

Theory and Practice in the Design of Physician Payment Incentives

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THERE ARE MANY MECHANISMS FOR PAYING physicians; some are good and some are bad. The three worst are fee-for-service, capitation, and salary. Fee-for-service rewards the provision of inappropriate services, the fraudulent upcoding of visits and procedures, and the churning of “ping-pong” referrals among specialists. Capitation rewards the denial of appropriate services, the dumping of the chronically ill, and a narrow scope of practice that refers out every time-consuming patient. Salary undermines productivity, condones on-the-job leisure, and fosters a bureaucratic mentality in which every procedure is someone else’s problem. But American medicine exhibits numerous interesting compensation systems that blend elements of retrospective and prospective payment, of fee-for-service, salary, and capitation. These innovations seek a middle ground between high- and low-intensity incentives, between piece rates and straight salary. Payment mechanisms also are embedded in and supported by nonprice mechanisms—i.e., by methods of monitoring and motivating appropriate behavior that may have financial consequences but rely more directly on screening, socialization, profiling, promotion, and practice ownership.

Contemporary policy debates concerning the effects of payment mechanisms on physician practice styles often are based on simplistic assumptions concerning the nature and prevalence of particular methods. Public discussions tend to miss the blending of alternative payment

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approaches and the mixing of price with nonprice mechanisms, which balance and moderate the undesirable incentives that would be generated by undiluted versions of fee-for-service, capitation, or salary alone. The commonalities between payment mechanisms used for physicians and those used for other professions, occupations, and industries are often overlooked as well.

This paper analyzes the changing landscape of physician payment, combining the economic literature on incentive contracting with examples of how physicians are paid by insurers and their own medical groups. It begins with a brief summary of agency theory and the principles of performance incentives in the context of imperfect information, risk aversion, multiple interrelated tasks, and team production efficiencies. The discussion then focuses on the specific goals of physician payment, and on the flawed performance of fee-for-service and capitation in motivating physicians to strive for and achieve those goals. The subsequent section evaluates innovations that blend elements of fee-for-service, capitation, and case rates to preserve the advantages and attenuate the disadvantages of each. These include primary care capitation with fee-for-service carve-outs, specialty department capitation with individual fee-for-service or “contact” capitation, and case rates for defined episodes of illness. The discussion then expands to the context within which payment incentives are designed and implemented, including nonprice mechanisms and organizational structures. The concluding sections highlight implications of the analysis for health services research and public policy, respectively.

Agency Theory and Payment Incentives

Methods of payment constitute a form of incentive contract, linking the individual physician with the larger organization—be it an insurer, a medical group, or a governmental health benefits program. As such, the analysis and interpretation of physician payment falls within the larger economic literature on contracts and financial incentives, known as agency theory (Milgrom and Roberts 1992; Pratt and Zeckhauser 1985; Sappington 1991). The essence of incentive contracting is the effort by one individual or organization (the principal) to induce and reward certain behaviors by another (the agent). Financial rewards are only one, albeit an important one, among a variety of mechanisms for eliciting the desired behavior; other mechanisms include screening, socialization,

and threats of contract termination. It is important to distinguish between the level of payment (the total amount expected to be paid by the principal to the agent) and the structure of payment (the manner in which payment is linked to specific measures of performance). The level of payment ultimately must be set equal to or greater than the compensation that the agent could achieve in other settings and, in the case of physician payment, will be determined by implicit social judgments concerning the expenditures necessary for attracting talented individuals into the profession. The structure of payment, which is the concern here, is designed to provide the highest reward to the agent at the lowest cost to the principal. Variations across occupations and industries in the structure of compensation are interpreted by economic theory as reflecting the characteristics of the tasks and the individuals who perform them, including the extent to which performance is easily monitored and measured, the extent to which individuals are averse to risk, the extent to which the desired behavior consists of one or multiple tasks, and the extent to which cooperation among multiple agents is a central feature of the work to be accomplished (Prendergast 1999).

The simplest form of payment conceptually—one that provides powerful and easily understandable performance incentives—is compensation linked directly to effort, as measured in the number of shirts sewn or boxes of fruit picked. Piece-rate payment is analogous to spot contracting among firms, and aligns incentives well in contexts where the desired behavior is simple and easily monitored (MacNeil 1978). Piece rates can be adapted to quite complex work contexts, so long as the various tasks can be measured individually and compared to one another in a cardinal index. The most obvious example of piece rates in complex settings, of course, is fee-for-service payment for physician services, where the Current Procedural Terminology (CPT) code assigns a unique identifier to (almost) every clinical task and the Resource-Based Relative Value Scale (RBRVS) permits indexing and conversion into dollar units. The striking features of the policies observed in the real world, however, are the rarity of piece rates outside medicine and the prevalence of prospective forms of payment (e.g., capitation), low-powered forms with only weak links between payment and performance (e.g., salary), forms based on relative rather than absolute performance (e.g., promotions), and forms based on very broad outcomes (e.g., partnerships and stock options). The ubiquity of alternative payment mechanisms testifies to the fragility of piece rates in contexts of incomplete information, risk

aversion, and the willingness of agents to pursue self-interest with guile when the opportunity arises.

Piece rates expose the principal to abuse in contexts where the specific actions undertaken by the agent cannot be monitored, measured, or well understood. Here, a piece rate induces the agent to increase the quantity of services provided beyond the minimum necessary to achieve the principal's goals. This matter is intuitively evident to anyone who has hired a construction team on a "time and materials" basis, as distinct from soliciting a fixed bid for a defined job. The insalubrious effects of piece-rate payments in medicine have generated a vast journalistic and scientific literature (Rodwin 1993). Even without egregious malfeasance, piece-rate, cost-plus, and other retrospective forms of payment result in an input-intensive, gold-plated form of service that expends resources as if they had no alternative uses and enjoys life as if there were no tomorrow. Prospective forms of payment—including pre-bid rates for construction, Medicare's Diagnostic Related Group (DRG) system for hospital care, and capitation for primary care services—unlink revenues from costs incurred and hence motivate a more cost-conscious form of production.

