Health Policy Review

Economic Impact of Converting an Interventional Pain Medicine Physician Office-Based Practice into a Provider-Based Ambulatory Pain Practice

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Background: One consequence of the shifting economic health care landscape is the growing trend of physician employment and practice acquisition by hospitals. These acquired practices are often converted into hospital- or provider-based clinics. This designation brings the increased services of the hospital, the accreditation of the hospital, and a new billing structure verses the private clinic (the combination of the facility and professional fee billing). One potential concern with moving to a provider-based designation is that this new structure might make the practice less competitive in a marketplace that may still be dominated by private physician office-based practices. The aim of the current study was to evaluate the impact of the provider-based/hospital fee structure on clinical volume.

Objective: Determine the effect of transition to a hospital- or provider-based practice setting (with concomitant cost implications) on patient volume in the current practice milieu.

Setting: Community hospital-based academic interventional pain medicine practice.

Study Design: Economic analysis of effect of change in price structure on clinical volumes.

Methods: The current study evaluates the effect of a change in designation with price implications on the demand for clinical services that accompany the transition to a hospital-based practice setting from a physician office setting in an academic community hospital.

Results: Clinical volumes of both procedures and clinic volumes increased in a mature practice setting following transition to a provider-based designation and the accompanying facility and professional fee structure. Following transition to a provider-based designation clinic visits were increased 24% while procedural volume demand did not change.

Limitations: Single practice entity and single geographic location in southeastern United States.

Conclusions: The conversion to a hospital- or provider-based setting does not negatively impact clinical volume and referrals to community-based pain medicine practice. These results imply that factors other than price are a driver of patient choice.

Key words: Economics of interventional pain medicine, hospital-based ambulatory practice, provider-based ambulatory practice, physician-office based practice, price in-elasticity of health care

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Following passage of the Affordable Care Act (ACA), the concept of the Accountable Care Organization (ACO) has encouraged health systems and providers to align themselves into functional clinical units that will be viable as our health care system moves into new delivery models. One byproduct of this realignment has been recognition that some providers will no longer be able

to meet requirements for independent practice and are selling/merging their practices into larger health care institutions and hospitals. Hospital systems, eager to create the needed care networks, are actively buying these assets (1,2). As a result, many former physician office-based (PO) practices are becoming hospital ambulatory clinics designated as a provider-based (PB) clinic by Centers for Medicare and Medicaid Services (CMS).

While there are many regulatory, clinical, and compliance differences between these 2 designations that are beyond the scope of the current discussion, from a patient billing standpoint there is one significant difference. In the PO model the patient is billed for the professional service rendered only with a copayment due at time of service. Patients receive 2 separate bills in a PB clinic: 1) a professional fee from the medical provider, and 2) a facility charge because the ambulatory service occurs in a hospital setting. The additional facility fee is justified because of the increased level of care provided as required by hospital accreditation standards. For example, a PB clinic is required during each visit to update the complete medication and problem list which often yields improved understanding of overall care to the physician but does increase demands on clinic support staff. Procedures performed in a PB clinic have the safety net of the hospital care system in place should an unforeseen complication occur, whereas the PO clinic does not have this immediate backup available.

Although there are certainly merits to both sites of service, many health care systems are converting their acquired PO-based practices to PB because a mixed environment creates inconsistencies in compliance with regulatory standards. For example, a nurse working in a mixed PO and PB designation area must follow Joint Commission standards when working in the PB area of the facility but no such requirement exists for the PO section. Additionally, regulations state that a patient must be aware when they are moving from PO to a PB setting as they move throughout a facility. It is easier to be in compliance if there are no mixed settings.

