CHAPTER

1

ESSENTIALS OF FULL-COST ACCOUNTING

LEARNING OBJECTIVES

Upon completing this chapter, you should know about

- The potential uses of full-cost information
- The relationship between full-cost accounting and the economist's three factors of production: land, labor, and capital
- Concepts such as *cost object, cost center, direct* and *indirect costs, overhead,* and *cost allocation methods*
- The distinction between *mission centers* and *service centers*
- Alternative ways to allocate service costs into mission centers so as to determine each mission center's full cost

In almost all organizations, managers need to answer the question "What did it cost?" It is especially important for those health care organizations whose prices are set by insurers or other third-party payers, or when senior management needs to assess the financial viability of different programs and services.

Answering the question is easy if we are discussing the purchase of inputs, such as supplies and labor, for the service-delivery process. Even calculating the full cost of a unit produced—whether it is a surgical procedure or fifty minutes of psychotherapy—is relatively easy as long as the organization produces goods or services that are completely homogeneous. Complications arise when an organization provides multiple goods and services that require different kinds and amounts of resource inputs.

This chapter identifies some of the key decisions made in a full-cost accounting system and discusses how they influence an answer to "What did it cost?" As you read the chapter, you should be aware that there is considerable disagreement among managers and accountants about whether full cost is an appropriate calculation. Some accountants believe (for reasons that you will see in the chapter) that any such computation is inherently distorted and therefore of little value for managerial decision-making. Nevertheless, we will assume for the moment that senior management wishes to know the full cost of a particular good or service, and we will examine the choices it must make to arrive at that figure.

ORGANIZATION OF THE CHAPTER

The chapter begins with a discussion of the uses of full-cost information. It then turns to the issues that must be considered in calculating full cost and links them to the economist's three factors of production: land, labor, and capital. Next, it outlines the decisions that must be made in calculating full costs, or the *cost accounting methodology.* The chapter concludes by looking at the effect of the cost accounting methodology on pricing an organization's services.

USES OF COST INFORMATION

Information on the cost of carrying out a particular endeavor is used for essentially three purposes: pricing decisions, profitability assessments, and comparative analyses. Most managers use cost information for one or all of these purposes at different times and under varying decision-making scenarios.

Pricing Decisions

Cost information is not the only information that management uses in setting prices, but it is an important ingredient. In negotiating a contract with a managed care organization or a commercial payer, for example, a hospital or physician group practice is at a significant disadvantage if it does not know its full cost for the service under discussion. Even if its goal is to obtain a large volume of new patients by offering a price below its full

cost, it needs to know the full cost. Otherwise, it will be at a distinct disadvantage in the negotiations.

Profitability Assessments

By contrast, many health care organizations are *price taker*s—they must accept the price that has been set by a third-party payer, such as Medicare or Medicaid. For these organizations, full-cost information allows senior management to assess whether a particular program or service is financially viable. Indeed, if a program or service is not covering its full cost, it is by definition a *loss leader.* Because an organization cannot survive if all its programs or services are loss leaders, full cost accounting serves to highlight where the cross-subsidization among them is taking place. This allows management to assess whether that cross-subsidization is consistent with the organization's overall strategy and, if it is not, to take corrective action.

Comparative Analyses

Many organizations can benefit from comparing their costs with those of organizations delivering similar programs or services. For example, an integrated delivery system (IDS) with a network of physician group practices, hospitals, and other service delivery units may make comparisons among similar entities. Full-cost information can assist in this effort.

One difficulty with comparative analyses is that not all organizations of the same type measure their costs in the same way. Typically, this is not a concern for an integrated delivery system, because the cost accounting effort for, say, its physician group practices can be specified in detail. Otherwise, an organization attempting a comparison with like entities may encounter a variety of methodological impediments.

PROBLEM

Concord Health Network, an integrated delivery system, is interested in comparing its cost per patient with the per-patient cost in a similar IDS. What are some of the issues it must consider in making this comparison? Please write out some of your thoughts before reading the analysis that follows.

■■■

It is extremely important that you write out your own answer before looking at the one given. Please do not shortcut this feature of the learning process. If you have not written out an answer yet, please do so before you continue reading.

ANSWER

Concord must consider such comparability issues as the average occupancy rate of its hospitals; the existence of specialized programs in, say, cardiology or oncology; and the provision of services such as social work and discharge planning. It also must consider whether it wishes to focus on an episode of illness, a hospitalization, or something else, and it must decide whether it wishes to include outpatient and/or home care costs in the comparison.

As this answer suggests, the definition of what is to be included in a full-cost calculation is by no means clear cut. Indeed, because such a wide range of choices is embedded in an organization's cost accounting system, managers frequently find it difficult to compare their organization's costs with those of other organizations, where the choices may have been made differently.

EXAMPLE

A study that compared the cost of an outpatient visit in a hospital with the cost of a similar visit in a physician's office identified two impediments to the comparison. One factor was noncomparable costs. For example, because of the way the hospital allocated its overhead costs, a fraction of the cost of the chaplain's office was included in the cost of each outpatient visit—there was nothing comparable in the physician's office. The other factor was scale-related costs. In a hospital, the cost of governance was high, entailing a great deal of time, effort, and expense to work with the hospital's board of trustees. Governance in a physician's office was much simpler.[1]

Because of these impediments, many organizations simply make comparisons of their own costs over time rather than with other organizations. They know that their full-cost methodology has remained reasonably consistent from one year to the next and therefore that there will not be problems with either noncomparable or scale-related costs.

ISSUES TO CONSIDER IN CALCULATING FULL COSTS

If senior management does not wish to use full-cost information for pricing decisions, profitability assessments, or comparative analyses, it does not need to become involved in the effort to calculate full costs. Rather, it can delegate the task to the accounting staff. Although Medicare has paid hospitals on the basis of diagnosis-related groups (DRGs) for over 25 years, it continues to require hospitals to prepare a full-cost report. In general,

however, such a report is of little interest to senior managers, and they can simply ask the accounting staff to prepare it as quickly and as easily as possible.

On the other hand, when a hospital or academic medical center contracts with the federal government to do research, senior management no doubt will want to be more closely involved with the full-cost accounting effort. This is because the full-cost analysis must be prepared in accordance with the principles set forth in the Office of Management and Budget's Circular A-21, "Cost Principles for Educational Institutions." These principles provide for reimbursement of direct costs plus an "equitable share" of overhead costs. Overhead costs include depreciation of buildings and equipment, operation and maintenance of plant, general administration, departmental administration, student administration and services, and library. Because these overhead costs can vary widely among organizations, senior management must assure itself that the amount submitted to the government is legitimate and reasonable.

If senior management has decided to use full-cost information for pricing and other decision making purposes, it must work with its accounting staff to select an appropriate methodology. The term "work with" is important. Because the issues are complex, the decisions cannot be completely delegated to the accountants. Full-cost information can be computed in a variety of ways, most of which can be defended as valid, but each of which can produce a different result. Moreover, the full-cost accounting effort in health care organizations is complicated by a variety of factors, such as patient or service mix, standby capacity, and alternative treatment modalities. Thus, senior management must be involved in setting the ground rules and in guiding the accounting staff's work. Otherwise, the resulting information may be of little managerial use.

Because there are no full-cost accounting rules similar to Generally Accepted Accounting Principles (GAAP) in financial accounting, we first need to discuss the conceptual structure that underlies full cost accounting. We then can turn to the cost accounting decisions that will affect the way the accounting staff gathers and presents the information.

RESOURCE USAGE: A CONCEPTUAL FRAMEWORK

The fundamental issue that cost accounting addresses is the *use of resources.* At the most basic conceptual level, these resources are the classic ones of the economist: *land, labor,* and *capital.* They are shown schematically in Figure 1.1. Take a few minutes now to review this diagram so that you can relate it to the following discussion.

Land

Land is the simplest of the three. Unlike the other two, it has no subclassifications. It can be somewhat complicated for agricultural firms or companies in the extraction industries (oil, coal, etc.), but in general—and certainly in health care—it is the site where the organization is located.

If an organization has multiple sites, as many large academic medical centers and integrated delivery systems do, the land resource might be divided between mission and support facilities. The mission facilities would be those where patients and other clients receive services; the support facilities would not be used for patient or other mission purposes (e.g., research).

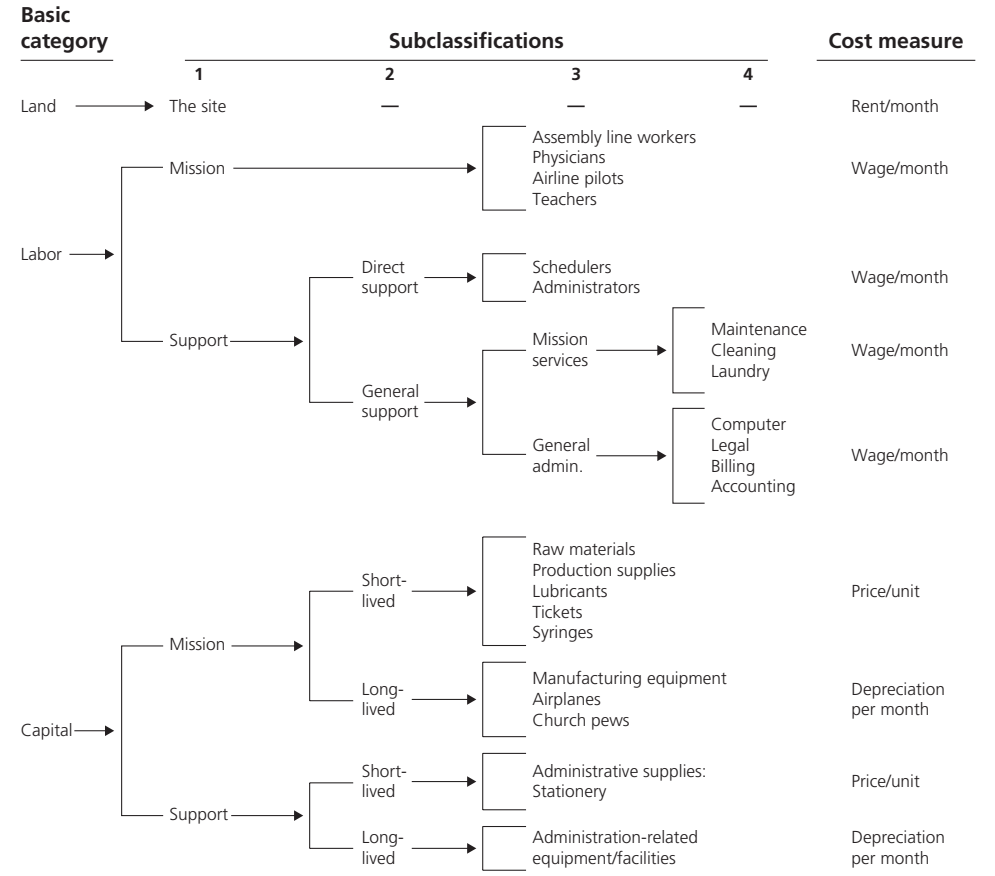

FIGURE 1.1 *Resource Usage: A Conceptual Framework*

Labor

Labor in health care and other service organizations can be classified into either *mission* (sometimes called *professional)* or *support* (sometimes called *administrative).* Mission labor consists of the individuals who actually deliver the organization's services (and thus are directly associated with the organization's main mission). Support labor includes everyone else in the organization.

Support labor can be divided into *direct* and *general.* Direct support activities include scheduling patients or providing secretarial support for a research project. General support may be related to mission services or it may be part of *general administration.* If the former, it includes centralized functions that assist the organization's mission departments but that are organized separately from them, such as maintenance or cleaning. General administration is the organization's central office staff—the people who engage in activities that typically are not related to specific professional departments. These

people are engaged in activities such as computer operations, payroll, purchasing, legal work, and billing.

Capital

Capital also can be looked at as either mission or support. The former includes all capital resources needed to provide direct support to the organization's service-delivery activities. Mission capital can be divided between *short-lived* (used up in one year or less) or *long-lived* (used up over several years).

Short-lived mission capital is sometimes called *direct* material. In health care, it includes items related to patient care, such as syringes in a physician's office, food in an inpatient ward, blood products in an operating room, floss in a dentist's office, and pharmaceuticals. Long-lived mission capital is equipment used in service-related activities.

Support capital can also be either short- or long-lived and includes items that provide general support rather than ones that are directly associated with service delivery. Supplies used in the CEO's or controller's office of a hospital are short-lived support capital, for example. Similarly, equipment such as centralized photocopying machines, fax machines, or a computing center are considered long-lived support capital.

Units of Measure

Land is rather easily measured in terms of rent per unit of area per unit of time (for example, a square foot for a month). Labor is measured by wages, either per unit of time (for example, an hour) or per unit of activity (such as a visit). Short-lived capital—either mission or support—usually is measured in terms of the factor price per unit, that is, what the organization paid to obtain the item. Long-lived capital typically is measured in terms of depreciation per unit of time.

Limitations

The conceptual framework in Figure 1.1 puts full-cost accounting into its broader economic context. Specifically, the principal objective of a full-cost accounting effort is to measure as accurately as possible the consumption of resources associated with producing a particular good or delivering a particular service. In some instances the measurement process is quite easy. An organization that produces a single product or service would have little difficulty calculating the cost of each unit. All costs associated with the organization, and hence with the product or service, could be added together and divided by the number of units produced during a particular accounting period to arrive at a cost per unit. For example, a freestanding laboratory that processed only complete blood counts (CBCs) would have a relatively easy time calculating the full cost of each CBC.