Of course, prospective methods of payment exhibit their own characteristic pathologies. To the extent that the costs incurred result not merely from the effort and attentiveness of the agent but from factors outside the agent's control (e.g., macroeconomic demand, weather conditions), prospective payment exposes the agent to new financial risks. Actual payments will exceed the amount necessary to induce the desired behavior if the exogenous factors prove favorable and will fall short if exogenous factors are unfavorable. To the extent the agent is averse to risk, he or she will demand extra compensation for enduring the possibility of a revenue shortfall even if it is balanced by an equal probability of enjoying a revenue windfall. The principal will seek to minimize this risk premium by structuring payment only to reflect the agent's own performance, which shifts the structure of payment back toward piece rates. In most contexts, the optimal payment structure will blend elements of prospective and retrospective payment (capitation and fee-for-service) by mixing base salaries, commissions, bonuses, profit sharing, and innumerable complex and creative devices.

The shifting of risk from principal to agent is threatened by yet another undesirable form of behavior, to the extent that the agent may select from a menu of possible tasks or contexts with different expected costs.

A prospectively fixed payment rate for construction tasks, for example, can induce work teams to refuse jobs on difficult terrain. Prospective payment in health care exposes the provider of services to extra costs, and hence lower net income, for treating patients with more severe underlying disease and greater need for time and services (Newhouse 1996). Prospective payment rates can be adjusted for the expected severity of the patient's illness, as in the case of Medicare's DRG weighting and the age/sex adjustment of physician capitation rates, but these adjustments often account for only a modest percentage of the variation in costs. Incomplete risk adjustment results in payments that are too high for some providers and too low for others. Over time, underpaid providers either exit the market or begin to systematically avoid high-cost patients, while overpaid providers remain in the market and continue to reap undeserved rewards. In medicine, where every physician's patients are sicker than the average, capitation leads to systematic underpayment of the profession.

The design challenge facing the principal is substantially complicated in contexts where the behavior desired of the agent comprises a variety of different tasks, some of which are easily monitored and some of which are not. Attempts to link pay to performance in these contexts will lead to an overinvestment of the agent's time in those tasks that are explicitly measured and rewarded, with a concomitant underinvestment of time elsewhere (Holmstrom and Milgrom 1991). The heterogeneity of tasks accounts for the ubiquity of compensation methods only indirectly linked to immediate performance (e.g., salary, profit sharing). The problems generated by multitask settings do not end here. To the extent that principals seek to avoid incentive distortion by paying agents a set rate for a bundle of services, they create incentives for strategic unbundling and rebundling. Purchasers of "all-inclusive" vacation packages frequently are dismayed by the number of services that subsequently are defined as optional and therefore subject to supplementary fees. Medicare's Prospective Payment System, which bundles all the services provided in a patient's hospital stay into one payment, has induced hospitals to perform testing on an outpatient basis prior to admission and discharge patients "quicker and sicker" to subacute-care and home-care settings (Rogers, Draper, Kahn, et al. 1990).

A final complexity for the design of payment structures occurs where the efforts of one agent must be coordinated with those of other agents.

In contexts of significant team or joint production efficiencies, payment of each individual agent based on a measure of his or her own effort often undermines cooperation. Payment based on team effort or output is possible in some circumstances (e.g., cooperatives) but expose diligent agents to freeloading by their colleagues (Alchian and Demsetz 1972; Gaynor and Gertler 1995). Analogous difficulties arise when the agent's time must be combined with materials and equipment supplied by the principal. Here, piece rates are notorious for leading to waste of materials and abuse of machinery. The incentive problems plaguing joint production contexts sometimes can be alleviated by assigning to one agent the responsibility for monitoring the others, either as supervisor or as the employer or subcontractor. In production contexts involving materials and equipment, the agent may be required to own and supply these inputs personally and then be paid a composite rate that covers his or her time and the value of the other inputs. The private practice of medicine embodies many of these considerations, as the physician or physician partnership owns the practice, employs the nonphysician staff, and is paid a rate that covers physician time, support staff, supplies, office rent, clinical equipment, and related factors.

Fee-for-Service and Capitation

In light of the platitude that physicians do not adjust their clinical practice style in response to payment incentives, it is remarkable that piece rates—the form of compensation that exerts the strongest and most direct influence on behavior—have retained their dominant role in medicine long after they have disappeared from most other occupations and industries. The economic theory of wages and incentive contracting seeks to understand why this most straightforward incentive structure is so uncommonly found, and attributes this rarity to difficulties in measurement, aversion to risk, task complexity, and the importance of cooperation (Baker, Jensen, and Murphy 1988). These task attributes, ironically, are precisely those often ascribed to medicine. There is a lesson here somewhere.

Both the persistence of fee-for-service and the rise of its opposite, capitation for physician services, need to be interpreted in light of the behaviors required of physicians. It turns out that two of the four most important dimensions of physician performance are well served by

piece-rate payment, which explains the persistence of fee-for-service; the other two are poorly served by piece rates, and hence explain the rise of capitation. The salience of all four features ultimately explains why neither fee-for-service nor capitation, in their pure forms, are optimal forms of payment for physician services and will be outperformed by payment methods that blend elements of retrospective and prospective payment. The four key features of clinical practice, in terms of economic incentives, are:

