Commentaries

Controlling the Cost of Dental Care

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Abstract: Methods for controlling dental care expenditures are taking on greater importance with the rapid increase in prepaid dental plans. The use of regulatory systems to monitor provider performance are necessary to prevent gross over-utilization but are unlikely to result in net savings of more than five per cent of total gross premiums. Theoretically, prepaid group dental practice (PGDP) may reduce expenditures by changing the mix of services patients receive. The modest estimated savings and the small number of PGDPs presently in operation limit the importance of this alternative for the next five to ten years. If substantial reductions in dental expenditures are to be obtained, it will be necessary to limit dental insurance plans to cover only those services which have demonstrated cost-effectiveness in improving health for the majority of people. The concept that richer benefit plans may have small marginal effects on improving oral health may not be easy for the public to accept but, until they do, expenditures for dental care will be difficult to control. (*Am J Public Health* 69:699-703, 1979.)

Now that most employee groups have hospital/surgical coverage, dental benefits are becoming a major negotiating issue. In the last five years, the number of Americans with dental insurance as a benefit of employment has increased from 7 million to 48 million.[1] By 1982, the number is expected to reach 70 million.[2] The cost of these dental benefits will be substantial and will be a major expense to American industry.

From 1970 to 1977, the amount of money spent for dental care more than doubled, going from $4.4 to $10.0 billion.[3] The primary cause of this rapid rise in expenditures is not inflation in dentist's fees. The average dental fee is increasing at about the same rate as the Consumer Price Index (CPI). This is in sharp contrast to hospital costs and physicians' fees which are rising at rates substantially above that of the CPI.[4]

The total amount of money spent on dental care has increased because dentists are treating a larger percentage of a growing population (about 50 per cent),[5] providing more services to each patient,* and providing more of the expensive services.[6] Therefore, the key cost issue in the near future is more likely to arise from the expansion of the level and change in the composition of demand.

The purpose of this paper is to explain how dental insurance influences the utilization and cost of dental services and to review the major cost control options available to purchasers of dental plans.

Dental Care and Insurance

Several interrelated features of dentistry and dental insurance contribute to increasing the monies spent for dental care. First, it is important to note that almost all people have some form of treatable dental disease.[7] Thus, dental insurance is not "insurance" in the same sense as hospitalization or life insurance which involve unpredictable events for the individual, occurring at a known rate in the population. Dental insurance is actually a prepaid budget plan with premiums calculated on the basis of actuarial predictions of utilization of dental services by the insured group.

Two good predictors of utilization are income and education.[8] As family income increases, the utilization of dental services increases at an even faster rate. Education of the household head is also important: fewer years of schooling are associated with lower utilization rates, even when the financial barriers to dental care are removed.[9] When employees and their dependents obtain dental benefits which reduce their out-of-pocket expenses for dental care, the number of people visiting the dentist one or more times per year increases. However, the increase is not very great. The more important effect of dental insurance, especially in terms of expenditures, is to change the mix of services received by

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*Doherty N: Economics of the Production of Dental Care, 1950-76. Unpublished manuscript.

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those who go to the dentist.[9] There is a significant increase in the utilization of the more expensive elective dental services, such as crowns and bridges.

This results from the fact that once the patient seeks care, it is the dentist and not the patient who determines what services are needed. This, in effect, means that the dentist has substantial control over the demand for services. Consequently, when dental insurance removes all or part of the patient's financial barriers to care, the treatment recommended by the dentist is more likely to be accepted by the patient.

Finally, it is important to stress that the ultimate goal of dental insurance should be to improve the oral health of beneficiaries. Providing financial access for more services is only an intermediary goal and not an end in itself. Therefore, the relationship between the utilization of dental services and oral health becomes a major consideration in evaluating the effect of different cost control programs.

In the next section, three main strategies for controlling expenditures are discussed. These include: 1) regulatory systems for monitoring cost and quality; 2) prepaid group practices; and 3) the structure of the insurance benefit plan.

Regulatory Systems

There is considerable interest in developing effective review systems for assuring that the dental care received by beneficiaries is necessary, appropriate, and of good technical quality. An effective utilization review system should limit over-utilization and thereby reduce the monies spent for dental programs.