Few health care organizations produce a single product or service, however. Most provide multiple services and therefore have a more difficult time measuring resource consumption for each. Moreover, even though the categorization of costs illustrated in Figure 1.1 is a useful *conceptual* framework, its managerial utility is limited by an incomplete understanding of the factors that influence the use of resources—and hence costs. Thus, identifying these factors—sometimes called "cost drivers"—is an important activity. Doing so

allows us to bridge the gap between the broad overview in Figure 1.1 and the accountant's need to measure resource consumption in detail.

Cost Drivers

Cost drivers are organizational activities that can be linked directly to costs. Certain costs in a clinic, for example, arise as a result of the number of patient visits. Others come about as a result of the number and complexity of the programs available. Similarly, in a hospital, some costs are related to the number and complexity of patients, whereas others are a result of the available programs.

There are six cost drivers in most health care organizations. Table 1.1 describes them and gives examples for a hospital. Note that this classification scheme does not use the traditional departmental structure found in most organizations. Instead, it lists and classifies the activities that *cause* costs to exist. We will return to this idea in Chapter Nine, when we look at how an organization can use cost drivers to build a budget.

TABLE 1.1 Examples of Cost Drivers in a Hospital

Cost driver	Examples
Case type. Type of patient; sometimes called *case mix*	Myocardial infarction; pneumonia; appendicitis
Volume. The number of patients of each type	10 cases of myocardial infarction; 50 cases of pneumonia; 30 cases of appendicitis
Patient needs. The resources typically used by a patient with a particular case type	For myocardial infarction: 2 days in coronary care unit; 4 days of care in a ward; 3 days of Level III nursing care; 2 days of Level II nursing care; 12 laboratory tests; 7 X-rays
Efficiency. The number of resource "inputs" needed for each unit of output	Nursing hours per patient at each level of nursing care; time and supplies per radiological procedure; time and supplies per lab test
Factor prices. The cost per unit of each resource	Hourly nursing wage; hourly technician wage; price per unit of laboratory reagents
Program. The fixed costs incurred so that the organization is ready to serve patients	The fixed costs needed to run programs such as open-heart surgery, renal transplant, alcohol detoxification

THE COST ACCOUNTING METHODOLOGY

Let's turn now to some concrete aspects of the cost accounting methodology. As indicated earlier, an organization that produces a single good or service usually has little difficulty in calculating the cost of each unit. Let's start with such an organization and then move to a more complex one.

PROBLEM

Homecare, Inc. delivers services to homebound patients. Its services include assistance with bathing, feeding, and exercising. It calculates the cost for its services on an hourly basis. Last year the organization had total costs of $600,000 and delivered 8,000 hours of services. What is its cost per service unit? Please make your computation before reading the answer.

ANSWER

If we define a service unit as an hour, rather than as a particular activity, we can say that the organization delivers a single service—an hour of care. The full-cost accounting process, therefore, is quite simple: $600,000 ÷ 8,000 hours = $75.00 per hour of service.

In contrast, organizations that produce a variety of goods or services, each requiring different amounts of land, labor, and capital, have a more difficult time determining the cost for each unit sold. For example, the cost accounting process for Homecare, Inc. would become somewhat more complex if senior management wished to identify the costs for different program activities (bathing assistance, feeding assistance, and exercising assistance).

To address this more complex process, Homecare must make six full-cost accounting decisions: (1) defining a cost object, (2) determining mission and service cost centers, (3) distinguishing between direct and indirect costs, (4) choosing bases for allocating service center costs, (5) selecting an allocation method, and (6) deciding how to attach mission center costs to cost objects. Together these six decisions constitute the full-cost accounting methodology.

Decision 1: Defining the Cost Object

The *cost object* is the unit for which we wish to know the cost. Generally, the more specific the cost object, the more complex the accounting methodology. At one time, for example, some acute care hospitals defined their cost object as an *all-inclusive* day of care—a cost object that included surgical procedures, laboratory tests, radiology exams, pharmaceutical usage, and so on. For these hospitals, calculating their per-diem cost was as simple as calculating the per-hour cost at Homecare, Inc.

Most hospitals now use more specific cost objects. A day of care might be for "routine" activities only (such as room, dietary, and nursing costs), with separate cost objects for other activities, such as laboratory tests. Some hospitals now use a discharge or an episode of illness as the cost object, rather than a day of care. If a discharge is the cost object, the hospital would need to include all costs associated with the patient's inpatient stay (that is, for all days of care rather than just an average single day). If an episode of illness is the cost object, the hospital would include costs for *all admissions* associated with a particular illness for a given patient, plus outpatient and home care costs as well. In 1983, with the introduction of diagnosis-related group (DRG) reimbursement, Medicare effectively specified that a hospital's cost object was a discharge. Consequently, because there are several hundred different DRGs, hospitals now have several hundred different cost objects, one for each DRG.

To compute the full cost of each cost object, many hospitals have identified what they call "intermediate cost objects." These constitute the various services that a patient receives while in the hospital, or what are called "patient needs" in Table 1.1. Thus, the full cost of caring for a patient with DRG *X* would be the sum of the cost of each resource (intermediate cost object) that he or she used during the hospital stay.

Let's now return to Homecare, Inc., where, for simplicity, we used an hour of time as the cost object. This choice of cost object creates the same problem as an all-inclusive day of hospital care—namely, that there is considerable dispersion around the average. We therefore need to distinguish between *final* and *intermediate* cost objects. In this instance, the final cost object is a *visit* (such as a trip to a home to provide some care), and one of our intermediate cost objects might be an hour of time for some type of provider (such as an exercise trainer or a home health aide), with the cost of the hour depending on the salary levels of Homecare's personnel. Before we can compute the cost of these intermediate cost objects, however, we need to examine some of the other cost accounting choices.

Decision 2: Determining Mission and Support Cost Centers

Cost centers can be thought of as categories (or buckets) used to collect cost information. To best understand how they work, consider again the organization that delivers a single service. The organization could treat itself as a single cost center, thereby creating a relatively simple cost accounting system. In this case, the category used to collect cost information would be the organization itself.

Alternatively, the organization could subdivide itself into several cost centers—such as direct care delivery, administration, housekeeping, and the like—for the purposes of its cost accounting effort. When this is done, the cost of a particular cost object will be the sum of the costs attributed to it in each of the cost centers.

PROBLEM

Homecare, Inc. is considering the use of four cost centers: Housekeeping, Administration, Patient Services, and Patient Education. Cost data are available for Housekeeping salaries ($30,000) and supplies ($4,000), Administration salaries ($100,000) and supplies ($36,000),

Patient Services salaries ($175,000) and supplies ($125,000), and Patient Education salaries ($105,000) and supplies ($25,000). The agency provided 8,000 hours of service last year. What are the costs in each cost center? What is Homecare's cost per hour? You should make the computation before reading the answer.

ANSWER

Using these four cost centers, our analysis would give the same answer we found for the previous problem, but it would have a different structure, as follows:

	Cost centers				
Cost items	**Housekeeping**	**Administration**	**Patient services**	**Patient education**	**Total**
Salaries	$30,000	$100,000	$175,000	$105,000	$410,000
Supplies	4,000	36,000	125,000	25,000	190,000
TOTAL	$34,000	$136,000	$300,000	$130,000	$600,000
COST PER HOUR	$4.25	$17.00	$37.50	$16.25	$75.00

Note that the total cost per hour remains the same in both analyses. This must be the case because total costs ($600,000) and total hours (8,000) are unchanged. What value, then, derives from the extra effort associated with separating the agency into four cost centers?

There is an accounting-oriented and a management-oriented answer to this question. From an accounting perspective, costs are better understood and more easily computed if they are for relatively homogeneous groupings of activities. For this reason, the choice of cost centers ordinarily is based on homogeneity—that is, each cost center is defined so as to include a collection of very similar activities.

EXAMPLE

A photocopy center with an extremely sophisticated machine (perhaps high-speed with color capability) and an extremely simple one would most likely create a separate cost center for each machine. The sophisticated machine no doubt was more costly to purchase (and hence has higher depreciation), is more costly to

service and repair, has more costly toner cartridges, and perhaps requires a more highly skilled (and hence higher salaried) operator. Including the two machines in one cost center and calculating the average cost of a photocopy would produce a misleading cost figure. The average would overstate the cost of a copy on the simple machine and understate it on the sophisticated machine.

From a managerial perspective, separate cost centers give better information for decision making. For example, a multi-cost-center structure can be used for pricing or submitting reimbursement claims to third parties. When each program (or service) is represented by a cost center, the costs of that center can be used as the basis for setting the appropriate prices.

PROBLEM

What concerns would you have about the breakdown of Homecare's costs in the answer to the previous problem?

ANSWER

Services are provided to patients only in the Patient Services and Patient Education cost centers. Therefore the cost per hour in the Housekeeping and Administration cost centers is not an especially useful number. Moreover, the cost per hour in the Patient Services and Patient Education will depend on the number of hours of service provided in each, but we do not have this information. (We'll get it in Decision 3.)

In a multi-cost-center structure, an organization's cost centers generally are divided into two broad categories: mission centers and support centers (sometimes called service centers). *Mission centers* are associated with the organization's main focus (or mission); normally, they charge for (or are reimbursed for) their activities. In fact, some hospitals call them *revenue centers* (because they earn revenue by charging for their activities). In a manufacturing context, they sometimes are called *production centers* (because they are where the company's products are made).

Support centers accumulate the costs of the activities the organization carries out to support its mission centers. In the Homecare, Inc. example, Housekeeping and Administration would be support centers, and Patient Services and Patient Education would be mission centers. In a hospital, institution-wide depreciation, human resources, plant maintenance, laundry, and the like generally are support centers, and programs and patient service departments are mission centers.

With the above distinctions, the cost for a given cost object now depends upon (1) the mission center or centers where a patient received services, (2) the number of units of service he or she received in each, and (3) the cost for each unit of service. The cost per unit of service in each mission center depends, in part, on that center's fair share of the organization's support center costs.

Decision 3: Distinguishing Between Direct and Indirect Costs

A third decision in designing a cost accounting system is distinguishing between direct and indirect costs. *Direct costs* are unambiguously associated with, or physically traceable to, a specific cost center. *Indirect costs* apply to more than one cost center and thus must be distributed among the cost centers that use them.

Again, under the simplest of circumstances, where an organization produces one product in one cost center, there are no indirect costs, because it is not possible to have costs that apply to more than one cost center. The creation of multiple cost centers means that some costs become indirect, thereby necessitating their *distribution,* or *assignment.*

PROBLEM

The staff members in the Patient Education program are supervised by someone whose salary is contained in the Patient Services cost center. What kind of a cost is the supervisor's salary? Why? What should be done with it? Write a general answer to each question.

ANSWER

The salary is an indirect cost because it applies to activities in both the Patient Services and Patient Education cost centers. This means that it must be distributed between them.

To distribute the salary to the two centers, we might ask the supervisor to maintain careful time records. If we do this, we effectively convert the indirect cost into a direct cost, because we will have created a situation in which the cost (time) is physically traceable to each cost center. Alternatively, we might create a formula that uses, say, salary dollars or number of personnel in each cost center as the distribution mechanism.

PROBLEM

Assume that Homecare, Inc. decides to use hours of service as the distribution mechanism, and that 6,000 service hours were provided by the staff in Patient Services and 2,000 hours by the staff in Patient Education. The supervisor's salary is $60,000. How would the salary be distributed? Please make some calculations before continuing.

ANSWER

Homecare, Inc. can perform the following calculations:

Cost centers	Hours of service	Hours as %	Assigned supervisor's salary
Patient Services	6,000	75.0	$45,000
Patient Education	2,000	25.0	15,000
TOTAL	8,000	100.0	$60,000

The cost centers would then have the following total costs:

Cost centers	Cost
Housekeeping	$34,000
Administration	136,000
Patient Services	285,000 (that is, $300,000 − $15,000 for supervisor)
Patient Education	145,000 (that is, $130,000 + $15,000 for supervisor)
TOTAL	$600,000

Note that this approach has divided the supervisor's salary between the two relevant cost centers, based on a distribution formula. Of the $60,000 salary, $45,000 remains in the Patient Services cost center, and $15,000 has been transferred to the Patient Education cost center.

Decision 4: Choosing Allocation Bases for Support Center Costs

The hourly cost of Patient Services and the hourly cost of Patient Education includes more than the direct costs and distributed indirect costs of those activities. It also includes each mission center's "fair share" of the organization's support center costs. (As you might imagine, the notion of *fair* can be highly debatable in cost accounting—just as it is in other aspects of life.)

Because of the need to allocate support center costs, the fourth decision in the cost accounting methodology is the selection of *bases of allocation.* That is, we must choose a metric for each service center that measures its use by the remaining cost centers (frequently including other support centers as well as mission centers) as accurately as possible. In this regard we are seeking the *activity* that *causes* the existence of a support center's costs.

Let's begin with Housekeeping. Our goal is to find an allocation basis that measures as accurately as possible the use of the Housekeeping resource by the other cost centers.

Although several allocation bases may be available, one that seems to be quite appropriate is square feet of floor space. That is, the more floor space a cost center uses, the greater will be its share of the Housekeeping expense.

