
Management of Health Service Delivery and Professional Productivity: A Case Study Model

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ACCOUNTABILITY by the health care system for both quality and economy of care did not become a public issue until the 1960s. Before the mid-1960s, recourse for medical services of unacceptable quality was limited to the rare malpractice suit, and individual consumers of health care had few options for exerting economic control over the marketplace.

After the Medicare and Medicaid amendments to the Social Security Act were enacted in 1965, the costs of these two programs rose to unexpected levels and absorbed an increasing proportion of the GNP. As a consequence, the public sector mandated participation and control (public accountability) to assure that society receives full value from public expenditures. When the Federal Government, in 1972, mandated PSROs (professional standards review organizations) to establish norms for diagnosis and treatment, health care institutions heightened their attention to developing and implementing quality assurance systems, and local medical societies began to recognize members who completed continuing education programs.

Another facet of accountability concerns the use of both nonhuman (facilities, supplies, and equipment) and human resources. The Federal Government mandated capacity-utilization review in hospitals in an effort to reduce health care expenses that might result from unnecessarily long hospitalization. State and Federal Governments enacted certificate-of-need legislation to prevent oversupply of facilities and certain sophisticated costly equipment. Use of human resources, however, has

been left largely to the discretion of individual institutions.

Professional Productivity

Quality and quantity are the major variables in the health care delivery system. Criteria for adequate health care for the individual recipient can be set within a wide range. The more stringent the quality criteria, the fewer the persons who will receive care meeting the criteria. Beyond that, as the components of quality and quantity of service are redefined, expanded, or otherwise manipulated, more or less elasticity is introduced into their relationship.

The productivity of any institution delivering health care can be measured as some relationship of the output of services to the resources consumed in delivering them. The measure of human resources consumed is a product of the number of laborers (for example, physicians, nurses, laundry workers, engineers) and the time input of each. Professional time input in relation to services delivered, or professional productivity, is an aspect of the equation of accountability that has received little attention to date, although a practitioner's productivity contributes significantly to the elasticity in the health care equation. The larger the number and variety of personal and institutional activities making no contribution to the service delivery of the practitioner, the lower his individual and institutional productivity and the greater the cost per unit of service to the recipient.

Our focus here is on some significant components in the relationship between professional productivity and costs in the health care system. Although the case study we present is that of a hearing and speech division of a pediatric medical center, the underlying principles are applicable to many kinds of service programs.

The consideration of establishing guidelines that define an appropriate level of professional productivity imposes a series of questions for which there are no

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apparent historical answers. How much time need one spend in continuing education to maintain one's quality of care delivery? How many economies might such educational processes be expected to add to one's service delivery, perhaps increasing productivity more than enough to offset the cost of acquiring these economies? What proportion of the clinician's time is used appropriately in coordinating delivery of services (health, recreational, educational, and social, for example) to maximize the value of the collective? What is a reasonable level of support services for management to provide presumably to free the clinician from spending otherwise professionally productive time in providing support services?

Because of the lack of available guidelines concerning the preceding and other questions, the Hearing and Speech Division (H&SD) of the Children's Hospital Medical Center of Boston undertook a continuing study of appropriate levels of professional productivity. We present the conceptual model for organizing the approaches to the study, the important considerations in establishing a first approach to a professional productivity agreement with practitioners, and the results of a year's experience with the system that evolved. The charts project results expected from the manipulation of variables open to control by management.

Case Study, Historical Background

The Children's Hospital Medical Center, a tertiary care facility with a major commitment to research and teaching, includes a sizable ambulatory service and a 350-bed hospital. The hearing and speech division is a component of ambulatory services.

When the ambulatory services building was constructed, the H&SD was built into one of its floors because of the need for special design and construction to accommodate prefabricated sound-testing suites and for observation corridors adjoining examining rooms. An implication of this special construction was

that the H&SD initially had an excess capacity and a fixed cost of operation. Also, the audiology component of the division could not expand beyond its initial six sound suites without incurring significant alteration and renovation costs. The division management became concerned with its fiscal accountability because it suffered a chronic and substantial operating deficit. Could the division run a high-quality program and cover all the costs of that program by an equitable system of charges to patients, and if not, why not?

The division's practices were studied, and the components of its budget and their interrelationships were reviewed. This study resulted in the development of a system for organization of professional time and in a number of changes designed to enhance professional productivity in relation to the costs of providing services, primarily through changes in the physical facility, staff size, and the system of charges to patients.