Physicians and administrators may voice concerns that the new 2-price structure could lead to decreased clinical volume because of patient defection to non-PB settings. This is a logical assumption since with most purchased products increases in price lead to decreases in demand if there are alternatives. Fears of reduced clinical volume resulting from a higher combined fee may be based on the familiar concept of price elasticity of demand. A market demand schedule for physician office visits shows the relationship between price and quantity demanded during a particular period, all other things held constant. Changes in quantity of office visits demanded in response to changes in price are reflected in movements along the demand schedule. Health care economists define the price elasticity of demand as the percentage change in quantity demanded resulting from a given percent change in price (3). Price elasticity values are negative because prices and quantities demanded move in opposite directions. The concern is that a higher fee associated with the PB clinic, all else equal, will lead to a reduction in clinical volume.

There are 2 reasons why concerns over reduced clinical volume may not be warranted. First, patients perceive few substitutes for health care and do not pay the full price when they have insurance so their purchases are not price responsive. A number of studies have explored the price elasticity concept (3-20). Price elasticity studies by their nature must involve large samples of subjects to determine movement along a demand curve. Studies for small market segments such as the specialty of interventional pain medicine have not been done. What can be extrapolated from these studies is that price elasticities for medical care tend to be in the inelastic range, indicating, for example, that a given percentage increase in price will lead to a smaller percentage decrease in quantity demanded. According to a recent study, market demand price elasticities range between -0.034 for emergency room and hospital services to -0.20 for office visits (19). With a price elasticity value of -0.20, a 10% increase in price would reduce patient volume by no more than 2.0%. These studies are reassuring from a decision support standpoint suggesting only modest reductions in clinical volume (i.e. patient encounters) resulting from the price increase alone based on the best available evidence. Conversely several of the studies which form this view are decades old and theoretically could no longer apply to the current economic climate.

Second, factors other than price may play a more important role in determining clinical volume. A change in any one of the variables held constant in constructing the demand schedule will affect quantities demanded at each and every price. Effects of changing non-price variables are represented by shifts in the demand schedule rather than movements along it. When patients decide to purchase more office visits at a given price than they did before, their demand is said to have increased, or shifted rightward. Factors that influence

this demand increase are known as exogenous demand shifters. Examples of market demand shifters include changes in income and prices of related goods and services. Greater demand can boost clinical volume even at the higher fee. The specific aim of the current study is to determine whether a change from a PO fee structure to a PB fee structure (all other variables staying the same) will affect demand for clinical services by comparing CPT code volumes for the year prior to and following transition. Additionally, an analysis of differences in reimbursement for site of service will be discussed.

Methods

Our project was classified as an exempt study by the Institutional Review Board. We examined changes in clinical volume expressed as frequency of CPT codes documented and third party reimbursements that took place in the clinic before and following the transition to a PB practice in an academic community-based hospital. Clinical volume and charges by CPT code were obtained for 12 months prior to and 12 months following the transition of the interventional pain practice from a PO clinic to a PB clinic. The practice of interventional pain at our institution encompasses services typically offered for this specialty nationally and include new patient visits (denoting a new referral to the center) and follow-up visits, as well as interventions including injective therapies and implantable therapies (spinal cord stimulation and intrathecal drug delivery). The nature of services provided by the center did not change during the study period.

The variables measured were the changes in clinical volume as measured by total CPT codes for the 20 most common clinical services given the incremental increase in price concomitant with a change from PO-based to PB-based designation. Variables held constant were the number of providers (1.2 FTE) and clinic staff (4.5 FTE), the referral base, insurance network affiliations, and systems by which the patient could access our services (call centers, referral systems). Additionally, no changes were made to clinic processes that would increase ease of access such as a new location or after hours care, etc. A conversion to PB clinic does require a complete review of medications and problem list with each patient visit, but this process was already in place in our center due to our established clinical model. In other words no major system/process changes or marketing efforts were made that would account for increase or decrease patient access or volume during the study period. Dollar values noted for clinical services are actual reimbursement rates by payers rather than institutional charges.

Data represent true payments for services rather than billing data which are often significantly higher than actual collections. All values noted as Medicare are CMS published United States Medicare payments for each CPT code. Commercial reimbursement figures represent the average for all commercial payers contracted with our institution. Absolute differences and percentage changes in clinical volume over the FY12-13 period were calculated for each code. Reimbursement trends by US Medicare and commercial payers were analyzed in a similar manner.

