Chapter 4

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INTRODUCTION

Perhaps even more important than how Diagnosis Related Group (DRG) payment affects the use of presently available medical technologies is how DRG payment will affect technological change in medicine—the adoption of new technologies and discarding of old ones. As a society, we value technological progress, the "introduction to practice of new and more useful ways of serving human purposes" (73). Technological change should act as a filtering process, continually winnowing out the less useful in favor of more useful technologies. To what extent can DRG payment be expected to improve or hinder this process? Since DRG payment will influence hospitals' incentives to adopt new medical technologies, it may therefore ultimately alter the rate and direction of technological change in medicine. This chapter will examine the implications of DRG payment for technological change.

Conversely, technological change occurring due to other forces will inevitably require adjustments in a DRG payment system itself, if the system is to continue to function effectively. These adjustments range from changes in the relative rates of payment across DRGs to changes in the definitions of DRGs themselves. Thus, a DRG payment system must encompass procedures for timely adjustment to new knowledge and technological conditions as they arise. This chapter will explore the reasons for this conclusion and will also examine the kinds of information and procedures that will be needed to monitor the performance of a DRG payment system over time.

EVIDENCE OF EFFECT ON TECHNOLOGICAL CHANGE

Empirical evidence on the effect of DRG payment on the adoption of new technologies is unavailable, but studies of other kinds of prospective payment systems suggest that hospitals can and do respond to changes in financial incentives in their decisions regarding the adoption of new technologies. Three studies of the impact of hospital prospective payment programs on the adoption of new services and technologies provide evidence of the response of hospitals to changes in financial incentives.

Joskow (41) analyzed the effect of ratesetting programs on the availability of computed tomography (CT) scanning in hospitals. The number of CT scanners in a State in 1980 was found to be negatively related to the number of years that ratesetting had been in effect in the State. Hospital ratesetting also led to a shift in the location of CT scanners to physicians' offices.

Cromwell and Kanak (11) recently analyzed the impact of 15 State ratesetting programs on the availability of 13 different services in the hospital between **1969** and **1978.** Table **2** summarizes the results. New York had the most consistently negative effects on the availability of all types of services. New Jersey's DRG ratesetting program also appeared to generally reduce the availability of complex services, with the exception of electroencephalogram (EEG) services. Other States' programs showed no consistent impact on service adoption. It is interesting to note that the service upon which ratesetting had the highest and most widespread negative effect is social work, a labor-intensive, not equipment-intensive, hospital service.

In still another study of hospital payment and technology diffusion, Wagner, et al. **(95),** investigated the impact of prospective payment in