- *Physician productivity and patient service.* Medicine remains in many ways a one-to-one service profession, where physicians should be encouraged to work long hours, perform many procedures, and be attentive to the needs and preferences of each individual patient. Fee-for-service is ideally suited to this dimension of medicine, since it pays more to physicians who do more and less to those who do less. Capitation performs poorly here, since its payment is determined prospectively without regard to the number of services provided, overpaying physicians who stint on care and underpaying those who provide many complex services.
- *Risk acceptance.* Physicians should receive extra praise and compensation for treating the sickest patients and should not be rewarded financially for skimming the healthy and avoiding the ill. Fee-for-service performs well on this dimension of medicine, since physicians receive more fees for treating the sicker patients who need more care and fewer fees for treating healthier patients who need less. Capitation performs poorly on this criterion to the extent it is imperfectly adjusted for the severity of illness of each covered patient. Even a well-adjusted capitation payment rate fails to compensate physicians who treat patients whose condition deteriorates, leading to greater utilization and cost, for reasons independent of the physician's own actions.
- *Efficiency and appropriate scope of practice.* Physicians should be rewarded for steering between the shoals of undertreatment and the rocks of overtreatment, for providing the appropriate level of care in the appropriate setting and for maintaining an appropriate scope of practice. Here, we begin to see the limitations of fee-for-service and the offsetting advantages of capitation. Piece-rate payment encourages the provision of unnecessary treatment, of care in high-cost settings (if this conserves on the physician's personal time), of care

by specialists (who do more and are paid more than generalists for the treatment of similar patients), and for a scope of practice that may be overly broad (every referral is a lost fee). Fee-for-service is especially inflationary in the context of physician oversupply; there is nothing more expensive than an underemployed specialist. Capitation and other prospective forms of payment offer a financial antidote to this supplier-induced demand, as proved in innumerable studies of the British National Health Service, health maintenance organizations, prepaid group practices, and capitated physicians in independent practice association contexts.

- *Cooperation and evidence-based medicine.* Physicians should be encouraged to cooperate with other clinicians, to adopt evidence-based best practices, and to narrow the unjustifiable variations in how similar patients with similar conditions are treated across the health care delivery system. Here again, fee-for-service is counterproductive, providing no compensation for collaborative discussion, protocol adoption, or the development of practice styles less dependent on physician office visits (e.g., telemedicine, e-mail, health education classes, nonphysician clinicians). Capitation, as a population-based form of payment, offers the potential for stimulating attention to epidemiological patterns of illness and care, of being buttressed by clinical protocols defining which form of care is expected in which context, and of encouraging resource-conserving practice innovations.

Empirical Studies of Physician Payment

The complex and rapidly changing organizational and contractual environment of physician payment does not lend itself to easy study. Analyses have been plagued by incomplete data, thorny methodological challenges, and inadequately developed conceptual frameworks. Due to time and space limitations, surveys often restrict themselves to simple questions (“Are physicians paid fee-for-service, capitation, or salary?”) despite the recognized existence of hybrid and blended payment mechanisms. The observed association between payment mechanism and physician behavior often is confounded by endogenous and poorly measured non-price features of the relationship, ranging from physician and patient self-selection to monitoring mechanisms and group culture. Some

studies fail to identify clearly the organizational context within which the physician practices, leading to confusion between the payment mechanism used by the insurer and the payment mechanism experienced by the physician, since the intermediary role of the medical group in structuring individual compensation is ignored.

Despite these limitations (Hillman, Welch, and Pauly 1992; Gold, Nelson, Lake, et al. 1995), the peer-reviewed literature generally supports the presumption that payment incentives do affect physician behavior and in the predicted direction. Fee-for-service encourages and capitation discourages resource consumption; productivity-based pay encourages and salary undermines productivity (Hellinger 1996). The most recent studies are able to distinguish the effects of payment methods for physician organizations from incentives for individual physicians working in those organizations (Lake, Gold, Hurley, et al. 2000). Results are mixed, however, with one leading study reporting no impact by either form of payment structure on physician practice style and another finding significant effects in the anticipated direction (Conrad, Maynard, Cheadle, et al. 1998; Kralewski, Rich, Feldman, et al. 2000).

Blended Methods of Payment

The economic literature on incentive contracting outside medicine highlights methods of payment that blend elements of prospective and retrospective payment, such as base salary with performance bonus, sales commission, or profit sharing. Contracts between firms often manifest an analogous nonlinear or two-part structure, such as lump-sum payment for dedicated capacity plus supplemental payment for each unit purchased. Blended methods of payment also are found in health care, especially when one looks under the surface to see how the incentives really work (Ellis and McGuire 1993). Medicare's DRG system provides payment ostensibly on a prospective basis, but in fact it includes a strong element of retrospective payment, since patients are assigned to "diagnostic" groupings, depending in considerable part on which surgical procedures they receive (McClellan 1997). As the health care marketplace becomes increasingly competitive and cost-conscious, the offsetting advantages of fee-for-service and capitation are generating blended methods of payment for physician services.

Capitation with Fee-for-Service Carve-outs

Fee-for-service payment for primary care encourages return visits, testing on equipment owned by the practice, referral to radiology centers and clinical laboratories in which the physician has an ownership stake, and the “upcoding” of visits and procedures to maximize reimbursement. One of the first changes implemented by managed care organizations—whether insurance firms or physician entities, such as independent practice associations (IPAs)—has been to shift generalists to capitation for the services they provide. Generalists are not capitated for the cost of the services provided by referral specialists and facilities, though they may be eligible for a modest bonus based on downstream costs. Capitation improves the efficiency of primary care practice by divorcing revenues from costs incurred, and thereby harnessing the most basic and powerful of human economic proclivities—namely, to spend one’s own money with more care than one spends someone else’s.