The H&SD is composed of four units: (a) the audiology unit, which reports to a senior audiologist, (b) the special services unit comprising two part-time psychologists, a part-time social worker, a child development specialist, and a teacher for the hearing impaired, (c) the speech and language unit which, with the special services unit, reports to the senior speech and language pathologist, and (d) the administrative unit comprising clerk-receptionists and secretaries, who report to the administrative service coordinator. The three supervisors report to the director of the H&SD. The supervisors, the director, and the social worker compose the service team, which is the ambulatory services' organizational unit responsible for programmatic and administrative decision making for the division.

Children and their families are seen for a variety of diagnostic and therapy services in the division. For most types of communicative disorders, children are seen on the H&SD floor; for other types, such as a child with cleft palate or an infant requiring special feeding, the staff members see them in another location in the

medical center. Some H&SD staff provide services outside of the medical center—for example, consulting to staff of a residence for retarded citizens and training and quality assurance to a hearing screening program in a community health center. Most of the service to patients is devoted to evaluation.

The Decision Making Process

A series of decisions was made to determine the desired staff size and composition of the unit. The primary decision was that the unit should generate fees that would offset all of its direct costs (salaries, fringe benefits, supplies, and other direct expenses excluding capital equipment) plus an additional 50 percent to cover all indirect costs (telephone, space rental, use of medical records, typing pool, security, equipment depreciation, and so forth).

Another decision was that all the clinic space on the H&SD floor would be used routinely, particularly all the prefabricated sound suites. Implementing this decision would require generation of a sufficient number of patients requesting hearing services, at the potential cost of reducing the availability of other (nonhearing) services. (As a matter of historical perspective, for about 5 years before this planning was initiated approximately 3 full-time audiologists—2.8 full-time equivalents—were performing hearing evaluations. Therefore, the decision to have a patient population that would require six or more clinicians was robust.)

Adequate administrative support for clinicians required telephone coverage; patient scheduling, handling, and billing; and secretaries to make minor corrections on the reports when necessary, to duplicate the reports for transmission and insertion into the patients' records, and to give prompt attention to emergency reports and letters. A first estimate of the necessary level of secretarial assistance was made. It was anticipated that all administrative support services necessary for full use of the H&SD floor would also be required for any lesser use of the floor, and a fixed expense for operations was estimated. Added to this fixed expense, or the proportion assigned to a particular component of the division (speech and language or audiology), was a variable expense comprising the average salary plus fringe benefit cost per clinician. This procedure yielded a positively sloped line projecting the total costs of the divisional component for any given number of full-time equivalent (FTE) clinicians. The relationships among fees per hour of service delivery, hours of service delivery billed per year, and the number of FTEs required to balance the division's budget, including overhead contribution, are shown in figures 1 and 2 for an ETOB operation ("every tub on its own bottom," an operation in which each unit must

be responsible for its fiscal integrity). Because the appraisal of hearing requires massive sound-isolated rooms and specialized equipment, the overhead contribution required of an audiologist was increased over that of the other clinicians in the division to incorporate the greater expense for capital equipment depreciation and the larger space requirement per FTE clinician.

In figures 1 and 2, revenue projections emanate from the origin. Revenues were calculated at varying weekly productivity levels and varying hourly charge rates for differing annual numbers of productive weeks (displayed here at \$31 per hour for speech and language and \$47 per hour for audiology for 42 working weeks per year).

An early staff decision was that certain types of services offered within the division would be carried at a "loss." For example, the H&SD would provide certain psychological services to patients and to their families as well as consultation to other professional staff, and the costs for these special services, over and above direct patient billings by the staff psychologist, would be absorbed by other service components in the division. The result of this decision was to increase the fixed expenses "baseline" in figures 1 and 2, as shown in figures 3 and 4.

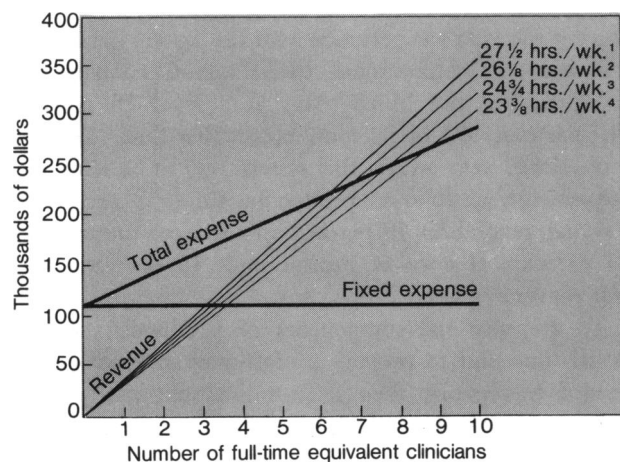
The third major decision following the decisions on a balanced budget overall and the non-ETOB operation was to define and quantify productivity for the professional. As a basis for this decision, a survey was undertaken of the current daily activities of all the clinicians in the division over an extended time. After this survey, the following agreements were reached:

- Approximately 2 hours daily (of a 7½ hour workday) were estimated as nonrecoverable to direct service productivity. The activities requiring this amount of time included locating misplaced records, redictating lost reports, uncompleted telephone coordination, and the like. As a result, some 73 percent of the average working day was to be billed, or 27.5 hours per full working week.
- Medical center personnel policies established a 4-week vacation plus 10 paid holidays a year. Additionally, each employee accrued 12 paid sick-leave days a year (because it was expected that staff would not use all sick leave yearly, 9 days a year were included in the calculations to establish a productivity agreement).
- The division would use the morning of the last working day each month routinely for inservice training; therefore, 6 working days a year could be removed from billable time for inservice training.
- The state of the art across the entire field of communicative disorders has been changing rapidly. A need was recognized for a formal system of assuring that all

professional staff had opportunities for professional development, that the care delivered in the program was at a level commensurate with the current state of the art, and that advancement of the discipline would be nurtured. An additional 5 days of paid leave a year were granted for individual professional development through attendance at national and regional meetings.

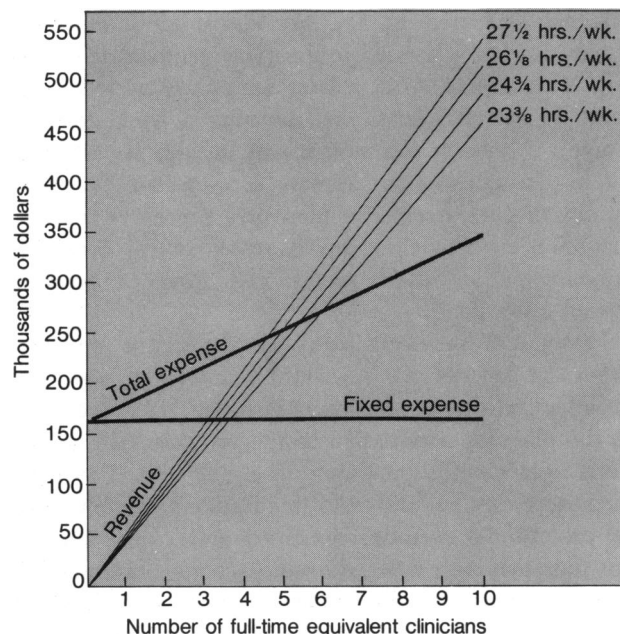
- Most clinicians engaged in activities daily which, while directly related to service delivery, were not bill-

Figure 1. Annual speech and language expense and revenue projections for 3 specified conditions: \$31 per hour, 42 weeks per year, and each unit responsible for its fiscal integrity



- ¹ Equivalent to 0 percent credit expectation.
- ² Equivalent to 5 percent credit expectation.
- ³ Equivalent to 10 percent credit expectation.
- ⁴ Equivalent to 15 percent credit expectation.

Figure 2. Annual audiology expense and revenue projections for 3 specified conditions: \$47 per hour, 42 weeks per year, and each unit responsible for its fiscal integrity



able by the H&SD. They performed some of these services as members of an interdisciplinary team. For the team's services, the patient paid a single fee (which might have been equitably divided among the various services but seldom covered the service delivery costs of the combination of professionals present). Other activities included attending interdisciplinary staff meetings on patients; a clinician's assisting another clinician, for which the patient was billed only for the latter clinician's service; and spending time on behalf of a patient during a school visit. For all of these direct services that were not directly billable, the clinician was

Figure 3. Annual speech and language expense and revenue projections for 3 specified conditions: \$31 per hour, 42 weeks per year, and expanded fixed expense