Table 2.—Ratesetting Regression Coefficients, Selected Facilities and Services

State program	Complex services						Quality enhancing			Community services			
	Radio-therapy	ICU	Open heart	EEG	Radio-isotopes	Burn care	Physical therapy	Premature nursery	Pathology lab	Social work	Outpatient department	Emergency department	Psychiatric emergency
Arizona:													
Voluntary, 1974-78	0.10[a]	—	—	-0.06[b]	—	—	—	-0.06[c]	—	-0.05[c]	—	—	—
Connecticut:													
Voluntary, 1969-72	—	—	—	—	—	—			—	—	—	—	—
Mandatory, 1975-78	—	—	—	—	—	—	-0.11[a]	—	—	—	—	—	—
Kentucky:													
Voluntary, 1975-78	—	—	—	-0.04[c]	—	—	0.05[b]	—	—	—	—	0.03[c]	-0.04[b]
Maryland:													
Mandatory, 1975-78	—	-0.12[c]	—	-0.15[a]	—	—	—	0.17[a]	—	-0.13[b]	—	—	—
Mandatory, 1976-78	—	—	—	—	—	—	—	-0.13[a]	—	-0.10[a]	—		
Massachusetts:													
Mandatory, 1975-78	—	-0.07[b]			—	—	—	—	—	-0.06[c]	—	—	—
Mandatory, 1976-78			—	—	—	—	—	—	—	—	—	—	—
Minnesota:													
Voluntary			—	-0.70[a]	—	—	-0.04[c]	—	-0.04[c]	-0.08[a]	—	—	—
Mandatory, 1978	—	-0.08[b]			—	—	—	—	—	-0.07[c]	—	—	—
Mandatory, Rev. 78			—	—	—	—	—	—	—	-0.09[c]	—	—	—
Nebraska:													
Voluntary, 1973-78			-0.06[b]	—	—	0.07[a]	—	0.14[a]	—	—	—	—	—
New Jersey:													
Mandatory, 1975-78	—	-0.08[a]	-0.10[a]	0.04[c]	—	-0.03[b]	0.05[c]	0.08[a]			-0.06[b]	—	—
New York:													
Mandatory, 1971-78			-0.04[a]	—	-0.04[b]	—			—	—	—	0.03[b]	—
Mandatory, 1976-78	-0.06[a]	-0.03[c]	-0.03[a]	-0.04[a]	-0.02[c]	-0.02[a]	—	0.05[a]	—	0.05[a]	—	-0.03[a]	—
Rhode Island:													
Mandatory, 1973-78					-0.14[c]	—	—	—	—	—	—	—	—
Western Pennsylvania:													
Voluntary, 1971-78	-0.14[a]	-0.08[a]	—	—	0.06[c]	-0.02[b]	—	-0.08[a]	—	—	—	—	0.06[b]
Washington:													
Mandatory, 1976-78					—	0.02[b]	—	—		—	—	—	—
Mandatory, 1978	—	—	—	—	—	0.02[b]	—	—	—	-0.05[c]	—	—	—
Wisconsin:													
Mandatory, 1973-78	—	—	—	—	-0.05[a]	—	0.08[a]	-0.09[a]	—	0.06[a]	—		

[a]Significant at the 95-percent confidence level.
[b]Significant at the 90-percent confidence level.
[c]Significant at the 85-percent confidence level.

SOURCE: J. Cromwell and J. Kanak, "The Effects of Reimbursement Programs on Hospital Adoption and Service Sharing," *Health Care Review* 4(2):67, December 1982.

three States (New York, Maryland, * and Indiana) on the adoption of five new pieces of capital equipment: electronic fetal monitoring, gastroendoscopy, volumetric infusion pumps, automated bacterial susceptibility testing, and computerized energy management systems. The first three technologies probably raise the daily cost of care, although their effect on the average cost per case is unknown. The latter two are investments in cost-saving equipment. The New York ratesetting system was found consistently to lead to adoption of fewer units of the cost-raising technologies and to increase the probability of large hospitals' adopting the cost-saving equipment. However, the prospective payment programs in Maryland and Indiana showed no such consistent effects on hospitals' adoption behavior.

Together these studies imply that prospective payment does affect the adoption of new technology in predictable ways, but that much depends on the strength and design of the program. New York's system, the oldest and most restrictive ratesetting program, has clearly altered the extent of availability of new technology. Since its inception in 1970, New York's system has put a heavy emphasis on financial risk to the hospital while at the same time offering little financial reward. Other systems may be too new, too small, or too weak to show longrun consequences.

***The test of the Maryland system did not discriminate between hospitals paid by the case and those on the State's conventional ratesetting system.**

CLASSIFICATION OF NEW HOSPITAL TECHNOLOGIES

DRG payment incentives do not affect the introduction of new technologies uniformly. This is partly because of variation in the cost implications of medical technologies. But it is also because medical technologies may be adopted (or not adopted) according to their clinical benefits (or risks). These clinical implications naturally vary widely. However, for the purpose of analysis, it is necessary to classify new hospital technologies according to criteria that highlight the likely effect of DRG payment on their diffusion into the practice of medicine. The most basic distinction is due to the per-case nature of DRG payment. Thus, hospital medical technologies can be viewed as those whose adoption decreases the hospital's total cost per case—cost-saving technology-and those whose adoption increases the hospital's total cost per case—cost-raising technology.

