the network model HMO has become the predominant model. In this organizational structure, sometimes referred to as a three-tiered HMO, the health plan is the top tier, individual physicians or physician practices make up the bottom tier, and new physician organizations form the middle tier, acting as financial intermediaries between the health plan and physicians.[9] Two types of physician organizations have developed to make up this middle tier. The first, integrated medical groups (IMGs), evolved out of traditional, multispecialty medical groups that were large enough to contract directly with HMOs to provide services for enrollees in exchange for a capitated payment. The second, independent practice associations (IPAs; not to be confused with IPA model HMOs that contract directly with individual physicians), are loose organizations of physicians and small practices that affiliate to be able to contract with health plans.[10]

Even under an identical HMO insurance plan contract, the care given to patients will vary with the providers and organizational characteristics of the IMG or IPA. According to Landon's model, four domains of organization may affect patient care: financial incentives, management strategies, structural characteristics, and the normative influences of interactions with professional colleagues.[11] Financial incentives vary widely among physician organizations, depending on whether physicians are reimbursed a fee for service, are paid a salary, or are given a capitated sum to provide care for patients. Management strategies include guidelines, utilization review, and other approaches designed to influence physician behavior. Structural characteristics that influence care include the physical environment of the practice and staffing. The normative influence of colleagues can occur with chance meetings (which, in turn, may depend on the physical environment of the practice), morbidity and mortality conferences, or quality-assurance meetings. In a network model HMO, any effect of the health plan on cancer screening rates is mediated through the contracted IMGs and IPAs.

Although physician beliefs and self-reported practices for cancer screening have been described extensively,[12–19] the approaches of physician organizations to cancer screening have not. In this study, the medical directors of IMGs and IPAs that had contracts with a large California network model HMO were surveyed to characterize these physician organizations with respect to financial incentives, management strategies, structural characteristics, and normative influences that may affect cancer screening. In addition, we wanted to learn whether they had organizational systems in place to improve their cancer screening rates and, if so, what types of systems they used.

MATERIALS AND METHODS

Building on work by Kerr et al.[20,21] that characterized the methods used by California IMGs and IPAs for quality assurance and utilization management, we developed a survey instrument to obtain information about California physician organizations' approaches to cancer screening. In preparation for the survey development, we conducted semistructured interviews with several medical directors and quality-assurance committees. We sought to understand the structural characteristics of IMGs and IPAs that could affect cancer screening, their use of and views of cancer screening tests, as well as organizational initiatives used to improve screening. Using the information obtained from these interviews, we designed a questionnaire to be completed by the medical director of an IMG or an IPA (available from the authors).

The questionnaire consisted of 118 items and took approximately 15 minutes to complete. The questions addressed organizational structure, implementation of guidelines, quality-assurance programs, the use of systems to increase cancer screening, colorectal carcinoma screening practices, and the medical directors' demographic characteristics and beliefs about cancer screening efficacy and feasibility in a managed care environment.

Blue Cross CaliforniaCare, a large for-profit Cali-

fornia managed care health plan, provided us with the contact information for the medical directors of all IMGs and IPAs contracted with their plan (n = 174 medical directors). We mailed the survey and informed consent, along with a postage-paid return envelope, to these medical directors in September 1997. Two months, later a second mailing was sent to nonresponders. After telephone follow-up by the authors, a third mailing was sent to persistent nonresponders in May 1998, which included a $50.00 cash incentive. This study was approved by our institution's Human Subject Protection Committee.

Descriptive statistics were obtained using SAS statistical analysis software (SAS, Inc., Cary, NC). We compared the organizational structure, implementation of guidelines, quality-assurance programs, and use of systems to increase cancer screening in IPAs and IMGs. We used the chi-square test to assess for differences across categorical variables and the *t* test for continuous variables.

RESULTS

One-hundred twenty-four questionnaires were returned. Six physician organizations dissolved, and four merged with other organizations in our sample. Adjusting our sample for these withdrawals, our overall response rate was 76%. No significant differences were observed in the variables of interest between early responders and late responders.

The medical directors classified 47 of the organizations as IMGs, 56 as IPAs, and 21 as hybrids of the IMG and IPA models. According to the medical directors' descriptions of the hybrids, 17 of these organizations consisted of an IMG and an IPA contracting with HMO insurance plans as one unit, two were physician practice management companies, one was an IPA with several clinics owned by the IPA, and one consisted of multiple large medical groups under one umbrella organization. Because the hybrid organizations and the IPAs were not significantly different with respect to the variables of interest, we combined the hybrids and the IPAs together for these analyses. From this point on, we refer to them simply as IPAs.