Most insurance companies routinely monitor services that dentists provide through a system called pretreatment review. Dentists are asked to submit their treatment plans and patient radiographs for all courses of treatment costing over a certain dollar amount, usually $100 to $150. These claims constitute only 20 per cent of all claims but, because they involve the more expensive, elective services, they include about 80 per cent of total service expenditures.[10] Dentists employed by the insurance company review the pretreatment claims and deny benefits for specific services if adequate justification for the services cannot be established or if, in their judgment, less expensive services are equally acceptable.

Through this system, the insurance carrier may save from three to five per cent of total gross premiums: their operating cost may range from one to two per cent.[11] In addition to this direct saving, the knowledge that they will be reviewed** probably makes dentists more conservative in their treatment plans. The specific monetary impact of this indirect effect on program costs is not known.

While the pretreatment review system has some clear benefits, its overall effect is limited. The cost of the system must include the administrative costs to the insurance company and to the dentist for handling the pretreatment claims and radiographs. Another problem is the antagonism the system engenders in the dental practitioners who have their treatment plan questioned by insurance company dentists unfamiliar with their patients personally and without access to the same clinical information. A third deficiency with this system is that the patient may end up paying out-of-pocket for the services denied. Thus, while the insurance plan may save money, the costs are simply transferred to patients.

A more promising utilization review system integrates pretreatment review with the periodic profiling of the pattern of services provided in practices. These profiles are based on claim data already available in the computer and can, therefore, be generated with little extra costs. Sophisticated profile methods are now becoming available, which should prove more effective in identifying dentists who are over-providing.***

Assuming that the pretreatment review of claims and profile analyses will make existing third-party utilization review systems more effective in detecting fraud and over-utilization, there is still some question as to how much would actually be saved. A rough estimate based on computer simulation indicates that, at most, perhaps eight per cent of total premium dollars could be saved.[11] This is a substantial increase over existing savings but must be weighed against the cost for operating these more complex review programs, estimated at two to three per cent of total claim costs.

In summary, pretreatment review is having an important but limited impact in controlling program costs. More effective review methods are being developed, but even when these new methods are available, it may be difficult to achieve major savings in dental expenditures.

Prepaid Group Dental Practices

Employee benefit dollars are usually administered by insurance companies who reimburse beneficiaries for dental services they receive in the offices of fee-for-service dentists. Under this payment system, dentists have financial incentives to provide a greater number of services and more of the expensive services to their patients. This does not mean that fee-for-service dentists are necessarily over-treating their patients because of these financial incentives. Although some over-treatment exists, ongoing research shows that the majority of dentists provide services within acceptable guidelines for necessity and appropriateness.* However, these guidelines are very broad, and dentists have considerable latitude in deciding which services to offer patients. It is in this gray zone of clinical decision-making where the financial incentives of the dentist can encourage the use of the more expensive and elective services.

**Informal reports from insurance carriers suggest that the percentage of rejected services is quite high for new plans where dentists have not experienced pretreatment review. Once dentists become aware of this review system, fewer unacceptable claims are submitted.

***Bailit HL: Dental Practice Profiles: A Quality Assessment Model, NCHSR Grant No. HSO1545, 1978. Unpublished progress report.

*Bailit HL: Third Party Quality Assurance Systems for Dentists, NCHSR Grant No. HSO1824, 1976-79. Unpublished progress report.

In contrast to the fee-for-service system, dentists in prepaid group dental practices (PGDP) have a financial incentive to provide a less expensive mix of services. This is because prepaid group practices negotiate fixed price contracts to provide a predefined set of dental services to the beneficiaries. As such, the owners of PGDPs should increase profits if patients receive less care.

For ethical practitioners, this financial incentive system should, theoretically, result in an emphasis on services which prevent disease and which treat existing disease for the least cost. Obviously, for unscrupulous dentists, this incentive system could result in patients not receiving needed services. However, there is no *a priori* reason to believe that under-utilization in the PGDP system is any more of a problem, either in terms of costs or patient health, than over-utilization in the fee-for-service practice organization.

The evidence for the cost-effectiveness of PGDP is indirect at this time. Most of the data on the advantages of this type of practice come from medicine, where one form of prepaid group medical practice, the Health Maintenance Organization (HMO), is known to be 20 to 30 per cent less costly than conventional methods for providing care.[12] The apparent reason for this cost advantage is a reduction in the rate of hospitalization for patients enrolled in HMOs. Since there are no data to indicate that HMO patients are less healthy because of lower hospitalization rates, physicians are evidently able to offer patients the same level of health with less costly patterns of care.