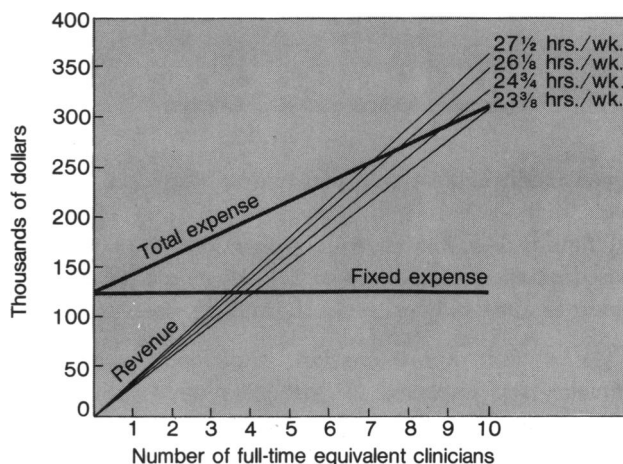


Figure 4. Annual audiology expense and revenue projections for 3 specific conditions: \$47 per hour, 42 weeks per year, and expanded fixed expense

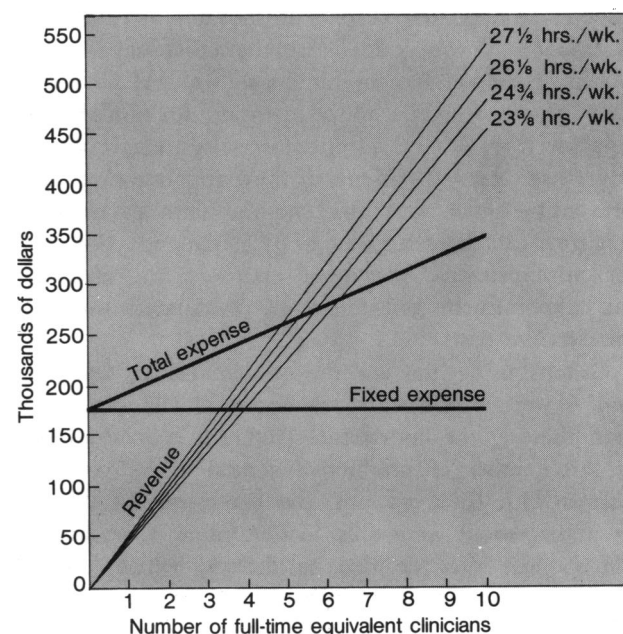
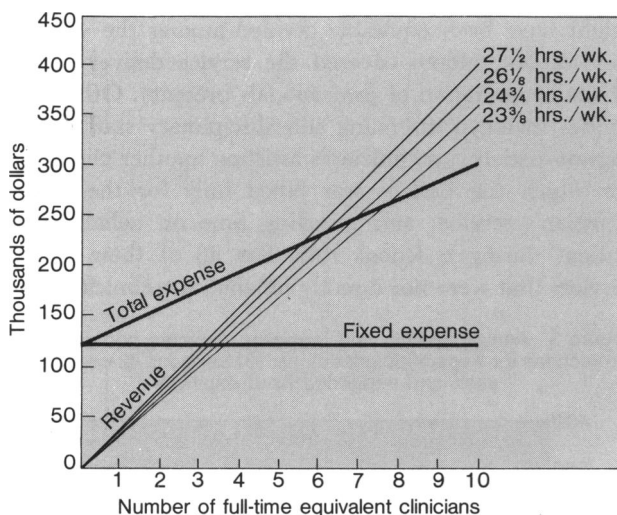


Figure 5. Annual speech and language expense and revenue projections for 3 specified conditions: \$35 per hour, 42 weeks per year, and expanded fixed expense



given credit against expected billings per week, on the basis that an hour's billing equals an hour of credit. In figures 1-5, the revenue projections displayed are based on expected billings of 27.5 hours a week and on credit against billings at 5, 10, and 15 percent.

As a first approximation, therefore, each FTE clinician was expected to produce patient billings for 27½ hours a week for 42 weeks of the year, or to be productive for 59.23 percent of the year, with billable time or credit time counted equally toward productivity.

The shift of responsibility for maintaining an agreed-upon level of professional productivity from a manager to the individual clinician requires agreement about patients who do not keep ("no shows") or cancel appointments. It was decided that the individual clinician would be responsible for his no shows, and he would have to overschedule to compensate for his average no-show rate. A clerk-receptionist telephones 1 day in advance to remind patients of their appointments, thus preventing some no shows; appointments canceled at this time can then be given to other patients. The costs for administrative personnel necessary to carry out this appointment procedure are calculated into administrative costs.

Graphs using the expense projections in figures 3 and 4 were produced to demonstrate the impact of manipulating the hourly rate (figure 5 is an example) or the number of productive annual weeks, or both. Armed with these options, the professional staff and its management were able to determine, from among the services they decided to deliver, which options would be economically feasible.