Cost-saving technology would include a new technology that provides a particular service less expensively, or one that reduces the required number of services or length of stay (LOS) sufficiently to justify the investment. A cost-saving technology in one hospital may be cost-raising in another. The expected volume of use is often an important factor in determining whether a technology will be cost-saving. For example, capital equipment that replaces other procedures may be cost-saving in a large hospital but cost-raising in a small one. Had CT head scanning been introduced in an era of DRG payment, it may well have been justified on the basis of per-case cost reductions in hospitals with large neurology or trauma services (40,84). Yet its introduction into hospitals with lower neurological case loads would probably have required justification on other grounds, such as improvements in patient access or outcome.

Many new procedures and therapies introduced in the past have raised the cost of hospital stays, even in high-volume institutions. Presumably, these cost-raising technologies improve patients' health outcomes or reduce patients' medical care expenditures outside of the hospital. Of course, some new cost-raising technologies have neither improved patient outcomes nor saved systemwide medical care costs. Gastric freezing, a technology of the mid-1960's is a good example (21). Some have claimed that intermittent positive pressure breathing (IPPB), a respiratory therapy technology, provides another example (74).

Hospital technologies can be further classified according to their effects on capital and operating costs per case. Table 3 describes four kinds of technological innovation categorized by their ex-

Table 3.—Four Types of Technological Innovations and Effects on Capital Cost, Operating Cost, and Total Cost

Type of innovation	Direction of effect on: Capital cost per case	Operating cost per case	Total cost per case
1. Cost-raising, quality-enhancing new technology	+	+	+
II. Operating cost-saving innovations			
A.	+	–	+
B.	+	–	–
III. Capital cost-saving innovations			
A.	-	+	+
B.	-	+	–
IV. Service/procedure disadoption	-		–

SOURCE: Office of Technology Assessment.

pected effects on capital, operating, and total costs per case. Type technology, which raises all components of hospital cost per case, represents the classic cost-raising, quality-enhancing technology that would be introduced for its presumed patient benefits. Intensive care monitoring is an example of such a technology. Type II represents a broad range of capital investments that would save operating costs during the patient's stay. Automation technologies fall into this category, but so, too, do new diagnostic or therapeutic procedures that reduce LOS or intensity of care. These "operating cost-saving" technologies may or may not lower the total per-case cost of care, depending on the relationship between capital and operating costs. Type III technologies involve new, simpler approaches to care, in which expendable labor, materials, or supplies are substituted for capital equipment. The abandonment of a capital cost-saving technology falls into this category, as does a new labor-intensive test that replaces less effective but automated laboratory procedures. Finally, Type IVrepresents the disadoption of a service or procedure resulting from new knowledge of its lack of clinical efficacy or safety. The rapid decline in recent years in the use of IPPB therapy following publication of evidence on its lack of efficacy in many clinical settings is a good example.

GENERAL INCENTIVES FOR TECHNOLOGICAL CHANGE IN DRG PAYMENT

Although there is no empirical evidence, it is possible to describe the incentives regarding technological change under DRG payment. Many observers have pointed out that per-case payment systems, in which future levels of payment are largely independent of the hospital's own historical costs, create incentives for hospitals to adopt cost-saving technologies. Yet because technologies are neither cost-saving nor cost-raising independent of the context in which they are used, all hospitals cannot be expected to adopt the same technologies. The introduction of new capital-intensive cost-saving technologies in a DRG payment environment is likely to speed up the process of specialization as small hospitals become unable to reap the cost-saving benefits of some investments. Some technologies that depend on high volume to be cost-saving could be provided to smaller hospitals on a contract basis by large hospitals or independent laboratories. The feasibility of such arrangements would vary with the specific uses of a technology and the geographical and competitive environment in which the hospitals operate.