Primary care capitation was very successful in constraining the growth in primary care costs, as evidenced by its widespread adoption by U.S. insurers and its retention by the British National Health Service. Over time, however, its advantages seem to have declined and its disadvantages have come to the fore, and we are entering a phase during which a greater fraction of primary care services is being reimbursed again on a fee-for-service basis. The health services research literature has devoted much attention to the difficulty in adjusting capitation payment adequately to reflect the diversity in disease severity among patients, which leads to incentives for adverse selection and patient dumping (Newhouse 1994; Giacomini, Luft, and Robinson 1995). Insurers and IPAs often have different views of the primary liability of this prospective payment method. Variations in disease severity may not be a major problem because age/sex adjustments and stop-loss provisions combine with the law of large numbers to attenuate statistical risk, and since primary care physicians rely on the referral mechanism to shift the highest-cost procedures out of their practices. Rather, users of primary care capitation point to the payment method’s insensitivity to variations among physicians (rather than patients) in clinical practice styles and the resultant tendency to overcompensate physicians who maintain a narrow scope of practice and underreward those who maintain a broad scope of practice. Scope of practice is a choice variable for primary care physicians and differs extensively, with severalfold variations among primary care

physicians in the average costs (measured in RBRVS units) per patient per month. Capitation creates a selection mechanism that attracts physicians who prefer a narrow scope of practice and an incentive mechanism that encourages physicians to narrow their practice scope continually, thereby contravening the general preference among managed care organizations for a style of care based on preventive and primary care services. Capitation may even convert primary care physicians into triage agents, for whom the only significant task is deciding which specialist will receive the referral for which patient. At the extreme, physician capitation can engender the behavior pattern so acutely described by the early health services researcher, Huckleberry Finn (Twain [1884]): “Well, says I, what’s the use you learning to do right when it’s troublesome to do right and ain’t no trouble to do wrong, and the wages is just the same?” (1981, p. 89).

One obvious solution to the liabilities of capitation is to revert primary care physicians from capitation back to fee-for-service, typically at the same moment specialists are converted from fee-for-service to capitation. Reverse capitation of this form, to say nothing of a reversion to fee-for-service for both primary and specialty care physicians, reopens the door to churning, upcoding, excessive testing, and the well-known pathologies of unmanaged care. It demands nonprice controls on utilization, such as gatekeeping and concurrent review—precisely the forms of clinical second-guessing that enrage physicians, patients, and politicians. The alternative form of compensation for primary care physicians consists of blended payments, with which insurers, integrated delivery systems, and IPAs are now experimenting (Hanchak, Schlackman, and Harmon-Weiss 1996; Robinson 1999a, b; Casalino 1992). The most common form continues to pay generalists a flat monthly payment per enrolled patient, adjusted for age and sex and limited by stop-loss provisions, but supplements this capitation with fees for specified carved-out services. These fee-for-service supplements provide a retrospective form of risk adjustment (because sicker patients requiring more such services bring in more payments) and encourage a broader scope of practice (because the physician is paid more for doing more). The services most often carved out and paid on a fee-for-service basis consist of vaccinations, mammography, and other preventive and early detection services that are monitored by the National Committee for Quality Assurance and other third parties. (Fee-for-service payment for these services is ironic in light of the oft-proclaimed virtue of capitation in stimulating

prevention and population health.) Office procedures requiring costly supplies, such as injectable medications and durable medical equipment, are paid fee-for-service to offset the disincentive for their provision. Physician visits to patients in nursing homes, subacute-care units, hospital emergency rooms, and home health settings can be paid on a fee-for-service basis to encourage the primary care physician to perform these personally rather than delegate them to others by default. The most important category of carved-out services, however, comprises consultations and procedures that lie on the border of primary and specialty care, and hence are obvious candidates for referral rather than provision by the generalist. Fee-for-service payment here is consciously designed to attenuate the narrowing of the scope of primary care practice. Examples of borderline services include wound care, flexible sigmoidoscopy, well-woman examinations, drainage of abscesses, removal of benign lesions, and arthrocentesis.

*Specialty Budgets with Fee-for-Service
or "Contact" Capitation*

Specialty services are poor candidates for fee-for-service reimbursement since they often are discretionary from the perspective of the physician, as evidenced by the tremendous geographic variation in specialty procedures and hospital admissions (Wennberg and Center for Evaluative Clinical Sciences 1996). In the words of George Bernard Shaw, "That any sane nation, having observed that you could provide for the supply of bread by giving bakers a pecuniary interest in baking for you, should go on to give a surgeon a pecuniary interest in cutting off your leg, is enough to make one despair of political humanity" (Shaw 1913, p. 9). Capitation has been late coming to this sector, since patients cannot be linked to particular specialists on a prospective basis in the manner that they can be expected to choose a primary care physician. But the inexorable rise in health care costs, most of which are initiated by specialists, has spurred experimentation in prospective methods of specialty payment. In some instances, specialty groups are paid on a straightforward per-member-per-month basis to provide specialty services to a defined population of enrolled patients, subcontracting underneath the more globally capitated umbrella of a multispecialty IPA or health plan. The paucity of large single-specialty groups and the preference among consumers for

broad physician choice severely limits this form of direct capitation and has brought to the fore payment methods that blend collective capitation with individual fee-for-service.

Specialty capitation usually begins with the formation of virtual specialty departments that can be assigned a predetermined budget for the visits and procedures performed by member specialists. The health plan or IPA assigns individual cardiologists and orthopedists, for example, to the cardiology and orthopedics departments in their region, thereby creating clinically meaningful subdivisions in the formally undifferentiated physician network. Ideally, individual specialists in these virtual departments will begin to think of each other as collaborators, not simply as competitors, and will elect department medical directors and begin to adopt specialty-specific clinical protocols. The economic function of these departments, however, is to serve as the basis for budgetary discipline. The total amount of money available for physician services is divided first between primary and specialty care and then among the various specialty departments, usually based on several years of prior claims experience. Individual specialists continue to submit claims for payment on a fee-for-service basis to the department or, analogously, to the health plan or IPA that charges the claims against the departmental budget. The amount actually paid for any given claim, however, is adjusted to ensure that the department stays within its budget. This can be ensured, for example, by continually adjusting the conversion factor in inverse proportion to the number of RBRVS units claimed by all departmental specialists during the budgetary time period. This contrasts with traditional withhold policies in that the proclivity of one specialist to churn or upcode claims reduces payments only to physicians in the same specialty department, sparing generalists and the specialists in other departments. Ideally, this improves the cost-effectiveness of the services provided, since peer monitoring and disciplining of inappropriate behavior is easier within specialty lines than across them. It provides a spur to the creation of specialty protocols, the screening and selection of departmental members, cross-specialty discussions of what constitutes an appropriate referral, and, more generally, the first whispers of collective professionalism in what traditionally has been the most autarkic of occupations. Specialty-department capitation is similar in spirit to Medicare's experiments with the volume offset, but involves smaller and more homogeneous groups of physicians (Zuckerman, Norton, and Verrilli 1998).