An important factor in maintaining a balanced

budget in the division is that activities of professional staff contributing directly to patient service but not locally billable by the division are shown as credits against projected revenues. The dollar equivalent of these service contributions are reported to central administration with the actual billings of the division so that although they represent only "theoretical billings," they are part of the presentation-of-self of the division in its contribution to the medical center both in service and in revenue generation. The table is a typical monthly report.

Results

During the year's experience with the system described, the division's commitment to its service contribution (credited but not billed) was at a level 16 percent (10 parts of 59) of its total productive time. Thus, a professional year within this system was to be allocated theoretically as follows: productive time, 59 percent—revenue generation 49 percent and service contribution 10 percent; absence of professionals 19 percent; and unrecoverable time 21 percent.

To measure the components of productive professional time and to provide professional staff with data needed to organize their time individually and collectively, a management information system was established. The components of the system were a tracking process of the individual clinician's productive time; established goals and routine feedback of performance measured against goals; and an accounting of the component of a professional year spent in service contribution (credited) activities.

The performance of a clinician is measured in a way that provides a basis for learning the cause of a deficiency. Measurement also provides a mechanism for a clinician to increase productivity temporarily to a level sufficient to offset a later temporary decrease (in order to attend a class one morning a week, for example). Although this system was initially threatening for professionals whose primary concerns are for their quality of care, over time there is a process of accommodation so that clinicians increase control over the organization of their professional time to achieve agreed-upon goals.

Many staff members expressed significant anxieties when the concept of an accountability system was first broached. However, the engagement of interested staff in the planning and design of the professional productivity agreement throughout all stages helped to ease these anxieties, as did staff realization that not only all professional decisions remained under their control but that they also now had more accurate information about the financial implications of their decisions than previously. All feedback information is routinely avail-

able to all staff, and program decisions arise from staff discussion and "sense of meeting discussion."

Comment

Two years' experience with the system has shown that the professional productivity agreement is a useful management tool. Both the speech and language and the audiology section staffs exceeded their yearly billing expectations (by 1 and 3 percent, respectively), as did the special services section. Credit hours accounted for 16 percent of the approximately 15,000 total yearly professional hours covered by the agreement. More importantly, suggestions offered for alterations in services

could be examined for their financial as well as their professional implications before a staff decision on whether to implement the change.

The process by which these issues of accountability, particularly the component of provider productivity and its ramifications, can be dealt with is one whose basic principles are generalizable throughout the health care system. Responses to the issues will be individualized by disciplines, by programs, and by institutions. The experience of the Children's Hospital Medical Center Hearing and Speech Division is offered not as an ideal but as an example of the processes involved in formulating and implementing a set of decisions.

Report of hearing and speech division contribution to medical center, December 1977

<i>Clinic and date</i>	<i>Number of patients seen</i>	<i>Unit charge equivalent</i>	<i>Total</i>
Medical diagnostic clinic			
December 2	10	¹ \$35.00	\$350.00
December 9	8	35.00	280.00
December 16	8	35.00	280.00
December 23	8	35.00	280.00
Monthly total			\$1,190.00
Learning disabilities program:			
Full value of time charges, audiology			1,292.50
Value of time given to learning disabilities clinic			—495.00
Full value of time charges, speech and language			852.50
Value of time given to learning disabilities clinic			—540.00
Monthly total			\$1,110.00
Developmental consultation program:			
December 5	2	² 31.50	63.00
December 7	1	31.50	31.50
December 12	1	31.50	31.50
December 17	1	31.50	31.50
December 19	2	31.50	63.00
December 28	2	31.50	63.00
Monthly total			\$ 283.50
Cranio-facial program:			
December 9		³ 47.00/hr.	141.00
December 9		⁴ 31.00/hr.	77.50
December 16		47.00/hr.	141.00
December 16		31.00/hr.	77.50
Monthly total			\$ 437.00
Lead study:			
December 7	1	47.00/hr.	94.00
Reimbursement			—40.00
Monthly total			\$ 54.00
Total contribution			\$3,074.50

¹ Equivalent to 45 minutes of audiology.

² Equivalent to 1 hour of speech and language.

³ Charge is for consultation time made available by audiologist, who sometimes evaluated patients and sometimes did only chart review. Charge is equivalent to 3 billing hours of audiological services.

⁴ Charge is equivalent to 2½ hours of speech and language billing because of regular presence of speech and language clinician.