Statistical analysis was performed using Stat Tools (Palisade Corporation, Ithaca, NY) for one way ANOVA and regression analysis. Significance was set at $P \leq 0.05$. Regression and correlation analysis performed evaluates the relationship between price and volume for the collected and reported data sets.

Results

Payer mix in data not shown in table format for the studied interventional pain medicine practice were 50% Medicare, 40% commercial payers (to include worker's compensation payers), and 9% Medicaid which was not included in the analysis. The remaining patient volumes also not reported represented self-pay and other payers such as TriCare and prison contracts which represent a small volume of patients.

Table 1 presents data on clinical volume and percentage changes over the FY12-13 period for procedural codes that comprise 95% of the most commonly performed services. All but one procedure code and 3 of 5 E&M codes experienced increases in clinical volume after the transition to a PB setting. Total New Patient Encounters increased by 38.7%, while Total Established Patient Encounters rose by 30.6% resulting in a 33.7% increase in Total E&M encounters. Within the data sets, new patient visits increased substantially as did facet interventions within the procedural data sets. These increases in volume however did not result in a statistically significant change in clinic volume for Total E&M or Total procedural patient encounters (E&M encounters $P = 0.3.15$; CI = 95% and procedure encounters $P = 0.438$; CI = 95%). Fig. 1 shows visits per day on a monthly basis for FY 13 versus FY 12 were statistically significant ($P < 0.001$; CI 95%). The daily increase in patient visits were the result of increases in referral activity accounting for the incremental change in daily volume reported as clinic visits in FY13. There

Table 1. *Quantity and percent change in clinical volume.*

Code	Description	FY 13 Quantity	FY 12 Quantity	% Change
Procedure Codes				
62311	Lumbar/Caudal Epidural Injection	484	463	4.5%
64636	Radiofrequency Ablation Facets Additional Level(s)	272	139	95.7%
64493	Facet Injection Single Level	178	164	8.5%
64494	Facet Injection Second Level	173	156	10.9%
64495	Facet Injection Third Level	147	124	18.5%
64635	Radiofrequency Ablation Facets First Level	132	49	169.4%
62310	Cervical Epidural Steroid Injection	129	128	0.8%
20553	Trigger Point Multiple	93	49	89.8%
20610	Major Joint Injection	84	42	100.0%
77002	Image Guidance for Joint Injection	84	36	133.3%
64634	Cervical Facet RF Additional Level(s)	72	58	24.1%
20552	Single Muscle Trigger Point	63	38	65.8%
63650	Spinal Cord Stimulator Lead	60	45	33.3%
64490	Cervical Facet Injection 1st level	57	51	11.8%
77003	Image Guidance for Spine	54	62	-12.9%
E&M Codes				
99204	New Patient Level 4	971	664	46.2%
99203	New Patient Level 3	151	145	4.1%
Total New Patient Encounters		1,122	809	38.7%
99214	Established Patient Level 4	2,088	1,193	75.0%
99213	Established Patient Level 3	1,140	1,167	-2.3%
99212	Established Patient Level 2	78	172	-54.7%
Total Established Patient Encounters		3,306	2,532	30.6%
Total E&M Encounters		5,550	4,150	33.7%

Fig. 1. *This figure represents total visits per day per FTE physician in the interventional pain center averaged over the course of the 18 – 20 day month. The comparison is for each FTE physician (working 9 hours day, 5 days per week, 48 weeks per year) demonstrating programmatic growth year over year despite the increased cost associated with PB transition.*

were individual procedures that increased significantly (facet interventions) though analysis could reveal no specific cause other than random chance of referral with a diagnosis of lumbosacral spondylosis. Collectively the results suggest that the moderate demand increase experienced during the transition year to a PB setting more than offset any reduction in quantity demanded that would be associated with the higher combined fee. This finding is encouraging for any practice that is evaluating the decision to become a PB clinic and suggests that price may not be a major driver of demand for services.