PROBLEM

Assume that the following information on square feet is available:

Cost center	Square feet
Administration	1,000
Patient Services	3,000
Patient Education	1,000
TOTAL	5,000

How much of the cost of the Housekeeping cost center will be allocated per square foot? Make your computations before continuing reading.

ANSWER

The rate is $6.80 per square foot: $34,000 of Housekeeping ÷ 5,000 square feet of floor space.

With this information, we are now prepared to allocate housekeeping costs to the three remaining cost centers. All we now need to do is multiply the rate by the number of square feet in each.

PROBLEM

How much Housekeeping should be allocated to each cost center? Write out your computations and allocation amounts, using the following headings:

Cost center	Computation	Allocation
Administration		
Patient Services		
Patient Education		
TOTAL		

ANSWER

The amount of Housekeeping allocated to each cost center would be calculated as follows:

Cost center	Square feet × rate	=	Allocation
Administration	1,000 × $6.80	=	$6,800
Patient Services	3,000 × 6.80	=	20,400
Patient Education	1,000 × 6.80	=	6,800
TOTAL	5,000		$34,000

Note that Housekeeping has been allocated to the Administration cost center as well as to the Patient Service and Patient Education cost centers—that is, in this approach, a support center's costs have been allocated to other support centers as well as to mission centers. We will examine alternative approaches later in the chapter.

Given this approach, Homecare, Inc. now must allocate the costs of the Administration cost center to the remaining cost centers. To do so, it must choose an appropriate allocation basis. There are several bases we might use, such as number of personnel, salary cost, or number of visits. Assume that salary cost is the allocation basis and that the following information is available:

	Salary costs	
Cost center	Initial	With supervisor salary assignment
Administration	$100,000	$100,000
Patient Services	175,000	160,000 (15,000 removed for supervisor)
Patient Education	105,000	120,000 (15,000 added for supervisor)
TOTAL	$380,000	$380,000

Computing the allocation rate per salary dollar for Administration is somewhat more complicated than it was for Housekeeping, because total costs in the Administration cost center have been increased by the Housekeeping allocation. When we include this allocation, the total costs in the Administration cost center are $142,800, calculated as follows:

Direct (and distributed) costs	$136,000
Housekeeping allocation	6,800
Total costs to be allocated	$142,800

Because the Administration costs are to be allocated to the remaining cost centers (Patient Services and Patient Education), and because the basis of allocation is salary dollars, we need to determine the allocation rate—that is, Administration dollars per salary dollar.

PROBLEM

Given the figures supplied, how much Administration should be allocated for each salary dollar? Please make your computations before looking at the answer.

ANSWER

The amount of Administration per salary dollar would be calculated as follows:

Total costs to be allocated	$142,800
Divided by salary dollars in cost centers receiving Administration's services	$280,000
Equals rate of Administration costs per salary dollar	$0.51

Note that we have used only the salary dollars in the two *receiving* cost centers, that is, the cost centers to which the Administration costs are to be allocated. If we were to use all salary costs—those in Administration, Patient Services, and Patient Education—we would end up with a rate that does not fully allocate the $142,800. (This idea is a little tricky. If you are having trouble with it, try doing the allocation using a rate that includes salary dollars in all cost centers.)

Determining the Allocation Rate We can use the previous example to derive a general principle for determining the allocation rate:

$$\text{Allocation rate} = \frac{\text{Total costs in the support center to be allocated}}{\text{Total allocation-basis units in the receiving cost centers}}$$

An important point to note here is that the denominator of the formula does not include the units of the allocation basis in the cost center from which the allocation is taking place. Nor does it include any units from cost centers that have already been allocated. It includes only the units in the *receiving* cost centers.

PROBLEM

Given the previous calculations, how much Administration should be allocated to each cost center? Write out your computations and allocation amounts using the following headings.

Cost center	Computation	Allocation
Patient Services		
Patient Education		
TOTAL		

ANSWER

The amount of Administration allocated to each cost center would be calculated as follows:

Cost center	Salary dollars × rate	=	Allocation
Patient Services	$160,000 × .51	=	$81,600
Patient Education	120,000 × .51	=	61,200
TOTAL	$280,000		$142,800

With this information, we now can determine the full cost of each mission center:

Cost center	Direct plus (minus) distributed costs	Housekeeping allocation	Administration allocation	Total costs
Patient Services	$285,000	$20,400	$81,600	$387,000
Patient Education	145,000	6,800	61,200	213,000
TOTAL COSTS				$600,000

Note that the total costs of $600,000 remain the same as they were prior to the allocation of support center costs, but they now reside only in mission centers. We have fully allocated the Housekeeping and Administration costs, first by allocating the Housekeeping support center costs to the Administration support center as well as to the two mission centers, and then by allocating the Administration support center's costs (with its Housekeeping allocation included) to the two mission centers.

In summary, the total costs in a given mission cost center are the sum of (1) its direct costs, (2) the indirect costs distributed to (or removed from) it, and (3) the support center costs allocated to it. In Homecare, Inc., our bases of allocation were square feet and salary dollars, but an allocation basis can be almost anything that (1) can be measured and (2) has a reasonable cause-and-effect relationship with the use of a support center's resources.

In the context of deciding on allocation bases, it should be noted that increased precision generally requires greater measurement efforts and hence higher accounting costs. Thus, the decision to use the more accurate basis depends largely on senior management's planned use of the information. In some instances the information can improve pricing decisions, and in others it will have an effect on reimbursement from third-party payers. These and similar considerations will determine whether a more accurate allocation basis should be used.

This dilemma frequently arises with the Housekeeping support center. The usual basis of allocation for Housekeeping is square feet of floor space. Computation of square footage for all cost centers is a one-time activity. After it has been completed, Housekeeping costs can be allocated quite easily. This method, although less precise than, say, hours of service, is much easier to apply because the hours-of-service method requires ongoing measurement of the number of units of the allocation basis. Obviously, however, the use of square feet can lead to over-or under-representation of the actual use of Housekeeping services by a given cost center; the hours-of-service basis presumably would not have this problem.

In general, the more precise the allocation basis, the more accurately one captures true consumption of a support center's resources. Measurement of the more precise basis can be a time-consuming and complicated process, however. Occasionally, a less accurate basis is adopted in response to time, staffing, and technical constraints.

EXAMPLE

In one study of the precision of allocation bases, the researchers found that the use of a more precise basis in only three service centers changed the cost in several mission centers by about 15 to 20 percent.[2]

Distribution versus Allocation In choosing allocation bases, it is important to keep in mind that *distribution,* discussed in Decision 3, precedes allocation and serves to place costs into both support and mission centers. Costs that are direct for a given cost center need not be distributed, whereas indirect costs (those that apply to more than one cost center) must be distributed into the relevant centers. In contrast, allocation is the process of transferring support center costs to mission centers to determine the full cost of each mission center.

This terminology can be confusing, because the terms *distribution, allocation,* and (sometimes) *apportionment* are sometimes used interchangeably. In addition, support centers are sometimes called *service* centers, and their costs are sometimes called *indirect costs* or *overhead costs.* As a result, attempting to memorize precise meanings for the various terms is not especially useful. Rather, by understanding the process that is at work, you generally will find that the context clarifies the meaning.

Decision 5: Selecting an Allocation Method

Three methods are used to allocate support center costs to mission centers: (1) *direct* (or single-stage), (2) *step-down* (or two-stage), and (3) *reciprocal.*

The Direct Method Under the direct method, support center costs are allocated to mission centers only and not to other support centers. This is the simplest method of the three and is used by many organizations. It is the least precise of the three, however, in that it does not include the cost effects associated with one support center's use of another support center.

The Step-down Method The step-down method is the one we used for Homecare, Inc. It sequentially "trickles down" support center costs into other support centers and mission centers. This "stepping-down" process begins with the first support center in the sequence and spreads its costs over the remaining support centers and the mission centers. The distribution is based on each cost center's use of the support center's resources as determined by the chosen allocation basis. This process is followed for all remaining support centers.

Because it allocates each support center's costs to other support centers as well as to mission centers, the step-down method is more complicated than the direct method, but it is also more precise in that it includes the cost effects associated with one support center's use of another. However, once a support center's costs have been allocated, it cannot receive an allocation; thus the step-down method does not include the cost effects of a given support center's use of another support center that comes later in the sequence.

The Reciprocal Method Under the reciprocal method, the most complex technique, all support centers make allocations to and receive allocations from each other, as well as make allocations to all the mission centers. The allocation amounts are determined by a set of simultaneous equations. Because all support centers can both make and receive allocations, the reciprocal method is the most accurate of the three.

An example of the reciprocal method is contained in Appendix 1.1, at the end of this chapter. As it demonstrates, even when only two support centers are used, the simultaneous equations make the method quite complex. When the number of support centers (and hence simultaneous equations) exceeds three, a human has considerable difficulty using the reciprocal method. It is relatively easy for a computer to solve the equations, however, and software packages are available to do this.

Because of its precision, the reciprocal method is preferred by the Cost Accounting Standards Board (CASB). Despite the CASB's preference, many health care organizations

find that the step-down method strikes about the right balance between accuracy and ease of use. It is the method preferred by the American Hospital Association (AHA) for hospitals, and Medicare requires hospitals to use it in order to receive reimbursement.

Choosing a Support Center Sequence When the step-down method is used, the sequence followed in allocating the support centers can affect the costs in each mission center. The sequence will not affect total costs, however, which will remain the same under all sequences (for example, $600,000 for Homecare, Inc.). Occasionally, the effect of the sequence decision on a particular mission center is significant, however. Therefore the sequence decision should be considered carefully.

In general the approach to choosing a sequence is to allocate support centers in order of their use by other support centers. That is, the support center that uses other support centers the *least* is allocated *first,* and the support center that uses other support centers the *most* is allocated *last.* Clearly, considerable judgment is required to determine this sequence.

PROBLEM

What judgment has management at Homecare, Inc. made in deciding to allocate the Housekeeping cost center before the Administration cost center? Is a similar judgment involved in choosing the sequence of mission centers? Why or why not? Write out your answers before reading the analysis that follows.

ANSWER

Management's judgment apparently is that the Housekeeping Department uses the Administration Department less than the Administration Department uses the Housekeeping Department. (That is, less effort is spent administering the Housekeeping Department than is spent cleaning the Administrative offices!) With regard to mission centers, their sequence is unimportant because there is no allocation *out of* mission centers.

An Illustration Figure 1.2 shows the same support and mission centers that were discussed in the preceding section. As in that section, the allocation process begins with the Housekeeping support center, and uses square feet as the basis for allocation. This is shown by including the term *square feet* in parentheses in the column headed "Housekeeping." As this column shows, the $34,000 in the Housekeeping support center has been allocated across the remaining support centers.

Looked at a bit differently, the total direct costs (plus distributed costs if there had been any) in Housekeeping are $34,000, which is shown in the *row* labeled "Housekeeping."

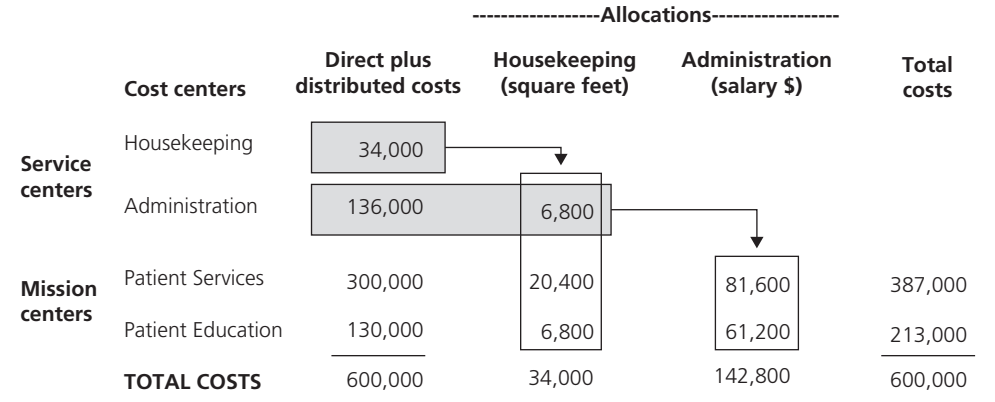

FIGURE 1.2 *The Step-down Method*

The total *allocated* costs of $34,000 are shown in the *column* labeled "Housekeeping." The row amount is shaded; the allocations are shown in the outlined box, with a total at the bottom.

With the allocation of the housekeeping costs, the Administration support center now has a total of $142,800 ($136,000 + $6,800) to be allocated—that is, its $136,000 of direct costs (plus any distributed costs) plus the $6,800 of housekeeping allocated to it. These two amounts are shown in the shaded box in the "Administration" row.

Administration costs are allocated using salary dollars, and the outlined box shows how those costs were allocated to the remaining cost centers, the two mission centers in this case. The total amount allocated ($142,800) is shown at the bottom of the column.

The total costs in the mission centers are determined by combining their direct and distributed costs and adding the costs allocated to them from the support centers. This process was discussed in the section on allocation bases. The step-down method is the formal approach to the same process.

Key Aspects of the Step-down Method There are several important points to keep in mind when allocating costs using the step-down method.

1. Only support center costs are allocated. Mission center costs are not. Mission centers receive costs from support centers, but once a cost has been allocated to a mission center, it stays there.
2. To carry out the step-down process, a basis of allocation must be chosen for each support center. The basis attempts to measure the usage of that cost center by the other cost centers—both support centers and mission centers. For example, in organizations that have a laundry (such as hospitals), the number of pounds of laundry frequently is used as the basis for allocating the costs of the laundry support center. Each cost center thus receives a portion of laundry costs, in accordance with its proportion of the total pounds of laundry processed. If a particular cost center used no pounds of laundry, it would not receive any allocation from the laundry cost center.