The introduction of new "cost-raising" technologies is discouraged, but not eliminated, under DRG payment compared to cost-based payment.

Under cost-based payment, the additional hospital costs of new technologies are fully covered; hospitals therefore have no financial incentives not to adopt such innovations. Under DRG payment, the adoption of new cost-raising technology is not met with an automatic increase in revenues to cover the additional cost. New technology will have to compete with alternative uses of funds, such as employee wage and benefit increases, additional nursing staff, etc. New technology may beat an additional disadvantage relative to other uses of funds because of the relative uncertainty about its benefits in the early stages of diffusion **(72).** The implications are obvious: with limited resources, hospitals will need to assess new technologies more closely and ration resources more carefully.

Nevertheless, the introduction of promising new technologies, even those that are cost-raising to the hospital, will be attractive to hospitals as they compete for physician loyalties and, ultimately, the admissions they represent. For example, despite its high capital and operating cost, nuclear magnetic resonance imaging, a new medical imaging technology still in the investigational phase, may be highly desirable to hospitals that seek to protect their admissions base from encroachment by other hospitals. The importance of this incentive as a constraining force to the previous incentive is unknown. Thus, though DRG payment, in general, does not imply that technological change will aproach a standstill, its directions are likely to be altered, and the adoption of technologies that are cost-raising to the hospitals is likely to decline by an unknown quantity.

KEY FEATURES OF PROGRAM DESIGN THAT AFFECT TECHNOLOGICAL CHANGE

As with its impact on technology use, the impact of DRG payment on technological change will be influenced by the key features of program design. In particular, the methods of providing rewards for cost reductions, treating capital costs, and updating DRG prices have important implications for technological change.

Risk and Reward

The ability of hospitals to generate and keep surplus sufficient to fund investments in new technology depends to a large extent on the average payment level of the payment system as a whole. A DRG payment system can be either restrictive or generous. A restrictive payment policy will encourage rapid adoption of cost-saving technologies but will discourage investments in cost-raising technologies. A more generous payment level may reduce the pressure for the adoption of cost-saving technology but will also provide surplus for cost-raising investments.

Treatment of Capital Costs

The exclusion of capital costs in the DRG payment rates will change hospitals' incentives to introduce certain kinds of new technologies. * Table 4 describes how the incentives provided by DRG payment are influenced by the capital payment mechanism. Capital payment methods do not alter the direction of such incentives as long as the effect of a new technology on total cost per case is in the same direction as its effect on operating costs. For example, DRG payment provides a disincentive to adopt most cost-raising, quality-enhancing (Type I) technologies regardless of the way in which capital is handled. Capital cost pass-throughs weaken the disincentive not to adopt this kind of technology, but they do not

***Exclusion of costs from DRG payment rates is referred to as treating those costs as "pass-throughs." Under some DRG payment systems, pass-throughs have been subjected to different kinds of controls. (See app. C for a description of New Jersey's and Maryland's systems.)**

Table 4.—impact of Technological Innovation on Per-Case Costs

Type of innovation	Direction of effect on: Capital cost per case	Operating cost per case	Total cost With per case	Incentives for adoption: capital in rate	without capital in rate
1. Cost-raising, quality-enhancing new technology	+	+	+	1	1
II. Operating cost-saving innovations					
A	+	–	+	1	!
B	+	–	–	f	f
III. Capital cost-saving innovations					
A	–	+	+	1	1
B	–	+	–	I	1
IV. Service/procedure disadoption	–	–		t	1

SOURCE: Office of Technology Assessment.

remove it. New technologies with high capital costs, but only small increases in operating costs, would be affected less by DRG payment with a capital cost pass-through than by DRG payment with capital built into the rate. Similarly, capital disinvestments (Type IV), occasioned perhaps by the introduction of a simple procedure to replace a capital-intensive one or simply by the abandonment of an ineffective technology, are encouraged by DRG payment regardless of the way in which capital costs are treated.