Table 2. reports US Medicare reimbursements by code for the PO practice and the hospital-based practice. Payment figures are shown for PO visits (ProNF), hospital-based practice (ProF) visits, and the hospital facility fee (Tech). The total reimbursement figure column combines physician payments in a hospital setting (ProF) with the hospital facility fee (Tech). Differences in hospital-based and PO reimbursements and percentage changes are reported in the final 2 columns.

Total US Medicare reimbursements exceed PO payments for all but 2 codes because of the added hospital facility fee. Two codes have the same hospital-based and PO reimbursement because the hospital does not charge a facility fee in these cases. Absolute and percentage differences between total payments and PO payments are generally quite large. Interestingly though US Medicare payments are generally accepted to be less than commercial payers, the differences on the whole are not statistically significant (P = 0.932, CI = 95%).

Table 3 reports commercial reimbursements by code for the PO practice and the hospital-based practice. Commercial reimbursements for each code are expressed as the average for all commercial payers. Total commercial reimbursements exceed PO payments for all of the codes. Absolute and percentage differences between total reimbursements and PO payments are large for all codes. Comparisons of payments in Tables 2 and 3 show total commercial reimbursements exceed total US Medicare reimbursements for all but one

Table 2. *US Medicare reimbursements*.

Procedure Codes	Physician Office Reimbursement	PB Reimbursement				
	Pro NF	Pro F	Tech	Total	Difference	% Change
62311	$192.08	$84.80	$529.32	$614.12	$422.04	219.7%
64636	$152.60	$55.70	$529.32	$585.02	$432.42	283.4%
64493	$165.83	$87.60	$529.32	$616.92	$451.09	272.0%
64494	$82.30	$49.70	$170.85	$220.55	$138.25	168.0%
64495	$82.60	$50.29	$170.85	$221.14	$138.54	167.7%
64635	$371.50	$205.84	$801.53	$1,007.37	$635.87	171.2%
62310	$228.21	$104.05	$529.32	$633.37	$405.16	177.5%
20553	$59.61	$40.35	$170.85	$211.20	$151.59	254.3%
20610	$55.73	$42.99	$170.85	$213.84	$158.11	283.7%
77002	$25.96	$25.96	$0.00	$25.96	$0.00	0.0%
64634	$169.52	$63.43	$170.85	$234.28	$64.76	38.2%
20552	$51.21	$35.80	$170.85	$206.65	$155.44	303.5%
63650	$411.07	$411.07	$4,116.51	$4,527.58	$4,116.51	1001.4%
64490	$183.80	$103.49	$529.32	$632.81	$449.01	244.3%
77003	$28.89	$28.89	$0.00	$28.89	$0.00	0.0%
E&M Codes						
99204	$153.16	$121.45	$120.21	$241.66	$88.50	57.8%
99203	$99.90	$71.16	$90.72	$161.88	$61.98	62.0%
99214	$99.23	$72.86	$90.72	$163.58	$64.35	64.8%
99213	$67.39	$47.24	$68.94	$116.18	$48.79	72.4%
99212	$40.17	$23.28	$68.94	$92.22	$52.05	129.6%