3. The amount of a given support center's costs allocated to a particular mission center will depend in part on whether that support center is allocated early or late in the sequence. If it is allocated late in the sequence, it will contain some costs from support centers allocated earlier in the sequence. If it is allocated early, it will not.
4. Total costs do not change. All that changes with different allocation bases and step-down sequences is the distribution of total costs among the various cost centers and, ultimately, among the mission centers.

Decision 6: Attaching Costs to Cost Objects

A final decision to be made in a full-cost accounting system concerns the way mission center costs are "attached" to cost objects. A *process system* typically is used when all units of output are roughly identical, as on a production line. All production-related costs for a given accounting period are calculated and then divided by the total number of units produced to give an average cost per unit. When hospitals used an all-inclusive per diem, they were using a process system.

A *job order system* is used when the units of output are different. An automobile repair garage is illustrative. Adding all costs for a given accounting period, such as a day, and dividing the total by the number of cars repaired to determine an average cost per repaired car would provide misleading information to management (as well as unfair prices to customers). Instead, a job order cost system uses a job ticket on which the time and parts associated with each repair effort are recorded separately and their costs are computed by means of hourly wage rates, unit prices, and so on. We will examine these choices and their impact on the cost of a cost object in considerable detail in Chapters 4 and 5.

Of the six cost accounting decisions we have discussed, the two that typically require the most judgment are the definition of a cost object and the determination of cost centers. The distinction between direct and indirect costs is largely a matter for the accounting staff. The choice of allocation bases and the selection of an allocation method require some involvement by senior management but largely with regard to the balance between the precision that a particular basis or method provides and the cost of using it.

Defining an organization's cost object requires senior management's judgment about how well a given cost object fits with management's pricing policies. In Homecare, Inc.'s case, the *final* cost object probably is a visit to a patient, because this is how most patients think about Homecare's work. However, senior management also will be interested in the cost per hour—which would be its intermediate cost object, and would likely differ among mission centers.

Consideration of the multiple-cost-center approach raises the issue of the most appropriate number and kind of cost centers. As discussed earlier, the main goal in choosing cost centers is to organize costs into homogeneous collections of activities. When this is the case in a support center, and when an appropriate allocation basis has been chosen, the portion of that support center's costs that is allocated to each remaining cost center generally is a fair measure of usage.

Similarly, when a mission center consists of a set of homogeneous activities, the same activities will take place for every cost object; the only difference will be the length

of time they take. Thus, the portion of the center's costs that is attached to a cost object depends only on the *amount of time* the cost object spent in the mission center, not on what happened to it while it was in the center.

EXAMPLE

Recall the earlier example of the photocopy center. There were two photocopying machines: a simple one and a sophisticated one. If senior management sets up each machine as a separate cost center, the cost of a job will depend on (1) the rate for the machine that is used and (2) the amount of time the machine is used. The accounting cost thus will come close to measuring the true consumption of resources.

Unfortunately, resource and time constraints sometimes make it necessary to group heterogeneous activities into one cost center. When this happens, the costs allocated from a support center to a receiving cost center or attached to a cost object using a mission center will not be solely a function of the allocation basis or the time spent in a given cost center; they also will be a function of the activities that take place in the cost center.

PROBLEM

What additional information would you like to have about the Housekeeping cost center at Homecare, Inc. to determine whether it is appropriately structured as a single cost center or whether it should be divided into two or more cost centers? Write out your answer before continuing.

ANSWER

We would like to know what sorts of activities take place in the Housekeeping cost center and whether there are different kinds of cleaning that could influence the costs allocated to Administration, Patient Services, and Patient Education. For example, we would like to know whether the Patient Services cost center requires special equipment or cleaning solvents that are not used for cleaning in Administration or Patient Education. If this is the case, Homecare might use two cost centers for Housekeeping activities: one for Special Housekeeping and one for General Housekeeping. This frequently is the case in hospitals, where cleaning, say, the operating rooms requires a much more intensive effort per square foot and more expensive cleaning supplies than cleaning the admitting area.

Determining the Impact on Customer Prices

Information structured into multiple cost centers can be extremely useful for pricing purposes. If we assume for the moment that Homecare, Inc.'s management wants a 10 percent markup over costs when pricing the agency's services, the multiple-cost-center approach will give a very different pricing structure than the single-cost-center approach.

PROBLEM

A potential patient has asked Homecare, Inc. for a bid on a weekly home visit, which the manager estimates will require 3 hours. Another potential client has asked for a bid on educating an elderly relative, which the manager estimates will require 1 hour a week. How would the prices Homecare, Inc. proposes to these potential patients and clients differ between the single-cost-center and multi-cost-center approaches?

ANSWER

The price per hour for either patient service or patient education would be the cost plus 10 percent, computed as follows:

Cost per hour	
One cost center	$600,000 ÷ 8,000 hours = $75.00
Multiple cost centers	
Patient Services	$387,000 ÷ 6,000 hours = $64.50
Patient Education	$213,000 ÷ 2,000 hours = $106.50
Price per hour	
One cost center	$75.00 + $7.50 = $82.50
Multiple cost centers	
Patient Services	$64.50 + $6.45 = $70.95
Patient Education	$106.50 + $10.65 = $117.15

Thus the cost-based prices proposed to the patient for the two jobs would be as follows:

One cost center	
Patient Services	3 hours @ $82.50 = $247.50
Patient Education	1 hour @ $82.50 = $82.50
Multiple cost centers	
Patient Services	3 hours @ $70.95 = $212.85
Patient Education	1 hour @ $117.15 = $117.15

Note that with the multiple-cost-center approach, the price per hour for Patient Services decreased by about 13 percent, and the price for Patient Education increased by about 43 percent. If we assume that the multiple-cost-center approach gives us a more homogeneous collection of activities in each cost center, then the cost on which the price is based comes closer to the true consumption of resources needed for each hour of service.

SUMMARY OF COST ACCOUNTING CHOICES

The choices involved in developing a cost accounting system can be tricky and usually involve some managerial judgment. Moreover they are highly interdependent. The choice of cost centers will influence the distinction between direct and indirect costs. The choice of a particular final cost object frequently will require the use of certain intermediate cost objects or call for certain kinds of cost centers. Allocation of support center costs will be determined in part by the choice of the support centers themselves, in part by the distribution process for indirect costs, in part by the chosen allocation bases, and in part by the allocation sequence.

In this context it is important to emphasize that any change to the cost of one cost center always will be accompanied by changes in another direction to other cost centers. That is, once costs have been incurred, they do not change. Hence total costs will always be the same on any set of cost reports prepared for the same organization for the same period. As a result the effect of any change in methodology is solely one of making shifts among cost centers. Sometimes these cost shifts can be quite significant, however.

You are now ready to work on the practice case for this chapter, Mossy Bog Laboratories, which will give you some practice in using the step-down method. Work through the case to the best of your ability before looking at the solution, which is contained in the Appendix at the end of the book.

KEY TERMS

Allocated overhead	Direct labor
Direct cost	Direct material

TO BEAR IN MIND

1. This chapter has focused on mission and support centers and the allocation of support center costs into mission centers. This way of viewing costs has some limitations. Specifically, the allocation methodology says little about a cost's actual *behavior* as the volume of activity in a cost center increases or decreases. For this reason, full-cost information is not especially useful for a category of decisions known as *alternative choice decisions.* The costs appropriate for these decisions are discussed in Chapters Two and Three.
2. In this chapter you have learned about *Stage 1* of the cost accounting effort. At the end of this stage, all costs reside in mission centers. In *Stage 2,* mission center

costs are attached to the cost objects passing through those centers. We discussed this activity briefly in terms of the choice between a process and a job-order system, but it is trickier than it might seem. It is discussed in detail in Chapters Four and Five.

NOTES

1. Young, David W., "Cost Accounting and Cost Comparisons: Methodological Issues and Their Policy and Management Implications." *Accounting Horizons*, Mar. 1988.
2. Young, D.W., E. Socholitzky, and E.W. Locke, "Ambulatory Care Costs and the Medicare Cost Report: Managerial and Public Policy Implications." *Journal of Ambulatory Care Management*, Feb. 1982.

APPENDIX 1.1: THE RECIPROCAL METHOD OF COST ALLOCATION

To see how the reciprocal allocation method works, let's use the example of an express mail delivery company with two support centers, Housekeeping and Administration. We wish to allocate the support center costs to the two mission centers: Next-Day Delivery and Two-Day Delivery. Management has decided to allocate housekeeping costs on the basis of the square footage in each department and administration costs on the basis of the number of hours worked by the employees in each department. Table A1.1 shows how the initial data for the company might look.

TABLE A1.1 Basic Information for a Reciprocal Cost Allocation (costs in thousands of dollars)

	Administration	House-keeping	Two-day delivery	Next-day delivery	Total
Area occupied (sq. ft.)	1,000		1,000	3,000	5,000
Labor hours		100	100	400	600
Mission center costs			$1,500	$4,000	$5,500
Support center costs	$1,200	$2,400			$3,600
TOTAL COSTS					$9,100

Note that there are no square feet shown for Housekeeping and no labor hours shown for the Administration cost center. Because we are using square feet as the basis of allocation for Housekeeping and labor hours as the basis of allocation for Administration, we therefore exclude these measures from the two departments. In effect we do not calculate the cost of cleaning the Housekeeping Department or administering the Administration Department. We will, however, calculate the cost of administering the Housekeeping Department and of cleaning the Administration Department.

To perform the reciprocal allocation, we must set up two equations with two unknowns; the unknowns are the amount of Administration to be allocated (which is designated as *A*) and the amount of Housekeeping to be allocated (designated as *H*). Then, because Housekeeping costs are allocated on the basis of square footage, and Administration occupies 1/5 (1,000 ÷ 5,000) of the total square footage,

$$A = \$1{,}200 + 1/5\ H$$

In effect the amount of Administration to be allocated to the other cost centers is the sum of the Administration Department's direct costs plus its share of Housekeeping costs.

Because Administration costs are allocated on the basis of hours worked and Housekeeping uses 1/6 (100 ÷ 600) of the hours,

$$H = \$2{,}400 + 1/6\ A$$

That is, the amount of Housekeeping to be allocated to the other cost centers is the sum of the Housekeeping Department's direct costs plus its share of Administration costs.

We now can substitute terms, as follows:

$$A = \$1{,}200 + 1/5\ (\$2{,}400 + 1/6\ A), \text{ or}$$
$$A = \$1{,}200 + \$480 + 1/30\ A. \text{ Therefore,}$$
$$A = \$1{,}738.$$

And, because $H = \$2{,}400 + 1/6\ A$,

$$H = \$2{,}690$$

To complete the reciprocal allocation, we remove $1,738 from Administration and allocate it to the remaining three cost centers on the basis of labor hours, and we remove

$2,690 from Housekeeping and allocate it to the three other cost centers on the basis of square footage. The result is that the support center costs are fully allocated to the other support centers and the mission centers, with the further result that total costs now reside only in the mission centers. These allocations are shown in Table A1.2.

TABLE A1.2 Allocation of Support Center Costs to Mission Centers (in thousands of dollars)

	Administration	Housekeeping	Two-day delivery	Next-day delivery	Totals
Initial costs	$1,200	$2,400	$1,500	$4,000	$9,100
Housekeeping allocation[a]	538	(2,690)	538	1,614	
Administration allocation[b]	(1,738)	290	290	1,158	
TOTAL COSTS			$2,328	$6,772	$9,100

[a]$2,690 from formula. Allocated 1/5 to Administration, 1/5 to Two-Day Delivery, and 3/5 to Next-Day Delivery.
[b]$1,738 from formula. Allocated 1/6 to Housekeeping, 1/6 to Two-Day Delivery, and 4/6 to Next-Day Delivery.

As pointed out in the chapter text, once the number of support centers exceeds three, solving the set of simultaneous equations becomes too complex for a human, although it can be done easily by a computer.

PRACTICE CASE

MOSSY BOG LABORATORIES

Mossy Bog Laboratories—an organization that contracts with hospitals to perform various kinds of laboratory tests for outpatients—has two support departments (Maintenance and Administration) and two mission departments (Sophisticated Tests and Simple Tests). The Sophisticated Test Department is highly equipment intensive, whereas the Slow Test Department is highly labor intensive. Management has decided to allocate housekeeping costs on the basis of depreciation dollars in each department, and administration costs on the basis of labor hours worked by the employees in each department.

The following data (dollar amounts in thousands) appear in the organization's records for the current period:

	Service centers		Mission centers		
	Maintenance	Administration	Sophisticated tests	Simple tests	Total costs
Direct plus distributed costs	$1,160	$2,400	$8,000	$4,000	$15,560
Depreciation dollars[a]	$200	$2,000	$3,000	$800	$6,000
Labor hours	20,000	10,000	10,000	40,000	

[a]Depreciation dollars are included in direct cost figures. For example, the $1,160,000 of costs in the Maintenance Department includes $200,000 of depreciation.

ASSIGNMENT

1. Allocate the support center costs to mission centers using the step-down method, and determine the relevant total costs. Begin with the Maintenance Department.
2. To what use would you put this information? Please be specific: what are the next steps you would take based on this information?