Operating cost-saving (Type II) and capital cost-saving (Type III) technologies can lead to situations where the incentives for hospitals to adopt may actually be reversed by the policy regarding payment of capital. Of particular concern is the incentive under a pass-through to adopt expensive capital equipment that reduces operating costs but raises total cost per case. Like regulated utilities, where allowed profits are computed as a percentage of the amount of equity capital, hospitals can be expected over time to become too capital-intensive (3).

The Social Security Amendments of 1983 (Public Law 98-21) provide for capital to be treated as a pass-through under the new DRG payment system. Capital technologies will continue to be paid retrospectively on the basis of reasonable costs. However, the inadequacy of this method was recognized by Congress in the new law. The law requires the Department of Health and Human Services (DHHS) to submit a report to Congress by October 20, 1984 on payment for hospital capital. The intention of the law is that at the end of 3 years, Congress will have legislated a new capital policy that will deviate from present cost-based reimbursement. Although the issues in capital formation policy are complex and beyond the scope of this technical memorandum, any policy that eliminates the pass-through will have desirable effects on the consistency of hospital technology acquisition decisions.

Methods of Updating DRG Prices and Categories

The longrun viability of any DRG payment system depends on its ability to both adapt to and encourage appropriate technological change in medicine. A payment system that is rigid in the face of medical progress will become unacceptable to providers, patients, and the public. Consequently, the methods and procedures used to adjust the average payment level, relative DRG rates, and the DRG categories themselves are critical to the longrun survival of the system.

The primary objective of a DRG price adjustment process is to maintain equality across DRGs in the ratios of price to the cost of efficient care. This objective implies that as new cost-saving technology becomes available for use in certain DRGs, the relative prices of these DRGs should be adjusted downward to reflect the new efficiencies. Alternatively, the development of new cost-raising technologies that improve patient outcomes enough to justify their use should be met with increases in the prices of relevant DRGs. Adjusting relative prices to reflect technological change as it occurs provides appropriate incentives for efficiency and specialization in the delivery of hospital care.

But to simply adjust prices in reaction to technological change is insufficient. A second objective of the price adjustment process is to encourage hospitals to adopt ***appropriate*** new technology. The previous sections concluded that while DRG payment encourages the adoption of cost-saving technology, it reduces hospitals' incentives to adopt new cost-raising technologies. Depending on the general restrictiveness of the payment system, the effects may be to discourage diffusion and perhaps even the development of costly but effective new hospital technologies. The DRG price adjustment process can be used to counteract this incentive for deserving technologies.

There are two general methods of DRG price adjustment: conditional adjustments and unconditional adjustments. Conditional DRG rate adjustments are those granted only to hospitals actually adopting a new technology; unconditional rate adjustments are those that apply to all hospitals (or to a class of hospitals) whether or not they use the new technology. There are three possible unconditional adjustment processes:

- ***Periodic empirical reestimation of relative DRG costs.*** —This method is statistical and reactive in nature; as technological change alters the costs of serving specific DRGs, the calculated rates change. The process is also gradual, because estimated relative weights based on average costs across both adopters and nonadopters of a new technology would only partially reflect the effects of the new technology on the efficient cost of accepted care. Only in the final stages of diffusion when the new technology is uniformly applied across all hospitals would the estimated relative costs reflect the technology's full effect.
- ***Application of a technology factor.*** —This method employs an annual percentage increase in the average rate of payment for all DRGs to provide funds for the adoption of cost-raising technology. * For example, the new Medicare law requires that the annual increase in the average payment level reflect technological change as well as general inflation, but the amount of increase is not statutorily specified. Inclusion of such a factor in the annual rate increase gives hospitals funds to use for any purpose, including technology adoption.
- ***Central policy decision to change relative DRG rates.*** —-A designated State or national agency can make purposeful adjustments in relative DRG rates to reflect a change in technological conditions. The new Medicare law specifies that the Prospective Payment Assessment Commission make recommendations regarding periodic adjustments in relative DRG rates to reflect changing technology. This Commission could recommend an increase in the rate paid for a particular DRG relative to other DRGs as a means of funding the acquisition of a cost-raising technology. Of course, hospitals treating patients in the DRG with the increased rate would be free to use the additional revenue for any purpose.