Table 3. *Commercial reimbursement.*

	Physician Office Reimbursement	PB Reimbursement				
Procedure Codes	**Pro NF**	**Pro F**	**Tech**	**Total**	**Difference**	**% Change**
62311	$297.49	$297.49	$505.77	$803.26	$505.77	170.0%
64636	$169.65	$58.95	$802.78	$861.73	$692.08	407.9%
64493	$182.04	$112.33	$547.77	$660.10	$478.06	262.6%
64494	$88.79	$64.83	$501.10	$565.93	$477.14	537.4%
64495	$90.13	$66.16	$501.10	$567.26	$477.13	529.4%
64635	$408.41	$219.48	$984.80	$1,204.28	$795.87	194.9%
62310	$303.41	$303.41	$505.77	$809.18	$505.77	166.7%
20553	$91.79	$70.72	$213.42	$284.14	$192.35	209.6%
20610	$150.53	$79.73	$255.00	$334.73	$184.20	122.4%
77002	$36.77	$36.77	$207.91	$244.68	$207.91	565.4%
64634	$188.63	$67.70	$739.13	$806.83	$618.20	327.7%
20552	$91.79	$70.72	$201.12	$271.84	$180.05	196.2%
63650	$619.34	$619.34	$929.22	$1,548.56	$929.22	150.0%
64490	$201.13	$132.32	$547.77	$680.09	$478.96	238.1%
77003	$39.10	$39.10	$607.17	$646.27	$607.17	1552.9%
E&M Codes						
99204	$178.17	$141.69	$150.26	$291.95	$113.78	63.9%
99203	$122.73	$96.00	$116.75	$212.75	$90.02	73.4%
99214	$111.44	$83.48	$71.71	$155.19	$43.75	39.3%
99213	$75.14	$54.35	$61.95	$116.30	$41.16	54.8%
99212	$48.33	$32.93	$52.19	$85.12	$36.79	76.1%

procedural code and for 3 of 5 E&M codes. Percentage increases in Total US Medicare reimbursements relative to PO reimbursements are higher for 1 of 20 codes than corresponding figures for commercial reimbursements.

Table 1 reminds us that clinical volume rose for all but 3 codes despite the added hospital facility fee though these differences are not statistically different suggesting the increases are within the fluctuation that could be seen by random chance. Tables 2 and 3 report large increases in absolute and percentage terms for reimbursements under most US Medicare and commercial codes. Collectively, results reported in Tables 1, 2, and 3 suggest the transition to a PB practice would result in a positive effect on cash flow of the practice and hospital.

Figs. 2 and 3 are the regression and correlation analysis demonstrating no strong link between changes in clinic volume (patients seen for a given procedure) and the price change for that procedure following the change in status of the clinic to PB. While both correlations are negative, the relationship between price and volume are very near zero, suggesting no linear relationship. The regression analysis did not reach statistical significance for the price change/volume change relationship ($P = 0.547$) suggesting that price increases were not an explanatory variable with regard to clinic volume changes.

Discussion

Many physicians are faced with the decision to become hospital employees or remain in private practice as a small business owner. New graduates are finding the transition to practice daunting because of challenges associated with the ACA such as ACO participation and electronic medical records implementation. Since 2009, a growing number of physicians have chosen to practice in a PB environment (21).

This study evaluated the decision to convert a PO practice to a PB practice in an academic hospital by comparing clinical volumes and reimbursements prior to, and following the transition. Clinical volume for many codes rose. Combined reimbursements to the hospital and practice from US Medicare and commercial