CASE 1.1: HARBOR CITY COMMUNITY CENTER

> Our deficit is increasing, and we obviously have to reverse that trend if we're going to become solvent. But, for that, we have to know where our costs are, in particular the cost of each of the services we offer.

In March, Liz Conaway, executive director of the Harbor City Community Center, expressed concern to Frank Simi, her new accountant, about the Center's cost accounting system. The extensive funding Harbor City had received during its early years was decreasing and Ms. Conaway wanted to prepare the center to be self sufficient, yet she lacked critical cost information.

Background

Harbor City Community Center had been established some 20 years earlier by a consortium of community groups. Situated in Torrance, an inner-city residential neighborhood

of Los Angeles, California, the center provided comprehensive services to residents of Torrance and neighboring communities. It continued to maintain strong ties with the community groups responsible for its development and subsequent acceptance in Torrance.

Funding of Harbor City was initially provided by the Federal government as part of an attempt by the Department of Health and Human Services to provide broad based community services to inner-city poverty areas in the United States. When these operating funds were depleted two years ago, the city of Torrance supplemented Harbor City's income with a small three-year grant. Because Ms. Conaway realized that foundation and government support could not continue indefinitely, she intended to make the center self-sufficient as soon as possible. Harbor City's income statement is contained in Exhibit 1.

The center contained eight client-service departments: Homemaker Service, Family Planning, Counseling, Parents' Advocacy, Mental Health, Alcohol Rehabilitation, Community Outreach, and Referral and Placement. In addition, the center had a Training and Education Department. The center had twenty-two paid employees and a volunteer staff of six to ten students acquiring clinical and managerial experience.

Community Outreach, which had been designed by Harbor City's consumers, was a multidisciplinary department providing a link between the health and social services at the center and the schools services of the community. The department was staffed by a part-time speech pathologist, a part-time learning specialist, and a full-time nutritionist.

The Referral and Placement service was for people whom the center felt, at the time it received a referral, it could not serve; the staff tried to locate another agency to serve the person. Parents' Advocacy did not serve clients directly but rather worked on behalf of clients who were having difficulty with housing, schools, and so forth.

Existing Information System

Harbor City's previous accountant had established a system to determine the cost per client-visit (or related activity such as advocacy). According to this method, shown in Exhibit 2, the cost was a yearly average for all client visits. The accountant would first determine the direct cost of each department. He would then add overhead costs (such as administration, rent, and utilities) to the total cost of all the departments to determine the community center's total costs. Finally, he would divide the total by the year's number of visits. Increased by an anticipated inflation figure for the following year, this number became the projected cost per visit for the subsequent year.

In reviewing this method with Mr. Simi, Ms. Conaway explained the problems she perceived. She said that although she realized this was not a precise method of determining cost for clients, the center's cost per visit had to be held at a reasonable level in order to keep its services accessible to as many community residents as possible. Additionally, she anticipated complications in determining the cost per visit for each of Harbor City's departments:

> You have to consider that our overhead costs, like administration and rent, have to be included in the cost per visit. That's easy to do when we have a single cost, but I'm not certain how to go about it when determining costs on a departmental basis.

Furthermore, it's important to point out that some of our departments provide services to others. Parents' Advocacy, for example. There are three social workers in that department, all earning the same salary. But one works exclusively for Counseling, and another divides her time evenly between Family Planning and Homemaker Service. Only the third spends his entire time in the Advocacy Department seeing clients who don't need other social services, although he occasionally refers clients to other social workers. In the Alcohol Rehabilitation Department, the situation is more complicated. We have two part-time MSWs, each earning $48,000 a year, and one part-time bachelor degree social worker earning $32,000. The two MSWs yearly see about 1,500 clients who need general social work counseling, but they also spend about 50 percent of their time in other departments. The BA social worker cuts pretty evenly across all departments, except Referral and Placement of course.

Mr. Simi added a further dimension:

I've spent most of my time so far trying to get a handle on allocating these overhead costs to the departments. It's not an easy job, you know. Administration, for example, seems to help everyone about equally, yet I suppose we might say more administrative time is spent in the departments where we pay more salaries. Rent, on the other hand, is pretty easy; it can be done on a square-foot basis. We could classify utilities according to usage if we had meters to measure electricity, phone usage and so forth, but because we don't, we have to do that on a square-foot basis as well. This applies to cleaning too, I guess. It seems that recordkeeping can be allocated on the basis of the number of records, and each department generates one record per client visit.

Training and Education (T&E) is the most confusing. Some departments don't use it at all, but others use it regularly. I guess the fairest would be to charge for it on an hourly basis. Since there are two people in the department, each working about 2,000 hours a year, the hourly charge would be about $16.00. But this is a bit unfair, since T&E also uses supplies, space, and administrative time. So we should include those costs in its hourly rate. Thus, the process is confusing, and I haven't really decided how to sort it out. However, I have prepared data on floor space and T&E usage. [See Exhibit 3.]

As Ms. Conaway looked toward the rest of the year, she decided she needed a precise cost figure for each department. The center was growing, and she estimated that total client volume would increase by about 10 percent during the year, spread evenly over each department. She anticipated that costs would also increase by about 10 percent. She asked Mr. Simi to prepare a step-down analysis for the prior year so that they would know Harbor City's costs for each department. She planned to use this information to assist her in projecting costs for the current year.

ASSIGNMENT

1. What is the cost per visit for each department?
2. How might this information be used by Ms. Conaway?

EXHIBIT 1 Income Statement for the Year Ended December 31

Revenue:		
Revenue from patient fees		$1,381,800
Other revenue		20,000
TOTAL REVENUE		$1,401,800
Expenses:		
Program services	$940,000	
Recordkeeping	40,000	
Training and Education	100,000	
General and Administrative	368,000	
TOTAL EXPENSES		1,448,000
Surplus (Deficit)		($46,200)

EXHIBIT 2 Costs and Patient Visits for Last Year, By Department[a]

Department	No. of visits	Salaries[b]	Others[c]	Total
Homemaker Service	5,000	$80,000	$32,000	$112,000
Family Planning	10000	20,000	60,000	80,000
Counseling	2,100	120,000	64,000	184,000
Parents' Advocacy	4,000	108,000	24,000	132,000
Mental Health	1,400	60,000	32,000	92,000
Alcohol Rehabilitation	1,500	128,000	32,000	160,000
Community Outreach	2,500	20,000	40,000	60,000
Referral and Placement	6,400	80,000	40,000	120,000
Subtotal	32,900	616,000	324,000	940,000
Administration		152,000	8,000	160,000
Rent			144,000	144,000
Utilities			40,000	40,000
Training and Education		64,000	36,000	100,000
Cleaning			24,000	24,000
Recordkeeping		28,000	12,000	40,000
Total		$860,000	$588,000	$1,448,000
Number of Client Visits				32,900
Average Cost per Visit				$44.00

[a]Client visits rounded to nearest 100; expenses rounded to nearest $1,000.
[b]Includes fringe benefits.
[c]Materials, supplies, contracted services, depreciation and other non-personnel expenses.

EXHIBIT 3 Floor Space and Training and Education Usage[a]

Department	Floor space[b]	T & E usage[c]
Homemaker Service	1,000	1,000
Family Planning	1,300	200
Counseling	1,800	2,400
Parents' Advocacy	300	100
Mental Health	1,000	---
Alcohol Rehabilitation	500	---
Community Outreach	1,100	100
Referral and Placement	1,000	200
Administration	500	---
Recordkeeping	300	---
Training and Education	1,200	---
Total	10,000	4,000

[a]Rounded to nearest 100
[b]In square feet
[c]In hours per year rounded to the nearest 100

CASE 1.2: CARROLL HOSPITAL

Prepared by David W. Young with assistance from Robert Goldszer, M.D. Financial support for its preparation was provided by the Alliance for Academic Internal Medicine, Washington D.C.

> This report doesn't describe where our costs are generated. We're applying one standard to all patients, regardless of their level of care. What incentive is there to identify and account for the costs of each type of procedure? Unless I have better cost information, all our attempts to control costs will focus on decreasing the number of days spent in the hospital. This limits our options. In fact, it's not even an appropriate response to senior management's mandate.

The speaker was Ann Julian, M.D., chief of the Department of Obstetrics and Gynecology at Carroll Hospital, a medium-sized tertiary care facility. After reviewing the most recent cost report for her department, Dr. Julian had some serious concerns, and was meeting with Jonathan Haskell, the director of Fiscal Affairs, whose department had generated the report. Dr. Julian continued:

> Not only that, but over half the costs are not even within my control. How am I supposed to exert any influence over Dietary or Housekeeping, for example? I also know from experience that the cost figure the hospital is using for a simple lab test, such as a CBC,

is exorbitant. And it's likely that some of the other clinical services shown on my report are too expensive as well. But I can't do anything about it!

Background

Two years ago, in an effort to control rising hospital costs, Carroll's senior management had instituted spending limits and had made each department responsible for keeping its total costs at or below the limit determined during annual budget negotiations. Ob-Gyn, like many other departments, had felt the pinch.

Some years earlier, Carroll had established a departmental cost accounting system, and now, with the support of its medical staff leadership, Carroll required each service chief to become involved in the hospital's budgeting process and to take responsibility for the costs associated with the care of patients in his or her department. By involving service chiefs in the budgeting and control process, Carroll's senior management hoped to gain more control over its costs and to improve the hospital's overall financial performance.

The Cost Accounting System

Carroll's cost accounting system was based on three costing units: a *bed/day* for inpatient care, a *visit* for outpatient care, and a *procedure* (or *operation)* for operating rooms. Each department was required to compute its unit costs, such as a cost per bed/day for inpatient care, and report them to senior management monthly. Senior management planned to use the information for cost comparisons, and it expected that each chief would make cross-*department* comparisons as part of its cost-control efforts.

Under Mr. Haskell's leadership, Carroll had begun to use standard costing units for its clinical care departments (such as Ob-Gyn), and it had begun to use similar units for its clinical service departments, such as Radiology, Laboratory, and the Pharmacy. In Radiology, for example, the unit was a procedure, and Mr. Haskell's staff computed an average cost per procedure each month. The monthly Radiology costs for each clinical care department then were computed by multiplying this average by the number of procedures its physicians had ordered that month. The same was true in the Laboratory, where the unit was a test, and in the Pharmacy, where it was a filled prescription.

To calculate the cost per bed/day for a clinical care department, the Fiscal Affairs staff first computed that department's direct costs. Then, using the above methodology, it added the costs of the tests, procedures, and prescriptions the department's physicians had ordered from the clinical service departments. It called these *purchased clinical services.* Finally, it allocated the hospital service center costs, such as Dietary, Laundry, and Housekeeping, to the department, using allocation bases (such as space, meals, and hours of service) that had been specified by the hospital's accounting department. The result for Dr. Julian's department is shown in Exhibit 1. Exhibit 1 also shows the units used for the clinical service departments, and the bases used for allocating service center costs.

After fiscal affairs had determined a clinical care department's direct costs, added the costs, for clinical services, and allocated the service center costs, it calculated the average cost per unit by dividing the department's total costs by its number of bed/days.

The average for inpatient surgery-gynecology is shown at the bottom of Exhibit 1. Exhibit 2 shows the average cost per unit for several other surgical specialty departments.

After reviewing his department's cost report, Dr. Julian felt that the obstetrics service was fairly well defined in terms of its costs. By contrast, surgical gynecology presented a problem. She commented:

> Gynecological procedures are less amenable to assignment into cost categories. This is mainly because of the age range and diversity of the patients, but it's also due to the distinctions among the surgical subspecialties in gynecology. Because of this, the present cost accounting system is of little use for gynecology cases. This is extremely frustrating, especially since the hospital is expecting me to use this information to manage the department's costs. The average figure simply does not account for the real use of clinical resources by gynecology patients.

Mr. Haskell disagreed:

> Dr. Julian just doesn't understand. This system is ideal for comparative purposes. It allows me to quickly compare the costs among different departments within the hospital. It also helps me to compare the cost of a particular department at Carroll with a similar department at another hospital. Additionally, I can use the information to estimate the cost of treating an entire illness at Carroll. For example, with this system, I can easily determine the approximate cost of treating a patient having a total abdominal hysterectomy [TAH] and compare it to other hospitals.

According to Mr. Haskell's figures, the cost of a non-oncology TAH (a procedure in which the uterus, fallopian tubes, and ovaries are removed; if it is done for reasons other than cancer, it is classified as a *non-oncology* procedure), which usually required four days in the hospital) was \$3,708 (\$927 $\times$ 4). To this would be added the cost of a major operation with general anesthesia, or \$1,197. (The procedure might instead be performed with epidural or spinal anesthesia at the discretion of the attending physician and the anesthesia staff, in which case the total cost of the procedure would be slightly less.)

The inpatient operating room costs were based on a two-year study, and the figures were updated regularly by the fiscal affairs department. At present, Dr. Julian was not held accountable for these costs nor for the costs of anesthesia management. She was responsible only for the costs associated with the pre-and postoperative care of the patients in his department. These costs were the ones causing her difficulty. She continued:

> Some patients, especially those undergoing treatment for cancer, use more resources than others. This is mainly because the testing and therapeutic treatment of patients varies widely. Some patients require more or fewer diagnostic and therapeutic interventions, depending on their admitting diagnoses. For example, radiation therapy is used almost exclusively by oncology patients.
>
> Somehow, a good cost accounting system needs to recognize these differences. I also don't want my department to appear overly costly simply because some patients don't conform to the norm. The current cost accounting system just doesn't account for

the differences among patients. As a result, it doesn't give me the data I need to manage costs, and it includes a variety of items that I can't control.