Specialty-department capitation attenuates but does not eliminate the “overgrazing” of the clinical commons—i.e., the incentive for each specialist to maximize personal revenue by increasing patient visits and procedures, with the understanding that the consequent reduction in unit prices will be spread over the entire department. Some insurers and IPAs seek to extend the principles of blended payments from the department level to the physician level. “Contact” capitation extends prospective payment principles from primary care to specialty contexts, using the initial patient referral from the primary care physician to the specialist as the triggering event (Kennedy and Merlino 1998; Governance Committee 1995). Each unique patient referral brings to the specialist a defined payment and the responsibility to provide all the specialty services required by that patient for a defined period (e.g., three or six months). Extra visits, tests, or procedures do not bring additional revenue, except in the case of predefined major procedures that are carved out of the capitation rate and reimbursed on a fee-for-service basis. Contact capitation typically is embedded in departmental capitation, with the department’s aggregate specialty budget divided by the number of unique referrals to determine the rate per referral, after taking into consideration budgetary set-asides for the carved-out supplementary procedures.

Case Rates for Episodes of Illness

An increasingly popular form of payment for specialty physicians builds on the episode-of-illness payment methodology used for many years in surgical contexts, where the surgeon is paid a set fee for the preoperative workup, the procedure itself, and postoperative monitoring. The new case-rate methods also are analogous to Medicare’s DRG system for hospital payment, where the hospital is accorded a set payment for an episode of care (the admission), and to Medicare’s new prospective payment methods for hospital outpatient services. Case rates provide a means to move beyond fee-for-service in market contexts dominated by broad-panel, open-access managed care products, where capitation is not possible, and also provide a potential remedy for the ills of capitation in markets where prepayment is already in place.

The intellectual foundation of case-rate payment is the distinction between epidemiologic or “probability” risk, on the one hand, and clinical or “technical” risk, on the other (Emery 1999). Probability risk

encompasses the incidence and costs of care that are beyond the control or responsibility of the physician, whereas technical risk encompasses the utilization and costs of services that are under the physician's control. Ideally, probability risk should be spread widely across the population, and hence held by a public or private insurance company, while technical risk should be held by the physician or delivery system that has accepted clinical responsibility for the case. (The patient should be responsible for those costs reflecting aspects of care over which the patient has meaningful choice, such as convenience and amenities). Fee-for-service protects the physician from both types of risk, whereas capitation exposes the physician to both types. Case rates, in principle, allocate probability risk to the insurer (who pays the physician only if the patient needs care, and pays enough to cover the costs of efficient care) and technical risk to the physician, since the case rate is predetermined based on characteristics of the episode and does not reimburse expenditures on a retrospective, cost-plus basis.

Case rates may be developed for episodes of care that involve multiple specialties, facilities, and ancillary services but are most straightforward to implement on a specialty-specific basis. A health plan can develop a cardiology case rate, for example, that covers evaluation and management services, physician fees while the patient is in the hospital or emergency room, in-office tests, and some procedures, but excludes the institutional component of hospital and emergency room costs, laboratory expenses, the use of in-office injectables, and nonoffice testing (e.g., radiology), thereby bundling all the cardiologist's direct expenditures without converting the physician into a budget-holding entity that pays claims to other vendors. The case rate can cover cardiology services for six months, but allow for recalibration of the episode time period if a predefined important event occurs, such as a major complication or a patient-initiated switch of physician. The episode of illness can be triggered by the initial presentation by the patient to the cardiologist, without requiring a primary care referral or health plan authorization (important features for open-access managed care products). Payment is made on a monthly basis, and front-loaded to account for the fact that most resource-intensive tests and procedures occur early in an episode of care. Case rates differ from contact capitation in that the payment rate is fixed (based on severity of illness, complications, and other adjustments) and need not depend on the number of episodes occurring for the health plan's enrollment. However, some health plans or IPAs embed case rates within capitated

or budgeted specialty departments, thereby adjusting the rate paid per case inversely with the number of cases. (This violates the principle of separating probability from technical risk, except to the extent it is believed that the number of episodes reflects procedure churning rather than epidemiological incidence of disease.)

The Limits of Payment Incentives

Even the most sophisticated mechanism for paying physicians merely attenuates and does not eliminate the incentives for overtreatment, undertreatment, and other socially undesirable behaviors created by fee-for-service, capitation, and blends thereof. Moreover, sophistication in the design of payment incentives creates its own pathologies. The limited ability of payment methods to resolve the complex and conflicting sets of problems in health care lead to two related effects: the bias toward simple over complex systems and the reliance on nonprice mechanisms as an important complement to payment incentives.

Despite the theoretical benefits of mechanisms that blend prospective and retrospective incentives into complex hybrid forms, most compensation systems are relatively simple, in health care and elsewhere (Baker, Jensen, and Murphy 1988). Fee-for-service is a linear function of relative value units; capitation is a linear function of patient enrollment; salary is a linear function of hours worked. Simplicity in methods of physician payment is a virtue for several distinct reasons. Most obviously, the administrative costs of designing, negotiating, implementing, disbursing, disputing, and adjudicating complex payment methods impose yet another tax on this overburdened system. Simplicity is especially important in the all-too-frequent context of many independent payers, since comprehension and compliance are undermined when physicians face different incentives from multiple insurers, IPAs, and governmental programs. Simplicity also supports transparency—the ability of not only the physician but the patient, the family, the hospital, the media, the lawyer, and the politician to understand who is getting paid to do what. Although it does impede sophisticated blends, the imperative for simplicity does not drive physician payment into any one particular category, but rather creates an inertial force that favors maintaining the status quo. Fee-for-service retains its prominence in the diaspora of solo practice, salaries are preferred at the Mayo Clinic, and primary care

capitation is the norm in Britain since each method seems familiar, natural, and hence desirable to the affected physicians.