Conditional adjustments in DRG prices can be accomplished by two general mechanisms:

- ***Provider-initiated appeal.*** —Individual hospitals contemplating adopting a new technology can request an adjustment of rates in specific DRGs to fund its acquisition. Presumably, hospitals would not request reductions in rates due to cost-saving innovations. Instead, this approach is potentially useful for case-by-case exceptions to DRG rates to pay for new cost-raising technology. The new Medicare law specifically prohibits hospitals from appealing DRG rates, but appeals are allowed for very high cost "outlier" patients on a case-by-case basis. The State of New Jersey has a DRG appeals mechanism that is intended to bring to the surface new technologies in need of extra payment. To qualify as a DRG appeal, the new technology must be shown to affect one or more DRGs accounting for at least 10 percent of the hospital's costs or admissions and to affect one or more hospitals other than the applicant (63).
- ***Creation of new DRGs. —New*** DRGs, differentiated from preexisting ones by the use of a specific technology, can be created as

***In theory, a negative technology factor could be used to reduce funds in anticipation of cost reductions, but it has not been applied in this manner in any State system.**

a way of paying a hospital only if it actually adopts and uses the technology. The new DRG would be assigned a price reflecting the higher or lower resource costs associated with the use of the new technology. For example, liver transplantation might become its own DRG, although the Medicare program does not yet pay for such procedures. When and if the new procedure is considered ready for payment, a DRG price will be assigned that can be obtained by any hospital performing the procedure. Those hospitals not performing transplant operations will not receive the additional revenue, because they will have no patients in that DRG.

The first objective of DRG rate adjustment—the maintenance of equal ratios of price to the cost of efficient care among DRGs—depends largely on unconditional rate adjustments. Although periodic reestimation of DRG costs represents a gradual adjustment to new technology, it is a reasonable method for adapting to cost-saving technological imovation. Because cost reductions would be reflected only gradually in relative rates, hospitals adopting such innovations would reap a positive, albeit declining, return on their investments over a long period. Hospitals lagging in adoption of cost-saving innovation would gradually be subjected to greater penalties. Thus, the reestimation process is a gentle adjustment method which nevertheless embodies strong incentives for hospital efficiency.

Central policy decisions to force more rapid adjustment of payment rates to new cost-saving technologies are also feasible and may be useful from time to time. Yet, it maybe difficult early in the availability of a new technology to predict how large a saving to expect and how such savings are likely to vary among hospitals. Since the incentives to adopt new cost-saving technology are already strong in DRG payment, radical reductions in specific DRG rates are likely to be more disruptive than useful.

The second objective of a DRG adjustment process-encouraging the adoption of appropriate technologies, particularly those that are cost-raising to the hospital-may use either conditional or unconditional adjustment methods. But no one method alone is completely satisfactory for this purpose. Periodic reestimation of DRG costs is not likely to be sufficient to induce hospitals to adopt desirable cost-increasing technologies, especially very expensive ones. Early adopters would bear the full extra costs of such a new technology, but the updated weights based on averaging costs across both adopters and nonadopters would not reflect the full increase in per-case costs. Hence, the initial stages of the diffusion process would be underfinanced.