Prepaid group dental practices may also reduce program costs through the provision of a different but acceptable pattern of services to patients. The extent of the savings can only be approximated, but because dentistry does not involve the use of very expensive institutional care and technology, the amount will probably not average more than 10 per cent of the cost of fee-for-service dental plans. This assumes that the benefit plan for the prepaid group practice patients is comparable to that for fee-for-service patients in terms of covered services, exclusions, and other program limitations.

A second potential advantage of PGDP is that the contract between the benefit fund and the provider group is negotiated through a competitive bidding system. Price competition among PGDPs should have the effect of reducing the cost of contracts. While it is true that insurance companies also compete for dental contracts, the carriers do not own and, therefore, do not control delivery systems to the same extent as PGDPs. The direct control of the provision of care allows PGDPs a greater margin of certainty on the services patients will receive and, hence, the actual expenditures for dental programs.

A final factor often mentioned as an advantage of PGDP is the efficiencies related to economies of scale in the use of facilities, equipment, and personnel. Because PGDPs are larger and more complex organizations than solo practices, some have suggested that they are better able to utilize resources efficiently and produce services at a lower unit cost. Actually, there is little evidence to support the contention[13] and, in any case, the unit cost of services is not currently the critical issue. Of greater significance is the total monies spent for delivering dental care to the insured population and, as noted, because of differences in service patterns, prepaid group practice should have the advantage.

An industry interested in offering employees a prepaid group dental option has several problems. Foremost among them is the fact that there are very few prepaid dental group practices available. Most of the established HMOs in this country do not offer dental services, and there are probably fewer than 100 "free standing" prepaid dental group practices in the country.** Although the number of PGDPs is rising, it may be some time before PGDPs become a viable delivery alternative.

Of course, it is possible for the benefit fund to set up and operate its own dental group practice. However, this would require a large initial capital investment as well as the organizational and managerial resources to operate the practice efficiently. Thus, while the PGDP approach to controlling costs has certain potential advantages, its impact is unlikely to be felt in the next five to ten years, unless there are unforeseen changes in current trends.

Benefit Structure

The structure of benefit plans is a major determinant of the amount and types of services patients receive and, in turn, the cost of dental programs. The more comprehensive the plan and the smaller the out-of-pocket financial contribution of patients, the more costly the dental plan. This means that substantial savings in dental care programs are possible through changing the structure of dental benefit plans.

In an attempt to control costs, it must be remembered that a major objective of dental insurance should be to improve oral health. Clearly, it is easy to save money by limiting dental plan benefits. However, at some point, this will presumably result in less oral health. Operationally, this means that the fundamental issue facing benefit fund managers is the development of a dental plan that will produce the greatest improvement in oral health with the funds available. From an economic point of view, the problem can be stated in terms of the marginal return in dental health that can be achieved with greater investment in dental services, i.e., there comes a point where further investment in dental services produces very little increase in oral health. The problem, then, is identifying that level of investment where the marginal costs equal the marginal benefits in health. Furthermore, it is not only how much money is spent for dental services that matters but also the specific services which are purchased. In terms of improving health, some services may have greater benefit than others.

To determine if savings can be achieved through modification of benefit structures, without a reduction in oral health, it is first necessary to know something about the utilization frequency of specific services in the usual dental plan.

**In 1971 there were 27 prepaid group dental practices. See reference 14. Undoubtedly, the number of prepaid group practices has increased, but there are no data available on the exact number. Informal conversations with national leaders in this area suggest that fewer than 100 are in actual operation.

TABLE 1—The Percentage of Patients Receiving a Service and the Percentage of Total Charges for the Service in an Insured Population

Service	Percentage of Patients Receiving One or More Services per Year	Percentage of Total Charges*
Examinations	77.7	4.0
Radiographs	82.0	7.3
Prophylaxes	79.7	7.1
Amalgams and Composites	64.1	25.7
Extractions	11.6	2.1
Full and Partial Dentures	2.5	6.7
Crowns	6.4	11.6
Bridges	3.5	18.8

*Approximately 17% of total charges are for services not included in this Table.

For each major category of service, Table 1 gives the percentage of patients who receive the service and the contribution of the service to total (both insurance plan and patient) service charges during a one-year period.***

It is apparent from Table 1 that the services that most people (i.e., 60 per cent or more) receive account for 44.1 per cent of program costs. At the other extreme, only 10 per cent of the population receive bridges or crowns but these services account for 30.4 per cent of program costs. The obvious question is, does this expenditure of so much money for so few people make sense in attempting to improve the oral health of the entire, eligible population? A related question is whether these services substantially improve the oral health of the patient who receives them. Definitive answers to these questions are complex and beyond the scope of this paper, but using bridge services as an example, some insights can be gained by further analysis.