The Use of Clinical Distinctions

After some discussion, Dr. Julian convinced Mr. Haskell that the average unit cost calculation could be revised to account for the differences among patients having different gynecology procedures. In an effort to address these clinical differences, the two decided that gynecology patients could be divided into three categories according to clinical subspecialty:

1. General Gynecology/Urogynecology (non-oncology)
2. Reproductive/In Vitro Fertilization (IVF)
3. Oncology

With the help of Dr. Julian, Mr. Haskell calculated time and material estimates for each type of patient stay. For example, he estimated that, in general, more medication was used on Oncology patients than on General Gynecology patients. Also, Oncology patients were likely to need more of a variety of other resources, such as lab tests, drugs, and X-rays.

Mr. Haskell conferred with his staff about the best method to apportion the department's costs among the three subspecialties. After much discussion, they decided to apportion most of them according to the number of patient days per subspecialty. They made some adjustments, however, to reflect unusual circumstances. The results are shown in Exhibit 3.

Dr. Julian and Mr. Haskell performed some calculations and compared the differences between the two systems. They first computed the cost of a non-oncology TAH using each system. Dr. Julian noted that the procedure generally took place in the General Gynecology category. They then compared the costs of patients undergoing two other procedures. One was a tuboplasty, a procedure in which the fallopian tube is opened or its lumen (passage) is reestablished. The other was a TAH with lymph node dissection. In this operation, the lymph nodes in the pelvic region are excised. The tuboplasty would take place in the Reproductive-IVF category, and the TAH with lymph node dissection ordinarily would be classified in the Oncology category.

Although this new system maintained bed/days as the costing unit, Mr. Haskell concluded that it was more accurate than the current one because there were now three average costs per bed/day: one for General Gynecology/Urogynecology, another for Reproductive-IVF, and a third for Oncology. Dr. Julian and Mr. Haskell concluded that this specialty-based system could greatly increase Dr. Julian's ability to control costs.

Intensities of Care

After Dr. Julian had compared a few more specialty-based costs of care, she continued to harbor some concerns about the new system. Although it was an improvement over the average bed/day calculation, it still had problems. She was particularly disturbed about the intensities of medical and nursing attention given to patients within each subspecialty.

She explained to Mr. Haskell that, for example, a TAH patient with cancer required more nursing and medical care on the second postoperative day than did a patient receiving laparoscopy, even if both patients were classified in the Oncology category.

The new system did not address these differences. In fact, the system made it appear as if all Oncology patients received the same amount of care on a given day in the hospital. From a clinical perspective, this clearly was not the case. Because of this, Dr. Julian felt that the subspecialty breakdown was still not a sufficiently accurate measure of the costs of care rendered to different patients. Working on her own, she developed a third cost accounting method based on levels of care delivered by the nursing and medical teams. In developing this new method, she divided the department's costs into three categories that were quite different from the ones used by Mr. Haskell:

1. Daily patient maintenance
2. Medical treatment
3. Nursing care

Dr. Julian decided that medical treatment could be measured with an index of non-nursing clinical intensity. She worked with two other physicians in the department to determine the amount of Laboratory, Diagnostic Radiology, Therapeutic Radiology, and Pharmacy resources that would be used by a typical patient with a TAH (non-oncology), a TAH (oncology), and a tuboplasty. She then translated these resources into units that could be counted and totaled easily.

Dr. Julian knew that this type of information was not completely accurate. For example, a TAH (non-oncology) patient in relatively good health would need fewer tests and drugs than a somewhat older patient or a patient with complications. This could result in higher or lower medical intensity, even though the number of medical treatment units in the system would be the same for all patients with the same procedure. Despite these problems, she felt that she now had a way to measure medical resource use fairly accurately.

Levels of nursing care proved to be similarly complicated. Dr. Julian consulted with nurses on the Gynecology floor and, with them, developed a system to measure patient care needs. They defined three basic levels of nursing care, which are described in Exhibit 4. A patient could change levels during her stay, and, within each level, a patient could be assigned a range of units, depending upon the intensity of nursing services being provided.

In this third method, Dr. Julian expected to use not only bed/days as a costing unit, but also, the average number of medical treatment units and nursing units per procedure. She enlisted Mr. Haskell's assistance in devising a means to divide costs among the categories in his new system. The resulting cost breakdown is shown in Exhibit 5.

Comparison of Costs

To compare his new system with the others, Dr. Julian again calculated costs for the same three procedures. According to his calculations, each required the following:

Procedure	Bed days	Medical treatment units	Nursing units
TAH (non-oncology)	4	10	10
Tuboplasty	3	7	5
TAH (oncology)	7	20	38

Dr. Julian was satisfied with the results of this cost accounting system. She thought it accurately distinguished among the surgical procedures in the gynecologic subspecialties, and that the differences in costs reflected the actual differences in resources used by patients. She commented:

> With this new information, I can identify cost problems easily since all costs are now categorized according to the nature as well as the intensity of the services. I plan to develop this system even further so that standard unit requirements for each type of procedure become well known by the physicians in my department. Then I'll be able to analyze gynecology costs according to the patient mix being treated and in terms of the services being provided or ordered by different physicians.

Mr. Haskell agreed with Dr. Julian that this third system might work well in Gynecology and in other departments having surgical subspecialties. However, he doubted that it could be transferred to all departments within the hospital. He felt that some departments would not be able to develop standard medical and nursing requirements since their patient diagnoses and procedures were not as well defined as those in surgery. Furthermore, he was concerned about the complexity of the system, especially for department chiefs. Chiefs, in his view, might not have the inclination or ability to use the system effectively or might not feel it worth the time to collect all of the necessary information.

Dr. Julian disagreed. She contacted the vice president of Medical Affairs and offered to present her system at the next meeting of chiefs of service. She was convinced that the chiefs would see its value.

ASSIGNMENT

1. Focusing on only the inpatient care cost (i.e., ignoring operating room costs), what is the cost of a TAH (non-oncology) under each of the cost accounting systems? A tuboplasty? A TAH (oncology)? What accounts for the differences?
2. Which of the three systems is the best? Why?
3. From a managerial perspective, of what use is the information in the second and third systems? How, if at all, would this additional information improve Dr. Julian's ability to control costs? How might it help chiefs in nonsurgical specialties?
4. What should Dr. Julian do next?

EXHIBIT 1 Cost Center Report for Inpatient Surgery: Department of Gynecology

Direct costs				
Wages:	Physician services		1,881,160	
	Nursing service		1,301,170	
	Clinical support staff		902,790	
	Administrative staff		132,605	4,217,725
Supplies:	Medical supplies		670,050	
	Administrative supplies		205,150	875,200
Capital equipment:	Depreciation on major purchases		174,000	
	Minor purchases		34,000	208,000
		Total direct costs		5,300,925
Purchased clinical services		**Costing unit**		
	Diagnostic imaging	Procedure	687,361	
	Laboratory tests	Test	923,986	
	Radiotherapy	Procedure	279,486	
	Pharmaceutical	Prescription	2,518,643	4,409,476
Allocated service center costs		**Allocation basis**		
Patient services:	Dietary	Meal	626,430	
	Laundry	Kilogram	169,575	
	Housekeeping	Square meter	154,260	
	Medical records	Record	127,720	
	Social Service	Hour of service	120,897	1,198,882
General services:	Operation of plant	Square foot	236,450	
	Plant depreciation	Square foot	382,680	
	Employee benefits	Salaries	469,950	
	Administration	No. employees	1,000,300	
	Insurance	Square foot	541,000	2,630,380
		Total purchased and allocated costs		8,238,738
		Total costs		**13,539,663**
		Average cost per day		**927**

EXHIBIT 2 Cost Summary for Surgical Specialties and Anesthesia

Inpatient cost by specialty	Costing unit	Total cost	Average/Unit
General	bed/day	11,871,305	797
Orthopedic	bed/day	12,274,636	938
Neurosurgery	bed/day	15,837,594	1,106
Gynecology	bed/day	13,539,663	927
Obstetrics	bed/day	9,483,625	819
Pediatrics	bed/day	11,847,364	882
Total Inpatient		74,854,187	
Anesthesia in inpatient operating rooms		13,789,475	
Major/General	procedure		1,197
Major/Epidural or Spinal	procedure		1,163
Major/Local or Regional	procedure		760
Minor/General	procedure		589
Minor/Epidural or Spinal	procedure		485
Minor/Local or Regional	procedure		274
Anesthesia in emergency operating rooms		4,842,631	
Minor/General anesthesia	procedure		486
Minor/Local or Regional	procedure		388
Minor/No anesthesia	procedure		178
Total Cost		93,486,293	

EXHIBIT 3 Cost Breakdown by Surgical Specialty: Department of Gynecology

		General gynecology	Reproductive/ IVF	Oncology	Total
Direct costs					
Wages:	Physician services	564,348	564,348	752,464	1,881,160
	Nursing services	455,410	260,234	585,527	1,301,170
	Clinical support staff	306,949	243,753	352,088	902,790
	Administrative staff	42,434	37,129	53,042	132,605
Supplies:	Medical supplies	134,010	201,015	335,025	670,050
	Administrative supplies	67,700	67,700	69,751	205,150
Capital equipment:	Depreciation on major purchases	34,800	87,000	52,200	174,000
	Minor purchases	5,100	15,300	13,600	34,000
	Total direct costs	1,610,751	1,476,479	2,213,697	5,300,925
Purchased clinical services					
	Diagnostic imaging	229,564	153,838	303,959	687,361
	Laboratory tests	295,384	241,745	386,857	923,986
	Radiotherapy	0	0	279,486	279,486
	Pharmaceutical	650,422	595,277	1,272,944	2,518,643
	Total purchased clinical services	1,175,370	990,860	2,243,246	4,409,476
Allocated service center costs					
Patient Services:	Dietary	180,480	136,490	309,460	626,430
	Laundry	57,495	45,535	66,545	169,575
	Housekeeping	49,090	43,030	62,140	154,260
	Medical records	30,930	31,850	64,940	127,720
	Social services	32,567	28,465	59,865	120,897
	Total patient services allocations	350,562	285,370	562,950	1,198,882
General services:	Operation of plant	79,160	59,155	98,135	236,450
	Plant depreciation	102,230	113,370	167,080	382,680
	Employee benefits	141,550	153,280	175,120	469,950
	Administration	200,060	390,117	410,123	1,000,300
	Insurance	195,771	187,243	157,986	541,000
	Total general services allocations	718,771	903,165	1,008,444	2,630,380
Total direct, purchased, and allocated		3,855,454	3,655,874	6,028,337	13,539,663
	Number of bed/days	4,002	5,023	5,577	14,602
	Cost per bed/day	**963**	**728**	**1,081**	**927**

EXHIBIT 4 Levels of Nursing Care

Level 1	**Basic assistance (mainly for ambulatory patients)**	**1–3 units**
	Feeds self without supervision or with family member.	
	Toilets independently.	
	Vital signs routine—daily temperature, pulse and respiration.	
	Bedside humidifier or blow bottle.	
	Routine post-operation suction standby.	
	Bathes self, bed straightened with minimal or no supervision.	
	Exercises with assistance, once in 8 hours.	
	Treatments once or twice in 8 hours.	
Level 2	**Periodic assistance**	**4–7 units**
	Feeds self with staff supervision; I&O; or tubal feeding by patient.	
	Toilets with supervision or specimen collection, or uses bedpan. Hemovac output.	
	Vital signs monitored; every 2 to 4 hours.	
	Mist or humidified air when sleeping, or cough and deep breathe every 2 hours.	
	Nasopharyngeal or oral suction prn.	
	Bathed and dressed by personnel or partial bath given; daily change of linen.	
	Up in chair with assistance twice in 8 hours or walking with assistance.	
	Treatments 3 or 4 times in 8 hours.	
Level 3	**Continual nursing care**	**8–10 units**
	Total feeding by personnel or continuous IV or blood transfusions or instructing the patient. Tube feeding by personnel every 3 hours or less.	
	Up to toilet with standby supervision or output measurement every hour. Initial hemovac setup.	
	Vital signs and observation every hour or vital signs monitored plus neuro check.	
	Blood pressure, pulse, respiration and neuro check every 30 minutes.	
	Continuous oxygen, trach mist or cough and deep breathe every hour. IPPB with supervision every 4 hours.	
	Tracheostomy suction every 2 hours or less.	
	Bathed and dressed by personnel, special skin care, occupied bed.	
	Bed rest with assistance in turning every 2 hours or less, or walking with assistance of two persons twice in 8 hours.	
	Treatments more than every 2 hours.	

Adapted from Poland, M., et al., "PETO—A System for Assisting and Meeting Patient Care Needs," *American Journal of Nursing,* July 1970, 70:1479.