Whereas IPAs and IMGs were similar in terms of the degree of managed care penetration, they differed significantly with respect to many important structural characteristics (Table 1). The mean number of capitated lives and the percentage of all patients for which the organization received a capitated payment was not significantly different for IPAs and IMGs (see Table 1). The mean number of physician members was much greater for IPAs than for IMGs. IPAs had many more practice sites than IMGs, although the mean of the longest distance between practice sites was not significantly different for IPAs and IMGs. Not surprisingly, IMGs were much more likely to have a shared system of medical records (a single common chart, standardized format for the medical record, or electronic data for a portion of the medical record) than IPAs. However, none of the IPAs or IMGs had a complete electronic medical record. IPAs and IMGs almost universally had quality-assurance programs, and most had staff who performed quality-assurance activities.

TABLE 1
Characteristics of Physician Organizations

Characteristic	Independent practice associations (n = 77) Mean (SD)	Integrated medical groups (n = 47) Mean (SD)
Descriptive information		
Year established	1987 (± 9 years)	1969 (± 22 years)
No. capitated lives	63,983 (± 146,976)	39,457 (± 33,083)
Patients capitated (%)	58% (± 31)	64% (± 25)
No. physicians**	438 (± 913)	88 (± 149)
Structural characteristics		
No. practice sites	102 (± 222)	7 (± 8)
Longest distance between practice sites (miles)	35 (± 43)	25 (± 27)
Have a shared system of medical records (%)	16	77
Financial arrangements		
Physicians at risk (%)***	45% (± 44)	27% (± 38)
Physician partners (%)*	8% (± 21)	46% (± 38)
Physician employees (%)*	9% (± 21)	53% (± 39)
Quality assurance programs		
Have a QA program	100%	98%
Have QA staff	91%	81%
Audit charts for QA	82%	74%
Have some physician compensation tied to QA performance	21%	19

SD: standard deviation; QA: quality assurance.
* $P \leq 0.001$.
** $P \leq 0.002$.
*** $P \leq 0.02$.

The financial and contractual arrangements of the physician members with the organization were very different for IPAs and IMGs (Table 1). In IMGs, 46% (± 38%) of physicians were partners in the organization, and 53% (± 39%) were employees. In contrast, in IPAs, in which physicians generally maintain their own practices and affiliate mainly for purposes of contracting with HMOs, only 8% (± 21%) of member physicians were partners, and only 9% (± 21%) were employees ($P \leq 0.001$). Physicians in IPAs were more likely to be at financial risk for the care of capitated patients than physicians in IMGs (45% ± 44% vs. 27% ± 38%, respectively; $P \leq 0.02$).

The medical directors reported use of guidelines

TABLE 2
Percent of Independent Practice Associations and Independent Medical Groups That Report Having Guidelines for Preventive Care and Common Medical Conditions

Care/condition	% IPAs (n = 76)	% IMGs (n = 47)
Childhood immunizations[a]	93	96
Hypertension	32	38
Urinary tract infections	17	34*
Mammography screening[a]	93	87
Pap smear screening[a]	91	89
Colorectal carcinoma screening	76	72

IPAs: independent practice associations; IMGs: independent medical groups.
[a] Included in Health Plan Employer Data and Information Set measures.[27]
* $P \leq 0.03$.

in their IMGs and IPAs for many common conditions (Table 2). The most common conditions for which these organizations reported having a guideline were childhood immunizations (93% and 96%, respectively), mammography screening (93% and 87%, respectively), and Papanicolaou (Pap) smear screening (91% and 89%, respectively). Although it was less common than other cancer screening guidelines, 76% of IPAs and 72% of IMGs reported having a guideline for colorectal carcinoma screening. Guidelines for the treatment of hypertension and urinary tract infections, two common medical conditions, were reported less frequently than guidelines for preventive care in these physician organizations.