First, it is important to consider the need for bridges in the population. If bridges are needed because of dental problems which occur seldom, but, when they do occur, make the service absolutely necessary to maintain oral health, there would be little question of their value. However, the fact is that the oral conditions needed for the insertion of bridges are not rare events and are not limited to just a small percentage of the patient population. Between the ages of 18 to 34 years, it is estimated that the average person has six teeth missing.[15] Therefore, even if bridges are beneficial to those who receive them, so few of the insured persons who could benefit from this service receive it that the present utilization pattern for bridges cannot have a major impact on the oral health of the total eligible population.

This conclusion raises several policy questions: 1) Is it possible or desirable to increase the utilization of bridges so that all those who need this service receive it?; and 2) If the money spent for bridges were used to increase the utilization of other services, would this be a more cost-effective method of improving health? Each of these options are briefly discussed.

***Bailit HL and Raskin M: Unpublished data from Blue Cross and Blue Shield of Greater New York, 1978.

Depending on age, sex, and socioeconomic class, in the general population the percentage of adults with fixed bridges ranges from two to seven per cent.[16] Since the majority of adults have one or more missing teeth which could be replaced, the potential cost of providing bridges to an entire population of insured persons would be beyond the capacity of even the most generous benefit fund. This service may always have to be rationed by patient income.

Even ignoring the cost constraints, would the oral health of the population increase if all those who needed a bridge received one? Surprisingly, for all the money spent on this service, there are few longitudinal studies on the effectiveness of bridges in improving oral health. For certain cases, such as people with missing front teeth, it is obvious that a bridge is necessary but, for many other cases, the answer is not so clear. No definite conclusions can be drawn at this time, and research is clearly needed to determine the cost-effectiveness of bridges as an oral health benefit.

This leaves consideration of the second policy option—eliminating most types of bridges as a covered benefit and using these funds to either decrease program costs (projected savings of 10 to 20 per cent) or to increase the utilization of other dental services. The first alternative is a consideration if the benefit fund has other non-dental fringe benefits which it considers more important than the additional dental care. The second alternative—increasing the utilization of other dental services—makes sense if these other services substantially improve the oral health of the insured population.

Several treatments are available which, if properly used, could have a major effect in preventing dental disease. These include the application of topical fluorides to the teeth of children,[17] dental health education aimed at improving oral hygiene practices,[18] and prophylaxes (tooth cleanings).[19] Some of these services are now covered in dental insurance plans but have restrictions on the frequency of use. For example, prophylaxes are usually allowed once every six months. The effectiveness of this rate of use has not been demonstrated, but there is growing evidence that prophylaxes every two months can have a dramatic effect on improving oral health.[19] Thus, insurance plans which allow more frequent provision of these preventive methods should theoretically promote better oral health. This means that the cost per unit of health would, in effect, be reduced.

In conclusion, the issue of which services to include in dental plans is becoming the central focus in attempts to control dental costs. Clearly, the rational approach is to give priority to those services which are most cost-effective in producing oral health for the greatest number of people. Services which have a small marginal benefit or are of benefit to very few people should not be included in the benefit plan.

Indeed, there is a growing realization that there are limits to the effectiveness of dental (or medical) services in producing health. This was not an issue in the past when most people paid for health services out-of-pocket; limits on personal income served as an effective rationing device. Now that more and more care is paid for by a third party (public or private), the consumer demand for services is increasing.

The challenge is to convince the general public that more comprehensive dental plans with fewer financial constraints will not necessarily lead to better oral health.

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Dr. Johnson on Smoking—19 August 1773

"We talked of change of manners. . . . Smoking has gone out. To be sure, it is a shocking thing—blowing smoke out of our mouths into other people's mouths, eyes, and noses, and having the same thing done to us. Yet I cannot account why a thing that requires so little exertion and yet preserves the mind from total vacuity, should have gone out. Every man has something by which he calms himself: beating with his feet or so."

Boswell's Journal of a Tour to the Hebrides with Samuel Johnson, LL.D. 1773. Edited by Frederick A. Pottle. McGraw-Hill Book Company, Inc. New York, 1936. p. 39. (contributed by William M. Schmidt, MD)