Inclusion of a general technology factor in the annual average rate of increase does provide funds for the adoption of new cost-raising technology. However, this kind of across-the-board increase rewards innovative and noninnovative hospitals alike and may even cushion some hospitals against the need to become more efficient, because they are free to spend the additional revenue however they choose. Consequently, a technology factor is an inefficient approach to encouraging the adoption of cost-raising technology, since it is likely to fund less of such innovation than the cost of the approach to third-party payem.

The same criticism can be made of central policy decisions to increase the relative rates of certain DRGs. The hospital would be free to use the extra payment from an adjusted DRG price for any purpose. Thus, centrally mandated rate adjustments would give equal reward to adopters and nonadopters.

Yet, conditional adjustment mechanisms, such as creation of new DRGs or individual provider appeals, have their own shortcomings. Creation of new DRGs may appear on the surface to be an ideal approach, but it has serious deficiencies as the major tool. The prospect of DRG inflation—the gradual increase in the number of categories-has severe implications for management of data and information. If the experience with medical procedure nomenclature is any guide, the rate of increase in the number of categories can be expected to be high (55). The first revision in DRG nomenclature increased the number of categories by 22 percent. The additional data required on hospitals' claims to make fine distinctions in DRG assignments would certainly add an administrative burden on hospitals and payers.

Second, and more important, over time DRG payment would come to look more and more like fee-for-service medicine, where the amount of payment is inextricably linked to the procedures performed. Financial incentives to perform profitable combinations of procedures could develop. In addition, substitution of a new cost-saving procedure for a more expensive one would be discouraged if it were to bump a patient out of the higher priced category into a lower priced one. Thus, the uncontrolled expansion of categories can create a more rigid, less cost-effective health care delivery system.

Reliance on case-by-case hospital appeals of DRG rates is likely to be administratively costly and cumbersome compared to other methods. Unfortunately, there is little experience to date with New Jersey's DRG appeals process, and even if there were, it is unclear whether the experience of a single State is germane to operation of a national appeals process. Nevertheless, the New Jersey appeals process bears watching as a potential model for adoption in a more general DRG payment system.

It is worth noting that any approach to updating relative DRGs to account for new cost-raising technology requires information on which to base conclusions about the readiness of a new medical technology for payment. In effect, technology assessments are needed to support the decision process. For example, should the relative rates of those DRGs using hyperalimentation be adjusted to reflect the additional costs of this technology? Such questions would of necessity transcend case-by-case appeals processes. A mechanism and adequate resources for conducting integrated and comprehensive assessments of such questions ***are*** important for supporting the DRG adjustment process. The Prospective Payment Assessment Commission established by the Medicare law is empowered to conduct or fund such assessments, but other research resources may also be usefully employed in providing information to support such critical decisions.

COVERAGE POLICY, DRG PAYMENT, AND TECHNOLOGICAL CHANGE

Since its inception, the Medicare law has mandated that a specific technology or service must be a "covered" benefit, i.e., a benefit eligible for payment, in order for providers to be reimbursed for its provision. Although Medicare specifies broad categories of covered benefits, specific technologies, particularly new ones, require individual coverage determinations. Such coverage decisions are governed by section **1862** of the Social Security Act, which excludes payment for items and services that are "not reasonable and necessary" for diagnosis, treatment, or improved services. "Reasonable and necessary" lacks precise definition: the Medicare program applies the terms to technologies that are generally accepted by the medical community as being safe and effective and are perceived to have moved beyond experimental status to clinical application.

These coverage requirements have acted as a barrier to adopting new, untested technologies and, in a passive way, have discouraged the abandonment of outmoded technologies. Although the extent to which coverage policy has been an effective "technology watchdog" varies among particular technologies, it is generally accepted as ***in***fluencing the diffusion of technologies. Under the new Medicare law, the provisions of section **1862** remain. Since DRG payment will also affect the rate and direction of technological change, the relation of the two, coverage policy and DRG payment, has implications for medical technology in the Medicare program.