The limits of payment mechanisms explain the importance of non-price methods for motivating appropriate behavior—including screening and selection, explicit prescription of desired performance, monitoring of compliance, and inculcation of norms and cultural expectations (Berwick 1996). In the era prior to managed care, the U.S. health care delivery system relied on rigorous selection and training in medical school, licensure, malpractice law, and norms against fee-splitting and self-referral to stiffen the back of the physician against the incentives in fee-for-service to provide unnecessary services (Arrow 1963). Other nations relied on other mechanisms, such as employment, that moderated the incentives for overtreatment. However, the nonprice mechanisms of the traditional health care system proved incapable of restraining the accelerating spiral in health care costs unleashed by technological innovation and widespread insurance. The experimentation in methods of physician payment under managed care has been accompanied by new forms of selection, monitoring, and socialization.

Screening and Selection

Managed care traces its origins to the prepaid group practices of earlier decades, when medical groups were careful to hire or bring in as partners only physicians who embraced cooperative principles of medical care. As independent practice associations and other loosely constructed networks were established to compete with the prepaid group practices, the extent of physician selectivity declined but remained one tool among others. Credentialing on clinical, cultural, and economic grounds seeks to ensure that the physicians participating in the health plan or medical group embrace the organizational goals of appropriate care, and hence avoid both over- and undertreatment, independent of explicit payment incentives. The creation of physician networks with limited participation creates a supplementary nonprice mechanism through the potential threat of termination. Preemployment screening and the threat of termination are core principles of every employment situation and are applied in a looser fashion to networks of quasi-independent practitioners. It is true that the selection and incentive effects created by credentialing and contracting in a network setting are weaker than those prevailing in

prepaid group practice, and many observers once believed that IPAs would function merely as transitional organizational forms, either consolidating into integrated medical groups or being driven from the market. Consumer preference for broad physician choice, magnified in a context where employer-paid insurance eliminated cost consciousness, produced a contrary effect. Broad network health plans and physician organizations have done better than their more integrated counterparts, thereby reducing the role of screening and selection as incentive mechanisms and increasing the pressure on payment methods to achieve desired forms of behavior.

Clinical Protocols and Utilization Management

Most people in most occupations decide what to do based not on the relative payment attached to particular acts but, rather, in response to being told what to do by a supervisor, manager, or employer. Even the self-employed find their range of options limited by explicit rules and norms that dictate what is to be done, in what manner, and in what order, regardless of the prevailing payment policies. The price mechanism is a marvel of social coordination but finds its match in command and control mechanisms, be they enforced by symphony conductors, traffic police, or university administrators (Hayek 1945; Barnard 1938; Williamson 1985).

Nonprice mechanisms for influencing clinical behavior have achieved unwanted salience in recent decades due to the confluence of cost inflation and the documentation of unjustifiable variations in the manner in which similar patients are treated for similar conditions. Efforts to improve the quality of care, as well as its cost-effectiveness, now invariably include protocols, clinical pathways, and other guidelines as to what physicians should do in particular situations (Shortell, Bennett, and Byck 1998). In some situations, adherence to published guidelines can be expected to increase the cost of care; in others, costs will be moderated. The various principals in the health care system—be they public and private purchasers, health insurance plans, or medical groups and IPAs—have sought to induce physician agents to adhere to these clinical guidelines. The direction of the emphasis typically runs opposite the direction of the prevailing payment incentives, and appropriately so. Health plans and IPAs that pay physicians on a fee-for-service basis, for example, tend

to install utilization review mechanisms that look for and discourage overtreatment. The shift from fee-for-service to capitation was advocated in large part as a means of dispensing with the need for this costly and intrusive second-guessing of physician decision-making. Once in place, of course, capitation created incentives for undertreatment, which is now increasingly accompanied by monitoring mechanisms that search for barriers to appointments, procedures, and referrals. The limitations inherent in these newer forms of monitoring are evidenced by the shift back toward partial or total fee-for-service.

Norms and Cultural Expectations

In a vivid illustration of the limits of payment incentives, all nations rely heavily on socialization and the inculcation of norms of behavior for physicians. While norms and cultural expectations are pervasive across all occupations, medicine seems to be subject to stronger and more explicit codes of conduct. The omnipresent and continuing reliance on socialization is testimony to the effectiveness and, indeed, the indispensable role of this quintessentially nonprice mechanism. The limits of socialization are affirmed with equal eloquence by the ubiquity of complaints across nations and historical periods concerning the quality and cost of medicine and the imperative for new and stronger financial, organizational, and punitive mechanisms to ensure the accountability of the agents to the principals. Closer to home, the best and the brightest among medical educators have sought to stave off regulation of the profession by exhorting medical students to take into appropriate consideration the cost of their clinical actions. The universal failure of these programs constitutes another proximate cause for the rise of managed care and its emphasis on payment mechanisms. Critics of financial mechanisms for influencing physician behavior need to come to grips with the pathologies and weaknesses of nonprice mechanisms for achieving the same objectives, or admit that they do not share the objectives being pursued.

Organizational Structure as Physician Incentive

The limitations of price and nonprice mechanisms help explain the imperfect efficiency, quality, and social accountability of practicing

physicians. This deficiency is in no way specific to the health care sector but is pervasive throughout the economy. Indeed, the limitations of contractual mechanisms are identified by economists as the principal explanation for the observed pattern of organization in the economy (as well as for some aspects of government) and, more specifically, for the pervasive role of proprietorships, partnerships, corporations, and other formalized organizational structures in lieu of continual contracting among independent individuals (Coase 1937; Demsetz 1991; Holmstrom and Tirole 1989).