EXHIBIT 5 Level of Care System: Department of Gynecology

		Daily patient maintenance	Medical treatment	Nursing care	Total
Direct costs					
Wages:	Physician services		$1,881,160		$1,881,160
	Nursing services			$1,301,170	1,301,170
	Clinical support staff	$17,345	429,756	455,689	902,790
	Administrative staff	132,605			132,605
Supplies:	Medical supplies	229,310	328,140	112,600	670,050
	Administrative supplies	205,150			205,150
Capital Equipment:	Minor purchases	6,748	17,928	9,324	34,000
	Depreciation on major purchases	35,276	138,724		174,000
	Total direct costs	$626,434	$2,795,708	$1,878,783	$5,300,925
Purchased clinical services					
	Diagnostic imaging		687,361		687,361
	Laboratory tests		923,986		923,986
	Radiotherapy		279,486		279,486
	Pharmaceutical		2,518,643		2,518,643
	Total purchased clinical services		$4,409,476		$4,409,476
Allocated service center costs					
Patient services:	Dietary	626,430			626,430
	Laundry	169,575			169,575
	Housekeeping	154,260			154,260
	Medical records	127,720			127,720
	Social services	72,100	18,747	30,050	120,897
	Total patient services allocations	$1,150,085	$18,747	$30,050	$1,198,882
General services:	Plant depreciation	382,680			382,680
	Operation of plant	236,450			236,450
	Employee benefits	88,860	255,840	125,250	469,950
	Administration	1,000,300			1,000,300
	Insurance	465,000	12,585	63,415	541,000
	Total general services allocations	$2,173,290	$268,425	$188,665	$2,630,380
Total direct, purchased, and allocated		**$3,949,809**	**$7,492,356**	**$2,097,498**	**$13,539,663**
	Total days care	14,602			
	Cost per bed/day	**$270**			
	Total medical treatment units		36,180		
	Cost per medical treatment unit		**$207**		
	Total nursing units			49,754	
	Cost per nursing unit			**$42**	

CASE 1.3: ATHERTON MEDICAL EDUCATION PROGRAMS

Prepared by Sheila M. McCarthy and David W. Young, with support from the Alliance for Academic Internal Medicine.

> One of the major issues that we face going forward is how to be true to our core educational mission and at the same time meet the needs of Bennington Hospital, the Southwestern Healthcare Network, and the broader Atherton community. This is becoming increasingly difficult with the rising number of indigent patients, our relatively recent integration into the Southwestern Network, and the constant struggle we face as a community-based program to recruit and maintain faculty. We also need to continue to enhance the partnership between Bennington and AMEP and to design systems that satisfy all the stakeholders involved.

Mary W. Bethridge, M.D., residency program director for Internal Medicine at Bennington Hospital, was discussing some of the issues that faced her program and the Atherton Medical Education Programs (AMEP), of which her program was a part. She continued:

> One of the issues that we continue to analyze is how to distribute the various revenue streams that come into the network in a way that is fair to all parties. Between our unique relationship with the City of Atherton and the evolving relationship between Bennington and ourselves, there is some confusion about the intent of some of the revenue that comes in and, just as important, some disagreements around who should bear the costs of the various activities that the money is meant to cover. Right now, we have a negative bottom line, but it may appear worse than it actually is. For example, we have a lot of costs in our budget related to indigent care. This is problematic because it makes it seem like education is very expensive, when in fact it may have more to do with the indigent care we provide. As a program director, I worry about this and the impact it might have on my program. I know that I have to have a really good understanding of the costs of my program as well as of the benefits that it brings to Bennington and to the Southwestern Network.

Henry Byron, M.D., medical director of AMEP, echoed Dr. Bethridge's concerns.

> I have been focusing a lot of my efforts on the business aspects of AMEP. Obviously, we are always concerned with the quality of the educational program; that is a given. As far as things beyond that, our situation is a little unusual because we have only been a part of the Southwestern Network for a relatively short time, and because of that we are still in the stage of getting acquainted with one another. We need to improve the financials but also continue the educational mission. Everyone is challenged financially in undergraduate and graduate education. We need to have our financial ducks in a row, so to speak, so we can convince Southwestern that we add value to them and that they are getting their money's worth.
>
> A complication is that the education and the patient care are so inextricably linked that I find it difficult and somewhat artificial to separate the two. Nevertheless, one of the things we have been trying to do is to separate the cost of education from the cost

> of patient care. We assume that we have to first cover the cost of our teaching program. We get money from various sources, and if you were to take all the monies that flow to us simply because we have a residency program, we are pretty much financially neutral. On the books, Southwestern subsidizes us, but they don't give us all the IME [Indirect Medical Education] money from Medicare; that goes to the hospital. If you were to say that instead of subsidizing us, they simply gave us the IME money, then I would say we are financially neutral.

Drs. Byron and Bethridge knew that in the upcoming months some key decisions were going to be made regarding how funds were allocated between Bennington and AMEP, and more broadly, there would be strategic discussions about AMEP's role in the Southwestern Healthcare Network. Given the importance of these issues, they saw an opportunity to present their own vision of AMEP and the most appropriate financial model. They realized that this would not be an easy task and that there would be others who might have different views. Dr. Bethridge had decided to take the lead in analyzing some of these issues as they related to the Internal Medicine Residency Program.

Background

Atherton Medical Education Programs (AMEP) was a community-based organization that operated fully accredited medical resident training programs. Its programs included Family Practice, Internal Medicine, OB/GYN, and Pediatrics. In addition, it offered integrated programs in surgery and OB/GYN in conjunction with St. Mary's Hospital in a nearby city. It also offered a transitional year program and electives for fourth-year medical school students.

AMEP's primary goal was for each of its programs to "develop educational excellence and innovation to enhance the residency training in a community setting." A related goal was that each program would "provide excellent, faculty-supervised patient care at Bennington Hospital, Atherton-Taylor County Health Department Clinics, St. David's Hospital, Blackstone Family Practice Academic Associates, and numerous private settings, that provided primary care and specialty experiences for resident education."

AMEP had the following specific objectives:

- Training competent, compassionate physicians through its primary care graduate medical education programs, transitional residency, and affiliated programs in surgery and in obstetrics and gynecology.
- Improving health care delivery in the greater metro area by participating as the providers of the safety net of care and, in so doing, delivering only the highest-quality medical care to the indigent population of Atherton and of Taylor County.
- Developing undergraduate clerkships to enhance clinical training of state university medical students at both the junior and senior levels.
- Acting as the administrative and developmental body for regional programs in continuing medical education and research, with research concentrating on each residency program's requirements in the areas of clinical medicine, health care delivery, quality assurance, and education.

AMEP was established in 1972 by the Taylor County Medical Society and had a long tradition of collaborating with Bennington Hospital, which sponsored and served as the primary site for AMEP's residency programs. In addition to its teaching and clinical care, AMEP conducted a limited amount of research related to its residency requirements.

Bennington Hospital Bennington was an acute care hospital and outpatient facility that served as the area's only trauma center as well as the safety net hospital for the medically indigent of Taylor County. Until 1995, it was run by the City of Atherton.

In October 1995, Southwestern Healthcare Network took over management of Bennington through a twenty-five-year lease agreement with the City of Atherton. Under the terms of the agreement, Southwestern would pay $2.2 million annually to lease the hospital from the city. The city would continue to provide reimbursement for indigent patients who received care at Bennington, including the uninsured and those enrolled in the city's Health Assistance Program. At the time of the lease this reimbursement totaled $11 million annually, with some $5.6 million dedicated to physician services for the indigent.

Southwestern Healthcare Network The Southwestern Healthcare Network (Southwestern), a nonprofit organization, was a member of a larger health care network that spanned sixteen states and had more than 87,000 employees. As the leading health care service provider in Taylor County, Southwestern had approximately 766,000 outpatient visits and close to 50,000 admissions annually. As Exhibit 1 indicates, it also contributed more than $84 million in charity care and community benefits in 2000. In that same year, its facilities and programs served more than 203,000 people through charity care and community benefit activities.

Hazel Patterson, Ph.D., Southwestern's acting CEO, commented on the importance of Southwestern's community service mission:

> As an organization, Southwestern is fully committed to caring for the uninsured and indigent of this community. We see ourselves taking a leadership role in setting up systems that allow us and other providers to better meet the needs of this population. Obviously, the need has increased since the time we entered the lease with the city. Nevertheless, caring for the poor and uninsured is a core part of our mission.

AMEP-Bennington Relationship

AMEP and Bennington had a long history of collaboration around graduate medical education (GME) and care for the indigent. When Southwestern first took over the management of Bennington, it contracted with AMEP for physician services for the indigent. Dr. Patterson explained the rationale:

> Clearly, we entered into our current relationship with AMEP because of the lease with Bennington and because the physicians who serve the uninsured in our community are primarily the physicians of AMEP. Having said that, I don't think that there's any doubt here that AMEP exists with a mission that is primarily dedicated to graduate medical education and, secondarily, to indigent care. One of the worrisome things is that because of a lack of a reasonable public policy regarding care for the uninsured, we haven't

grappled with the issue that the demand for care by the uninsured in this community is greater than AMEP can provide.

AMEP's Financial Condition A related issue was the pressure to improve the financial condition of AMEP. Lyndon Jones, M.D., senior vice president for Medical Affairs at Southwestern, was responsible for Southwestern's relationship with AMEP. He commented:

> We want to be better partners with AMEP. Southwestern is very supportive of GME and our goal is to support the education program. There is tension at times to balance their primary goal of education with the primary function of the Southwestern Network—service.
>
> Traditionally, AMEP put together a budget and the city funded it, but this approach led to increasing deficits. Right now, Southwestern provides about $7 million in direct support to AMEP. In addition, there is a budgeted deficit of about $1.4 million. However, we are proposing a change to the funding streams. We would pass through directly to AMEP the money from the city, the DME [direct medical education] money from Medicare that Bennington receives as well as some portion of the IME [indirect medical education] money that Bennington receives from Medicare. We are still studying how this should be split.

Maureen Sullivan, administrator of Bennington Hospital, was responsible for the hospital's financial performance and also worked closely with AMEP. Although she was supportive of graduate medical education, and recognized the benefits that the educational programs brought to Bennington, she wanted to be sure that any changes that Southwestern might make to the financial relationship between AMEP and Bennington were fair. She shared her perspective on the AMEP-Bennington relationship:

> In conjunction with the lease, Southwestern negotiated to receive the funds that the city spent for physicians' services to the indigent at Bennington. We wanted to contract directly with physicians for those services. Since that time the city has given us about $5.6 million per year for indigent care physician coverage. This money was meant for indigent care. To the extent that the physicians were using a teaching model to provide this care, the $5.6 million supported teaching, but its primary goal was to fund the physician services related to indigent care at Bennington, not GME. This was enhanced each year by Bennington to a total of $7 million.
>
> For AMEP's faculty, education is the most important part, but we don't know whether the teaching model is always the most cost-effective model. There are other hospitals where they've found that the GME model is more expensive in some specialties, and there are situations where you could demonstrate that the GME model is less expensive. It all depends on the specialty, patient needs, [and] residency requirements, and on how well the program is organized.
>
> We recently compared ourselves to another Southwestern Network hospital with about the same case mix, and we have shorter lengths of stay, which I think is because of the residency program. On the other hand, there are additional costs we incur because of the residency program. For example, the ratio of ancillary tests, such as lab and X-ray, to inpatient revenue is higher than at nonteaching hospitals; this equates to about $4.2

million annually. To Bennington that is an extra cost, even though the faculty regularly challenge residents on their use of tests. In addition, there's the additional space needed to support the GME program, such as offices, sleeping rooms, conference rooms, food costs, and other things like extra scrubs and linens.

Despite these costs, the linkages between AMEP and Bennington are critical to our hospital. I can show the positive impact of GME on our quality indicators compared to other hospitals. So I think that GME improves the quality of care. For example, we have twenty-four-hour, in-house physician coverage for obstetrics because of the requirements to back up the residents. Also, if you look at any of the obstetrical quality indicators (C-sections, delivery rates, and the like), the clinical outcomes for the type of high-risk patients that we have are very good. Our outcomes are also very good for internal medicine. In general, I think having residents keeps all physicians up to date. Finally, AMEP is also committed to the population we serve, they really care about the indigent, and that is directly in line with the mission of this organization.

In addition, having residency programs means Bennington will receive a higher Medicare reimbursement rate. We also have access to the "disproportionate share" dollars through the state.

Financial Benefits of GME A Southwestern financial manager expanded on the financial benefits of GME:

The hospital receives about $600,000 in DME funding from Medicare. This money covers the residents' salaries and benefits and is based on costs related to the 1984 cost report trended upward for inflation. We receive $48,800 per primary care resident and $46,000 for all other residents up to a cap of eighty-one residents. The IME that we receive from Medicare is about $2 million. There is a somewhat complicated formula we use that ends up giving us 15.7 percent more per Medicare discharge than we would have received without residents. The BBA [The Balanced Budget Amendment of 1997] will bring this down to about 13.4 percent when it is fully phased in. In addition, there is graduate medical education money from Medicaid, which can range from approximately $500,000 to $800,000. The estimate for this year is $800,000, although this figure has not yet been audited. Of course the residency program has costs of about $8.4 million as reported on the Medicare cost report. This includes direct as well as indirect, or allocated, expenses.

Exhibit 2 presents a cost report showing Bennington's direct and indirect GME expenses. The immediate concern to Ms. Sullivan was how the resulting revenue should be distributed. She wanted to be sure that the distribution was fair and reflected the costs that each unit incurred. She explained the way it currently worked:

The City of Atherton originally provided $5.6 million to AMEP, which now comes to the hospital for indigent care. When we contracted with AMEP, Bennington added another $1.4 million for the cost of providing indigent care. Some people think that this money is part of the GME dollar, but after talking with some involved in the negotiations, we learned differently. At the time, it was decided that the GME would remain with the hospital, but the hospital agreed to pay AMEP $7 million. In addition to the revenue

> AMEP receives from Southwestern related to indigent care and GME, AMEP also gets the billings and collections for all the patients they see at Bennington. We are about 23 percent self-pay [patients], and approximately 75 percent are billable, which includes Medicaid. In addition, AMEP received another grant from the network to balance its budget. Again, that is right off the top, because the network services unit has no revenue sources.
>
> I believe we should have a formal contract to clearly identify and value what Bennington provides and to identify the value of what AMEP provides in this partnership. We look at AMEP as a very valuable partner—they need to know what we are providing them and we need to acknowledge what they are providing us. I look forward to continuing our current relationship with AMEP, and I will continue to challenge them to work with us to improve our quality of patient care and be more cost effective.