Most California IPAs and IMGs had some form of office system aimed at improving cancer screening rates (Table 3). However, these activities were reported more frequently for breast carcinoma (86% and 87% for IPAs and IMGs, respectively) and cervical carcinoma screening (79% and 85%, respectively) than for colorectal carcinoma screening (68% and 77%, respectively). The most commonly reported system was a flow sheet or flag in the chart to remind the provider to screen the patient. IMGs were more likely to report using flow sheets than IPAs (64% vs. 44%, respectively, for mammography; $P \leq 0.05$; 66% vs. 45%, respectively, for Pap smears; $P \leq 0.05$; and 62% vs. 38%, respectively, for colorectal carcinoma screening; $P \leq 0.01$). Many IPAs and IMGs reported performing chart audits with feedback to providers about their cancer screening rates. Chart audits reportedly were performed more frequently by IPAs and IMGs for mammography (48% and 40%, respectively) and Pap smears (45% and 40%, respectively) than for colorectal carcinoma screening (38% and 30%, respectively). A mailed reminder to the patient was reported most often for mammography and Pap smears but was reported infrequently for colorectal carcinoma screening. Only a few IPAs and IMGs reported having a computer identify patients in need of screening, a designated staff member to review screening needs with patients, or using health maintenance diaries that are kept by patients. Approximately one-third of IPAs and IMGs that reported using only one office system to improve screening rates, but the rest reported using at least two different office systems (for example, a flag in the chart to remind the provider and a mailed postcard to the patient). Among those physician organizations that reported using multiple office systems, we wondered whether certain types of office systems would be more likely to be used together to create an overall system to increase screening rates. However, there did not appear to be any difference in the frequency of IPAs or IMGs using multiple office systems to improve screening, nor was there any difference between IPAs or IMGs in the distribution of the types of office systems that were used concurrently (data not shown).

The medical directors of California IPAs and IMGs felt that screening was effective at reducing mortality from breast, cervical, and colorectal carcinoma (Table 4). However, they believed more strongly in the efficacy of screening mammography and Pap smears (mean scores of 4.3 and 4.7 for IPAs and IMGs, respectively, on a 5-point Likert scale) than fecal occult blood testing or sigmoidoscopy (mean scores of 3.5 and 3.9, respectively, on a 5-point Likert scale; $P < 0.001$ for all pair-wise comparisons). Almost all medical directors believed that performing screening mammography every 2 years for women ages $\geq$ 50 years and Pap smears every 3 years for sexually active women were reasonable expectations for patients for whom the organization is paid a capitated rate for services (Table 5). Annual fecal occult blood testing with follow-up of abnormal tests also was felt by most medical directors to be reasonable for capitated patients (86% and 96% for IPAs and IMGs, respectively). However, fewer medical directors believed that screening sigmoidoscopy every 5 years for managed care patients ages 50–70 years was a reasonable expectation (71% and 78% for IPAs and IMGs, respectively). We found no association between the number or percentage of capitated patients in the physician organizations and the medical directors' beliefs regarding the reasonableness of routine cancer screening for managed care patients.

DISCUSSION

The current study had several limitations. First, although we sampled IPAs and IMGs from one of the largest HMOs in California, our results may not be generalizable outside of California or to physician or-

TABLE 3
Frequencies of Office Systems Reported to be Used by Independent Practice Associations (n = 77) and Independent Medical Groups (n = 47) to Improve Cancer Screening Rates

	Breast carcinoma (%)		Cervical carcinoma (%)		Colorectal carcinoma (%)	
Office procedure	IPAs	IMGs	IPAs	IMGs	IPAs	IMGs
Have a system to increase screening	86	87	79	85	68	77
Patient reminder letter or postcard	55	47	48	38	16	11
Flow sheet or flag in chart*	44*	64	45*	66	38**	62
Computer identifies patients in need of screening	9	4	8	4	1	2
Chart audit with feedback	48	40	45	40	38	30
Designated staff member reviews screening needs with patients	9	28	13	23	16	23
Health maintenance record or diary maintained by patient	3	9	1	4	1	4
No. of systems in use						
1	26	25	26	34	30	36
2–3	56	51	48	43	38	36
4–5	4	11	5	8	0	4

IPAs: independent practice associations; IMGs: independent medical groups.
* $P \leq 0.05$.
** $P \leq 0.01$.

TABLE 4.
Medical Director Beliefs Regarding the Efficacy of Cancer Screening

Belief	Do screening tests reduce mortality?[a]
Mammography reduces mortality	4.3 (± 0.8)
Pap smear reduces mortality	4.7 (± 0.6)
FOBT reduces mortality	3.5 (± 0.9)
Sigmoidoscopy reduces mortality	3.9 (± 0.7)

[a] 5: a great deal; 1: not at all. Values in parentheses are the standard deviation.