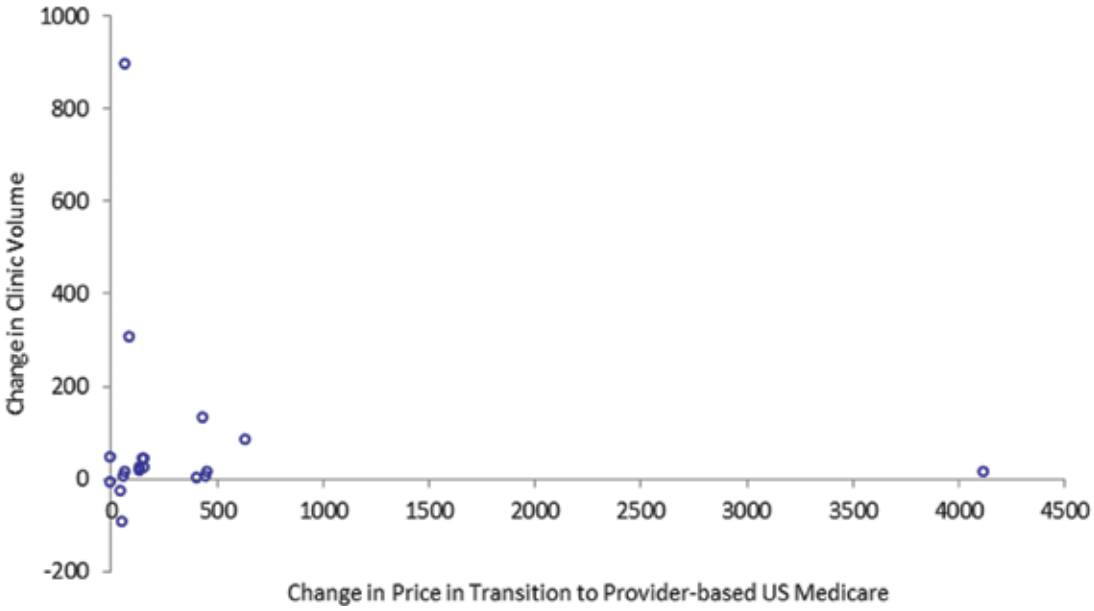

Fig. 2. *Correlation analysis and scatterplot for the change in clinic volume plotted against the change in price for US Medicare. Correlation coefficient – 0.095 suggesting no relationship between price variables analyzed and pre and post conversion to PB setting for patients with Medicare. Data presented on the y-axis are changes in actual clinic visits from FY 2012 to FY 2013. Data presented on the x-axis are changes in price in US dollars ($) representing actual payments for US Medicare rates.*

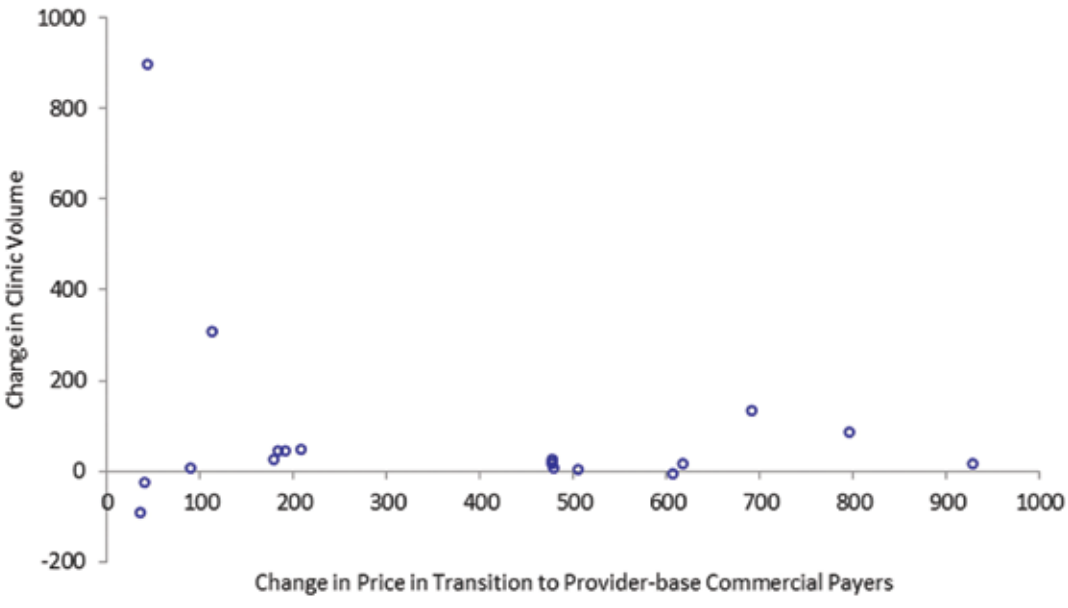

Fig. 3.*Correlation analysis and scatterplot for the change in clinic volume plotted against the change in price for commercial payers. Correlation coefficient – 0.206 suggesting minimal relationship between price variables analyzed and pre and post conversion to PB setting for patients with commercial insurance. Data presented on the y-axis are changes in actual clinic visits from FY 2012 to FY 2013. Data presented on the x-axis are changes in price in US dollars ($) representing actual payments for commercial rates.*