This is hardly the moment to embark on a discourse concerning health care organization and its relationship to physician payment pathologies (Robinson 1999b). One basic point does deserve to be made, without which the discussion of physician payment here and in the broader world would be seriously incomplete. The limitations of fee-for-service and capitation forms of payment, even if blended into hybrids and supported by nonprice selection and incentive mechanisms, have generated two quite different organizational responses. In this respect, once again, medicine is similar to rather than different from the larger economy. One common response to payment pathologies is to reduce reliance on financial incentives by replacing high-powered mechanisms (e.g., fee-for-service and capitation) with low-powered mechanisms (e.g., salary). Indeed, the pervasive use of salaried forms of payment, supplemented by promotion mechanisms, deferred-compensation mechanisms (e.g., pension plans), and collective incentive mechanisms (e.g., profit sharing), bears eloquent testimony to the liabilities of high-powered payment mechanisms in the real world of imperfect monitoring, multiple tasks, and team production efficiencies. A century of efforts to move physicians from solo practice to employment in multispecialty clinics, from Mayo to MedPartners, finds its origin in the hypothesis that screening, socialization, and formal leadership will outperform payment incentives in motivating appropriate physician behavior. The reluctance of most physicians to join large medical groups, and their passive resistance to productivity targets and clinical protocols once they have joined, bear equally eloquent testimony to the pathologies of formal organization. Whatever evil anyone might say of solo practice, it minimizes hierarchy, internal influence politics, and the free-rider problem that have made the once-neutral term “bureaucracy” synonymous with everything we love to hate about big business and big government.

The limitations of payment mechanisms are responsible for yet another pervasive organizational peculiarity, one diametrically opposed to employment and low-powered salaried payment. Ownership of practice assets, either individually or in a partnership, creates an extremely high-powered set of performance incentives, but one that is not linked in any simplistic fashion to the number of procedures performed or patients enrolled (Hart and Moore 1990). Ownership creates of the physician the residual claimant to the financial flows of medicine, the one who enjoys the profits when revenues exceed costs and who bemoans the losses when costs exceed revenues. Stock options and profit sharing pale next to true proprietorship, the ownership of all stock and the full share of all profits. The resilience of solo and small-group practice in medicine testifies to the importance of financial incentives to stimulate productivity and, simultaneously, to the incompleteness of the CPT index and the RBRVS fee schedule to measure and reward the full range of physician services. Doctors who conduct rounds in the nursing home, return patient phone calls after hours, and appear polite when they feel surly do not increase their fee-for-service or capitation revenue but find their reward, not only in heaven, but in the enhanced value of the practice they eventually can sell or bequeath to a junior partner. The continuing vitality of solo practice and small partnerships, now so rare in other industries, provide more evidence, if any is needed, that physician behavior responds strongly to financial incentives.

If the limitations of fee-for-service and capitated payment methods drive compensation systems toward blends of retrospective and prospective payment, the limitations of employment and self-employment—of large medical groups and solo practice—drive physician organization toward blends and curious new forms. Independent practice associations, to choose an obvious example, permit member physicians to retain ownership and control of their individual practices but still pursue economies of scale and coordination by centralizing medical management and other managed care functions (Shenkin 1995; Grumbach, Coffman, Vranizan, et al. 1998). IPAs also offer a payment blend distinct from those emphasized here, by allowing a group of doctors to accept prospective capitation payment for the full range of primary and specialty services, while paying each individual physician on a fee-for-service, capitated, or blended method for only those services he or she provides personally. The IPA's role as a payment intermediary is the bane of health service researchers who query health plans as to how they pay physicians, since the health

plan can pay global capitation while the doctor receives fee-for-service. We currently observe widespread experimentation in the form of physician organizations, especially single-specialty networks and carve-outs, that mimic some aspects of IPAs but avoid the multispecialty politics and capitated risk-bearing that have caused so many problems.

Implications for Health Services Research

Blended Payment Methods

Physician behavior is complex, difficult to monitor, and often difficult to understand. Simple payment mechanisms should not be expected. Even a cursory discussion of imperfect information, risk aversion, multiple tasks, and team production highlights the liabilities of using fee-for-service and capitation to induce and reward physicians for doing what we want them to do. As is the case in other occupations and industries, the imperfections of purely retrospective or prospective payment mechanisms can be attenuated through mixing and matching, the creation of blends such as capitation with fee-for-service carve-outs, fee-for-service within a capitated department budget, or case rates for episodes of care. The principles of blended payment mechanisms are to be observed not merely in the manner in which individual physicians are paid but also in interrelationships among payment mechanisms for primary and specialty physicians and in the relationships between insurers, multispecialty physician organizations, single-specialty carve-outs, and the individual clinician. Even the most sophisticated price and payment mechanisms, however, falter when faced with the enormity of their incentive responsibilities, and hence are supported by nonprice mechanisms such as credentialing, selective contracting, protocol formulation, practice profiling, norms, and organizational cultures. One cannot understand the origin, function, and performance of particular payment mechanisms without understanding their interdependence with nonprice dimensions of the health care system. Indeed, payment incentives that might appear either excessively or insufficiently effective, faced with the pertinacity of human nature, may perform quite well when combined judiciously with nonprice mechanisms that offset their excesses and bolster their weaknesses.