TABLE 5
Routine Cancer Screening Is a Reasonable Expectation for Capitated Patients

Test	IPAs (n = 77) (%)	Integrated Medical Groups (n = 45) (%)
Mammography	95	91
Pap smears	94	91
FOBT screening	86	96
Sigmoidoscopy	71	78

IPAs: independent practice associations.

ganizations that do not have contracts with this plan. Nonetheless, these physician organizations cared for 6.7 million capitated patients, a substantial portion of the managed care population in California, and an important group in which to learn about attitudes and practices to improve cancer screening. Second, this study was based on the self-report of the medical director and may have overestimated the frequency of the use of guidelines and office systems to improve cancer screening in California IPAs and IMGs. In addition, having an organizational guideline or office system for cancer screening does not mean that it has been adopted by individual practices or is used by clinicians. We cannot determine from this study whether the guidelines acknowledged or the office systems used by the IPA and IMG administration are being used by member physicians in their practices. To address this important question, we currently are surveying a sample of the providers to learn whether they report using any organizational guidelines or office systems in their practices.

Cancer screening is a priority for California IPAs and IMGs in this network model HMO. Most IPAs and IMGs in this study have guidelines for screening for breast, cervical, and colorectal carcinoma. In addition, a majority of medical directors report that their physician organizations use a variety of office systems to increase cancer screening rates.

We had hypothesized that IMGs would have more developed office systems than IPAs, because they have more integrated offices and corporate structures. Surprisingly, we found that IPAs and IMGs did not differ overall in their reported use of quality assurance or office systems to improve cancer screening. Physician organizations are mandated by the HMOs with whom they contract to perform quality assurance, and virtually all of the IMGs and IPAs in our study had such programs. The majority of both IPAs and IMGs had staff who performed quality-assurance activities, and approximately three-quarters of both types of physi-

cian organizations performed chart audits to monitor the quality of care. The most commonly used office systems by both IPAs and IMGs to improve cancer screening were flow sheets in patients' charts, mailed reminders to patients, and chart audits with feedback to providers. However, IMGs were more likely than IPAs to use a flow sheet in patients' charts. Because very few IPAs reported having a shared system of medical records between different practice locations, chart-based office systems may be less feasible than in IMGs, in which three-quarters of the groups have shared medical records systems.

The characteristics of the IPAs and IMGs in our study were similar to those reported previously by Kerr et al.[21] and Harris.[22] We found that the mean number of capitated lives was 63,983 patients in IPAs and 39,457 patients in IMGs, corresponding to 58% and 64% of their total patient populations, respectively (the differences between IPAs and IMGs were not significantly different). In 1993–1994, Kerr et al. found that the mean number of capitated patients among California medical groups and IPAs with contracts with a large network model HMO was 31,258, comprising 50% of their patient population. In another study, Harris reported that the mean number of capitated patients in medical groups and IPAs participating in a network model HMO was 32,488 in 1992–1993. The greater numbers and higher percentages of capitated patients reported by physician organizations in our study were expected given the increasing enrollment in managed care plans.

Although 68% of IPAs and 77% of IMGs reported having office systems to increase colorectal carcinoma screening, more physician organizations reported using such methods to improve breast carcinoma and cervical carcinoma screening rates in their organizations. For example, 40–55% of physician organizations reported mailing patients reminders for breast carcinoma and cervical carcinoma screening, whereas only ≈15% said that they sent patients reminders for colorectal carcinoma screening. Kerr et al. found similarly that only 14% of physician organizations reported using reminder systems for sigmoidoscopy screening compared with 35% for screening mammography.[21] These findings may reflect the perception by the leadership of IMGs and IPAs that breast and cervical carcinoma screening has greater efficacy in reducing mortality than colorectal carcinoma screening (as was found in our study). After the publication of randomized, controlled trials showing a survival benefit, the U.S. Preventive Services Task Force first endorsed routine screening for colorectal carcinoma screening in 1996.[23] The Agency for Health Care Policy and Research published evidence-based guidelines that same year recommending colorectal carcinoma screening, ending the substantial confusion in guidelines that had existed previously.[24] In contrast, the first studies showing a benefit from screening for breast and cervical carcinoma were performed in the 1960s, with the first guidelines disseminated in the 1970s,[25,26] although breast and cervical carcinoma screening did not become widespread until a decade later.[27] New evidence and guidelines take many years to diffuse into clinical practice. This may account for the lower perceived efficacy of colorectal carcinoma screening as well as less frequent use of guidelines and office systems compared with mammography and Pap smears in our study. The cost of colorectal carcinoma screening may be another factor that contributes to less frequent use of office systems for this condition, because ≈ 25% of all medical directors did not consider that routine sigmoidoscopy was a reasonable expectation in a capitated environment.