At this time, the interactions between Medicare coverage policy and DRG payment as mandated in Public Law 98-21 are limited to the hospital portion of inpatient services. As noted previously, outpatient services and physician services-provided in or out of the hospital—are not included in the DRG system. Instead, they are paid for as before the law's enactment: outpatient services are

reimbursed on a reasonable cost basis, and physician services are reimbursed on a reasonable charge basis.

The ability of coverage decisions to assist in appropriate technological change depends in part on the identification of new technologies and new uses of established technologies. If a technology that is part of the hospital portion of inpatient services (now paid by DRG payment) comes to the Medicare program's attention as "new," a determination of its safety and efficacy will still be required. Although DRGs are generally constructed according to diagnosis (and not treatment), there are several ways to identify new technologies under the newly mandated DRG payment system. A few still-to-be-covered technologies, the most obvious being heart transplant, are specific DRGs. Program administrators also will have the potential to identify established surgical procedures in reviewing claims for DRG payment, but will not be able to identify new surgical procedures by claims review.

Another opportunity for identifying new technologies will occur when hospitals appeal their payment levels for "outlier" cases. Many of these cases will be high-cost outliers precisely because new and costly technologies will have been employed. If a new procedure is not covered, denial of an outlier claim is a likely prospect.

Finally, new technologies and new uses of established technologies will be recognized during the process of adjusting DRG rates. Indeed, updating DRG prices appears to offer the most significant opportunity of identifying such technologies for coverage purposes. The decision to adjust DRG rates can therefore be considered a quasi-coverage decision itself.

Under current Medicare coverage policy, once a new technology is identified and brought to the attention of program administrators, the Health Care Financing Administration (HCFA) arranges for the Public Health Service to conduct an assessment to ascertain the safety and efficacy of the technology. HCFA subsequently determines the coverage status of the technology based, in part, on the results of the technology assessment.

For the DRG payment system, changes in DRG relative weights or prices will be made, in part, to reflect technological change. Because this process* must include identification of new technologies, it is reasonable that some of the techniques, including technology assessments, used to adjust DRG rates will be similar to those used for supporting coverage decisions. For example, the Prospective Payment Assessment Commission has been given broad powers to assess medical technology and the appropriateness of medical practice patterns in performing this task. It is this Commission that must make recommendations to the Secretary of DHHS concerning the appropriate payment rate for hospital services according to its findings.

Thus, both the coverage process and the process of adjusting DRG rates share a similar "approval for payment" function. They differ in that a coverage determination focuses on specific technologies while adjusting DRG payment rates focuses on the larger entity of a diagnostic group, which includes particular technologies. Moreover, the DRG rate adjustment process must include issues of cost as an integral issue, while the coverage process at present does not consider cost issues. Nonetheless, the technology assessments performed for both processes no doubt will be similar. The potential for duplication is not to be ignored.

Whether technologies will be subject to a double review of safety and efficacy for payment purposes will depend on the approach chosen to update DRG prices. Irrespective of approach, it is reasonable to assume that hospitals' adoption of cost-raising technologies will be made evident to HCFA for DRG payment and for coverage policy. However, some approaches to updating DRG rates, i.e., provider appeals, would not surface cost-saving technologies. Because specific technologies will not be identified on the DRG hospital claims form, the adoption by a hospital of a new, uncovered, cost-saving technology would not become known to HCFA through hospital claims

***As noted in the previous section, the specific mechanisms of the process have not yet been determined.**

review. However, as in the past, HCFA will rely on physician claims and other sources to provide information to stimulate the initiation of a technology assessment solely for coverage purposes.

Many new technologies, especially those that are cost-raising, could conceivably be faced with the prospect of a double barrier to introduction—an assessment for coverage purposes and an assessment for DRG rate adjustment. Although the evaluations may differ for the two purposes, the processes appear to be sufficiently similar to warrant coordinated Government effort. The unintended confluence of the two administrative processes needs to be examined in order to conserve Federal resources and to promote the diffusion of appropriate technologies.