payers rose for nearly all codes because of the added facility fee. Collectively, trends in clinical volume and reimbursements suggest the transition to a PB practice had a positive effect on billing and cash flow of the practice and hospital. Joining a hospital system with an added facility fee did not appear to reduce competitiveness of the pain medicine practice relative to PO practices. Concerns that a higher price resulting from the new price structure would lead to decreased clinical volume and lower reimbursements following transition to a PB setting were unfounded.

There appeared to be no reduction in quantity demanded associated with the additional facility fee resulting in increased overall revenue for the practice. One can speculate as to the drivers of demand other than price. It has been suggested that network referrals are perhaps the biggest factor associated with patient selection of a provider (22). A transition to PB-setting does result in review of medications and problem lists with each visit (by certified medical assistant etc.) which could be perceived as more thorough care. The effect of this process, which is incumbent upon any PB clinic, on patient perception and satisfaction has not to our knowledge been studied. We hypothesize that this process would not prevent loss of patients if price were an issue, or attract new patients, as to some degree one would expect their providers to be thorough. In the future we anticipate that expanded health insurance coverage under the ACA will eventually cause an additional rightward shift of the demand curve.

With regard to hospital systems, the current study provides a perspective that the cost of practice acquisition can be partially offset by the transition to a PB clinic. Hospitals have well established protocols for meeting the requirements of compliance and regulation. Ensuring that these regulations are met in the ambulatory setting is incumbent upon those leading the transition to a PB setting. There may be fears that acquisition of physician practices, each with unique internal business patterns and clinical processes, will present a challenge in establishing compliance. One solution is to bring the physician practice under the well-defined umbrella of the PB clinic model. While this creates standard work for compliance and regulation with which hospitals are familiar, the acquired practice may worry that new regulatory burdens will drive away patients. This study suggests that, at least in the scenario described, this concern is unfounded.

A major implication of our findings relates to system-wide health care costs. As reimbursements decline in the office setting for the specialty of interventional pain medicine, the ACA is effectively encouraging office-based providers to become PB clinics in a hospital setting with an additional facility charge. Unless there is a change in reimbursement structure, the additional fee will contribute to rising health care costs rather than reducing costs. This view is supported by other major physician groups representing interventional pain medicine (23). It is estimated that 40% of interventional pain physicians working in the office setting will consider moving to or choose to move to an ambulatory surgical center or hospital-based practice setting (23). This change alone has been estimated to result in $150 million in extra cost to Medicare (23). Coupled with the potential cost resulting from not dealing with the sustainable growth rate issues, the total impact on US Medicare could be even greater (24).

Limitations of the current study include our focus on one practice, a single specialty (interventional pain medicine) in a defined geographic market, and a short time period under study. Specialties other than pain medicine or pain medicine practices in other geographic markets might have different experiences. Over time, patients would have more opportunity to seek out substitute providers and adjust purchases in response to the higher price. Given that in our practice model, established patients are seen 3 to 6 times per year, it is unlikely large number of patients would leave the practice in subsequent years since the impact of out-of-pocket costs for returning patients would have been realized during the study period.

The current study provides a framework by which practices and hospital systems can see the precedent that a move to a PB model may not impact patient volume, and that such a move might help offset declining revenue or practice acquisition expense. Clearly, further studies into this evolving area of medical economics are warranted.

Conclusions

Our study of changes in clinical volume and reimbursements experienced by an actual clinic suggests that transitioning a PO-based practice into a hospital or PB-based practice is unlikely to reduce patient volume with concomitant increases in charges which could cover the overhead of the hospital-based practice. This finding has implications for the practice of pain medicine and broader implications as physicians and hospitals evaluate mergers in the current health care environment.

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