Alternatively, the heavier emphasis on office systems to increase screening mammography and Pap smear rates may be a response to requirements for accreditation for HMO plans. The National Committee for Quality Assurance (NCQA) publishes an HMO report card called the Health Plan Employer Data and Information Set (HEDIS). HEDIS includes measures of Pap smear and mammography screening rates for participating health plans.[28] Health plans, in turn, may require IMGs and IPAs to report their performance on these two measures to monitor their adherence with these standards and to ensure that the HEDIS results for the HMO as a whole will be favorable. The HEDIS emphasis on breast and cervical carcinoma screening may provide more incentive to introduce office systems to improve rates of Pap smears and mammography than colorectal cancer screening.

Having guidelines or office systems does not assure that they are in use at IPAs or IMGs or that cancer screening is performed according to the guidelines. Although many studies have examined the effects of interventions designed to increase cancer screening in a research setting,[29–31] little is known about the impact of guidelines and office systems on routine medical practice. In addition, researchers have not demonstrated consistently that physicians will recommend screening to their patients even when they agree with cancer screening guidelines. In a recent study in which there was virtually complete agreement among medical directors that primary care providers should regularly discuss Pap smear screening with their patients, the authors found 83% compliance with Pap smear screening by chart audit in California IPAs and IMGs.[22] However, in a survey of primary care physicians in Allegheny County,

Pennsylvania, whereas 88% of respondents agreed completely or partly with the American Cancer Society guidelines for screening sigmoidoscopy, only 34% reported regularly referring patients for the test.[32] The current study was based on the self-reported practices of IPAs and IMGs by their medical directors. Therefore, we cannot determine from these data alone whether the guidelines and office systems for cancer screening actually are being used by providers or are effective in improving screening rates in those organizations that reported having them. However, we currently are surveying the providers participating in these IPAs and IMGs regarding their knowledge of guidelines and their use of office systems, and, in the next phase of this research, we plan to conduct a chart audit to obtain data on the actual screening rates in these physicians organizations.

The medical directors who participated in this survey reported marked differences in the financial and contractual arrangements of IPAs and IMGs with their physician members. Very few physicians in IPAs were partners or employees in the organization, whereas a majority of physicians in IMGs were employees or partners. Physicians in IPAs were almost twice as likely as physicians in IMGs to be at risk financially for their patients' care. Some researchers have expressed concern that financial risk at the physician level may be an incentive to limit necessary care, although a recent study did not find any difference in annual number of office visits or hospital days per year according to the compensation method of the primary care provider.[33] However, preventive care may be more susceptible to the compensation method of the primary care provider, because it may not be viewed as an imperative by the physician or the patient. In January 1998, the Health Care Finance Administration (HCFA) began reimbursing for an annual fecal occult blood test and screening flexible sigmoidoscopy every 4 years for all Medicare beneficiaries ages 50 years and older.[34] This may serve as an incentive for physicians to offer screening to this patient population, at least among the physicians who are reimbursed directly by the payers and not by the IMG or the IPA. Given the varied and complex financial arrangements that IPAs and IMGs have with member physicians, it is not clear what impact if any the introduction of Medicare reimbursement will have on colorectal carcinoma screening for non-Medicare patients, Medicare patients in managed care plans, or Medicare patients for whom the IMG or IPA serves as a financial intermediary between the HCFA and their physicians.

Managed care organizations attempt to influence the use of health care services and the quality of care by using guidelines, office systems, and financial incentives. Hillman has emphasized the need to balance these rules and incentives to meet the goal of providing high quality, cost-effective care.[35] However, little is known about how these growing systems of rules and incentives interact to affect the care that patients receive. We found that most IPAs and IMGs in California report using both guidelines and office systems to improve their cancer screening rates. Further research is needed to understand the effect of these systems as well their complex interactions with competing incentives on cancer screening in managed care.

We will be using the results of this study to develop a comprehensive intervention using quality improvement techniques at the organizational level to increase colorectal cancer screening. We will be testing this approach in a randomized, controlled trial comparing baseline rates with colorectal cancer screening rates at 2 years after the implementation of our intervention in these California IPAs and IMGs. The existing organizational structures of these IMGs and IPAs with large managed care populations, along with their commitment to cancer screening and prevention, make them a unique laboratory in which to test a quality improvement intervention targeted at colorectal cancer screening.

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