Payment and Organization

Too often, theoretical discussions and empirical analyses of payment mechanisms fail to consider the organizational structures of health care and the position of physicians within them. Yet the economic relationship of the individual to the organization constitutes in its own right a powerful incentive mechanism. Salaried employment and sole proprietorship constitute two ends of a spectrum of relationships that includes partnerships, producer cooperatives, stock options, and numerous other arrangements that tie pay to performance in some manner. The traditional structure of solo practice and fee-for-service payment, to cite an obvious example, embodies a nonlinear incentive mechanism in which the physician is rewarded on a piece-rate basis for a defined set of procedures (those falling within the CPT index) and on a residual claimant basis for all others (as owner of the tangible and intangible assets of the practice). The paucity of salaried payment mechanisms for physician services, often bemoaned by those seeking some middle path between fee-for-service and capitation, must be understood in light of the organizational structures that employment and salary presuppose. A comprehensive theory of physician payment, therefore, would lead into an analysis of the ownership and governance liabilities of physician organization that long have relegated group practice to the margins of the profession (Robinson 2001a).

Methodology

Physician payment mechanisms are complex, and are embedded in equally complex organizational structures. The study of physician payment, an emerging cottage industry in its own right, cannot be viewed as an easy endeavor. Most obviously, this domain requires a judicious mix of empirical methodologies, including case studies, population surveys, and the creative analysis of secondary data sources. Case studies are valuable in providing the fine-grained understanding of payment blends, interdependence between price and nonprice mechanisms, and the role of ownership and organization that underlie well-designed quantitative surveys. We cannot be content with simple surveys that ask HMOs whether they pay physicians fee-for-service, capitation, or salary without probing for hybrid forms, contractual intermediaries, and other dimensions of the relationship. Attention should be accorded to viability as a measure of

performance, in addition to side-by-side comparisons of different mechanisms or organizational structures. If two payment mechanisms differ significantly in their ability to stimulate desired forms of behavior, the more effective form will drive the less effective one from the market. If two different mechanisms exist simultaneously in the same market, our initial hypothesis would be that they are comparably effective in achieving their goals, though perhaps through different combinations of price and nonprice mechanisms. Survival as a measure of efficiency is limited, of course, due to the confounding effects of political regulation, monopoly power, and chance events on organizational destinies.

Case studies and quantitative surveys complement each other nicely, but purely inductive efforts to understand physician payment mechanisms are doomed to failure, at best, and to misleading inference, at worst. The matter is too complex for even the most thoughtfully designed, efficiently executed, and generously funded set of empirical analyses. Here, as elsewhere in health services research, there needs to be greater attention paid to the basic theory of payment incentives, drawn from mainstream economics and the other social sciences, and to empirical regularities derived from payment mechanisms in other occupations and industries. The greatest single barrier to the understanding and improvement of physician payment mechanisms is the false truism that health care is different (Robinson 2001b).

Implications for Health Policy

Public policy plays a major role in the design of physician payment mechanisms, both directly through the Medicare and Medicaid programs and indirectly through the regulations that influence what can be done and by whom, what can be paid and by whom, and what can be owned and by whom. The policy implications of this discussion flow directly from the theoretical and methodological implications, influencing our general view of market experimentation, Medicare's administered pricing system, and the statutory framework within which both private and public payment mechanisms are bound.

The first implication of the analysis is perhaps the most important, since it frames those that follow. The principal-agent literature argues that blended methods outperform pure fee-for-service and pure capitation, given the salience of imperfect information, risk aversion,

multiple tasks, and team production efficiencies. Economic theory argues that market competition will drive out less effective forms of contract and organization through some combination of Darwinian selection and adaptive imitation. Lo and behold, we observe that the stimulus of competition in health care has generated experimentation in methods of physician payment, as well as in methods of contracting and organization, and that blended methods are coming to the fore. This is not to argue that mistakes are not made, that waste is not to be found, and that fraud and abuse do not take their cut of the proceeds. But the evidence of our senses, here as elsewhere, is consistent with the notion that markets stimulate innovation and that those innovations take hold that best navigate the turbulent conflicts out of which they emerge.

The focus of this paper on payment mechanisms in the private sector in no way implies disrespect for the important payment innovations developed in the public sector. The Resource-Based Relative Value Scale, for example, has proved its value for the Medicare system and through its widespread adoption by the private sector, including payers who use it to shadow-price their capitation rates. Other public payment mechanisms have been less successful in achieving their goals, and consequently have been less widely adopted by the private sector. The public and the private sectors should monitor each other and adopt what seem to be the best new ideas and methods, whatever their provenance. What is to be avoided is a one-sided prejudice in favor of uniformity and stability at the cost of forgone diversity and experimentation.

Physician payment mechanisms are inevitably subject to more public monitoring than compensation systems in other occupations, since we all care more about our doctor's immediate motivation than we do about our accountant's or plumber's. The manner in which physicians can be paid, both directly in fees and indirectly through ownership interests in ancillary facilities, is subject to a dense web of laws, regulations, and legal precedents. The polity holds an obligation to establish a framework for fair and informed contracting in physician services, as in other economic activities. The tendency to overregulate must be recognized, however. The complexity of clinical services, combined with the importance that we all ascribe to what happens between physicians and patients, is conducive to the most egregious manifestations of what legal theorists refer to as the inhospitality tradition. That which cannot be understood without effort is deemed *ipso facto* to be designed for fraud, monopolization, or some other antisocial purpose. Regulation is not always created with

the public interest at heart, as it is heavily influenced by the campaign contributions and lobbying efforts of the special interests affected. Even when conducted in the public spirit, however, regulation invariably runs the risk of locking in the status quo, taxing initiative, and discouraging innovation. The contemporary moment in health policy is nothing short of a Dionysian rhapsody of regulation, the inhospitality tradition gone riot, the formal and final enshrinement of the doctrine that everything not mandatory is prohibited. The complexity of physician behavior, the emergence of payment methods that blend fee-for-service and capitation, the interdependence of price mechanisms with nonprice mechanisms, the salience of organization as a support for compensation systems, and the remarkable variety and continual change in all arenas suggest that public policymakers should adopt a stance of intellectual humility and a tone of cautious optimism. In physician payment, as in most other aspects of life, matters are never as good as we might hope but never as bad as we might fear.

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