A complication in understanding the revenue and expenses was the difficulty in identifying which costs were related to care for the indigent and the hospital's needs and which were related to education. Indeed, that was one of the major issues that Dr. Bethridge hoped to sort out for the Internal Medicine Residency Program.

Internal Medicine Residency Program

The Internal Medicine Program had thirty residents and was staffed by seven full-time salaried faculty members and thirty-five contracted physicians. Its residents rotated through a variety of subspecialties including Gastroenterology, Pulmonary/Critical Care, Cardiology, Nephrology, Infectious Diseases, Endocrinology, Rheumatology, Hematology/Oncology, Allergy, Dermatology, and Neurology. Exhibit 3 illustrates a schedule of rotations. While in their training program, residents received an annual salary as well as benefits. A first-year resident's salary was $34,000, second-year residents received $35,300, and third-year residents received $36,600. Fellows and fourth-year chief residents received $52,300.

Residents typically worked as part of a ward team that included one attending physician, two second-or third-year residents, and two interns (first-year residents). There were four of these teams, plus one overflow team to pick up the excess capacity. One of the issues that Dr. Bethridge had to manage was the set of guidelines put forth by the Residency Review Committees that placed caps on the number of patients that residents could admit. She commented:

> In order to provide coverage for the hospital, we rely on the other programs, like Family Practice, to help us. Internal Medicine could never provide all the coverage that is needed and meet our educational objectives. I've got to be careful not to overload our residents. One of the ways to do this would be to use hospitalists, but I would need to justify this not just on the educational merits but also financially.

Resident Activities The following Residency Program Analysis contains some information on the services provided by AMEP's residents.

Residents' provision of 24-hour/7-day-a-week coverage at Bennington and Children's Hospital

- Internal Medicine: 13 residents on General Medicine Service, 3 in ICU
- Pediatrics: 7–9 residents on General Pediatric Service, 5 in Pediatric and Neonatal Intensive Service, 2 in Nursery, 1 in ER
- OB/GYN: 7 residents
- Surgery: 4 residents in general/trauma, 1 in pediatrics
- Psychiatry elective: 1–2 residents

Residents' service in clinics

- Internal Medicine
  - The Clinic at Bennington
    Specialty care from City Clinics, People's Clinic
    Internal Medicine Resident Continuity Clinic (38% of resident's clinic needs)
    Multiple subspecialties—electives (2–4 residents also provide inpatient consultation)
    5,400 visits per year
- Other Continuity Clinics
    City Clinics (50% of resident's clinic needs)
    VA Clinic (12% of resident's clinic needs)
- Pediatric
  - City Clinics: 14,500 visits per year (35% of resident's clinic needs)
  - Subspecialty electives (15% of resident's clinic needs)
  - Children's Specialty Care Center (10% of resident's clinic needs)
  - Continuity Clinic with private M.D.'s (15% of resident's clinic needs)
  - Electives (15% of resident's clinic needs)
  - Adolescent, Developmental, and so forth (10% of resident's clinic needs)
- OB/GYN
  3,400 deliveries per year
  - The Clinic at Bennington: 7 clinics per week with 1–2 residents; 6,000 visits per year
  - City Clinics: $200,000 per year contract to provide 6 clinics per week
  - People's Clinic: 3 clinics per week with 1–2 residents
- Surgery
  - The Clinic at Bennington: 4,000 visits per year; 3 clinics per week; 4–6 residents per clinic
- Family Practice
  - Blackstone Family Health Center: 20,000 visits per year
  - St. David's Hospital: Inpatient service
  - Rotate at Bennington in Internal Medicine, Pediatrics, OB/GYN, Surgery ED, Psychiatry, electives

As indicated, Internal Medicine residents provided inpatient coverage for Bennington and also trained in both Bennington's clinics and clinics run by the City of Atherton. Dr. Byron commented on some of the issues surrounding the clinics:

> It's difficult to compare clinic coverage here with coverage in other places. The amount of space is so limited. There are a variety of subspecialty clinics in the hospital and then we have about half of the space in the professional building. However, the main sites that we use for our residency programs are the city clinics, of which there are twelve. These are federally qualified health centers, and we have a long-standing relationship providing residents to these clinics. Since Southwestern bought Bennington, our relationship with the city clinics has been somewhat tense. I think they probably wonder if they could provide patient care for less money with private physicians. We are working with them to determine how best to work together. One of the problems on the clinic side is that they have their own scheduling system, which affects our performance. If we show up for a clinic and there are no appointments scheduled, our productivity looks bad. Nevertheless, the clinics are an integral part of the ambulatory training and continuity experience for our residents.

In addition to ward duty and clinics, residents also participated in curriculum conferences that were offered daily at noon. Some of these conferences were core didactic presentations by faculty, and others were case conferences presented by residents. In addition, there were the morning reports, interactive, case-based conferences offered daily at 7:00 A.M., and grand rounds, a weekly continuing medical education (CME) conference featuring national speakers.

Financial Performance The 2001 budget for the Internal Medicine Residency Program is contained in Exhibit 4. The budget for AMEP overall is contained in Exhibit 5. The Internal Medicine Residency Program, like all the other AMEP residency programs, was under pressure to improve its financial performance. This was difficult because of the poor payer mix (Exhibit 6) and the fact that the budget contained both the training program costs and indigent care costs. Dr. Bethridge explained:

> Southwestern allows us to be in a budget negative position. This is frustrating—you feel somewhat like a corporate underdog. We would prefer to have our services valued at x, believing the training program is worth that, rather than constantly be in a budget negative position. My budget includes the contractual costs of medical subspecialists for the hospital and for their outpatient care to the city clinics. The training program also has the "no preference contract" for all the patients who come through the ER. This can be a good thing for education, but it also means that we must be able to handle the large volume of patients in the context of education. We need a certain volume and diversity of pathology for a good educational experience. We need subspecialists to help us care for the patients, and we need a relatively high volume of patients to ensure diversity. But this means we must provide the subspecialists—and pay them increasingly retail rates—and take the high volume to enhance education. At the same time, we are caring for a mostly indigent patient population, which cannot easily be shifted to another source of care. Most of what is in my budget is not the cost of education; it is the cost of indigent care.

Contracts with Community-based Physicians A key concern for Dr. Bethridge was her relationship with the community-based physicians who served as faculty for her program. These were largely subspecialists who had attending duties and supervised residents on the inpatient wards and in the clinics. Unlike full-time faculty members, however, they were not salaried. Instead, each group of subspecialists had a different contract with

AMEP, which usually was automatically renewed, although some were renegotiated periodically. Some of the physicians also had contacts with Bennington for other services that they provided, such as trauma coverage.

Gary Marks, M.D., had been hired by Southwestern to review these contracts. He commented on the challenges of this undertaking:

> My goal is to bring clarity to the cost structure. There are multiple contracts with numerous community physicians. Some are contracts with Bennington Hospital for availability, some are with Bennington for direct patient care to the medically indigent, and some are contracts with AMEP for curriculum development, GME supervision, and/or direct patient care for inpatients and clinics. The variations make it very difficult to understand the costs, relationships, and opportunities. For example, AMEP is accountable for graduate medical education but employs the primary care physicians and finances the subspecialty care for the medically indigent. Therefore many of the AMEP contracts cover both medical education and patient care.
>
> Another issue you have with some of the physicians is the need to look at all arrangements in their entirety. A physician may be generously compensated on one contract but poorly on another. The more lucrative contracts subsidize the other activities that may not be well reimbursed. People are reluctant to change contracts that may be above market rates for fear that the changes will have adverse effects elsewhere. One admonishment I shared with the people at Southwestern prior to my arrival was not to hire me based on any assumptions regarding the bottom line. My goal is clear and fair contracts. If the contracts and payments are not fair, the physician relationship will fall apart in the long term anyway. We must also be aware that many of the community-based physicians could walk away from Bennington and AMEP with only minor financial implications. They can easily replace the lost revenue working someplace else.

Dr. Bethridge also wanted to be sure that the contracts were appropriate. She realized that even though many of the physicians enjoyed interacting with the residents and valued their affiliation with the educational programs, they also had private practices. One such physician was Harold Davidson, M.D., a cardiologist who worked with the Internal Medicine Program. He described his relationship in these terms:

> I have worked with the training program for almost ten years, although when I relocated to Atherton I had no intention of teaching or becoming affiliated with the GME program. I view myself as a private practice physician as opposed to an "academic" physician, but have enjoyed all my years working with AMEP. When I moved to Atherton, the cardiologist who had previously worked with AMEP resigned to take a job in a different city, so I agreed to assume the responsibilities for cardiology. We negotiated a contract about eight years ago, and it has remained the same since then. I receive a monthly stipend check and within that are the responsibilities to provide medical education for cardiology and provide cardiac care for AMEP's patients. This includes twenty-four-hour, 365-days-a-year coverage of the ER, consultations, diagnostic tests, and invasive procedures and interventions such as angioplasty and coronary stents.
>
> In general the monthly stipend arrangement has worked well. At one point we tried to bill and collect from the patients, but because of the poor payer mix, it wasn't worthwhile. The best we can hope for is Medicare; once in a blue moon you may have a patient insured by a managed care organization, but, overall, cardiology probably is

about 50 percent unfunded. Because of that I think the valuation of the contract is correct. We do occasionally have a slow week, but at other times we may do procedures that would generate well over $20,000 in professional fees if the patients were insured. I work with another physician to split the clinical work; I handle almost all of the teaching duties at conferences and morning reports.

A lot of the teaching—I would say 90 percent—is at the bedside. In terms of my own productivity, I could probably go twice as fast without residents as I do with them, but that depends on how experienced the residents are. On the outpatient side, residents can help my productivity because they can do a lot of the diagnostic work. I supervise and train the residents and they are my responsibility, but given our volume it would be difficult without the residents. I also admit my private patients here. I feel that it is part of the good will that flows. The training program has been very fair with me over the years and so has the hospital, plus the fact that I am here and it is very cost effective and time effective for me to admit my patients here. Overall, the experience has been great. The interactions with the residents keep me on my toes, and I enjoy working with them.

Next Steps

As she analyzed her program, Dr. Bethridge was aware that Southwestern wanted to build a more entrepreneurial culture within AMEP and perhaps see it expand its clinical activities. In the longer term there was the possibility of developing a research partnership with the state university. She also knew that there was some concern about AMEP's capacity to meet the needs of the expanding number of indigent patients. In addition, there might be some changes to the way funds were distributed between AMEP and Bennington. Although she was open to the idea of change, she wanted to be sure that the approach Southwestern and AMEP took did not erode the educational mission of AMEP. She felt it was critical that she work with Dr. Byron to develop a strong case for the Internal Medicine Program and a proposal for an appropriate financial model.

ASSIGNMENT

1. Exhibit 2 shows $7 million on the line "Interns & residents—other program costs." What is the source of this figure? Is it appropriate that this cost center be treated as a service center? If so, why? If not, what rationale would you use for classifying it as a mission center?
2. How do you think the faculty salaries and contract services amounts on Exhibit 4 were determined? What kinds of activities do you think are included in these amounts?
3. Dr. Bethridge has indicated an interest in having a good understanding of the costs and benefits of her program. Assuming the cost object is the education of a medical resident, how would you compute an accurate amount? Specifically, how would you determine the direct costs of a resident and how would you attach an appropriate amount of overhead? What additional information, if any, would you recommend that Dr. Bethridge obtain to make these computations, and from where?
4. How closely do you think the DME and IME payments come to covering the cost of graduate medical education at Southwestern? Where, if at all, do you think there might be slippages between the "real cost" of GME and the payments that are made to cover it? In answering this question, please address the relationship between GME and indigent care. Is the funding for the two activities structured appropriately? If not, how would you change it?

EXHIBIT 1 Charity Care and Community Benefits, 1995–2000 (in thousands of dollars)

	1995	1996	1997	1998	1999	2000
Actual charity care	$6,116	$11,917	$18,318	$21,204	$25,285	$32,598
Other charity care	1,214	1,702	3,073	3,619	3,717	3,713
Unreimbursed Medicaid	1,183		4,271	1,611	2,949	8,252
TOTAL CHARITY CARE	$8,513	$13,619	$25,662	$26,434	$31,951	$44,563
Community benefit	878	2,665	7,795	7,641	7,955	9,244
Unreimbursed Medicare	5,810	5,950	10,870	14,703	26,426	30,715
TOTAL COMMUNITY BENEFIT	$6,688	$8,615	$18,665	$22,344	$34,381	$39,959
TOTAL CHARITY CARE & COMMUNITY BENEFIT	$15,201	$22,234	$44,327	$48,778	$66,332	$84,522

EXHIBIT 2 Cost Allocation Summary from Medicare Cost Report

	Net Expenses for Cost Allocation	New Cap. Rel. Costs—BLDG	New Cap. Rel. Costs—MVBLE	Employee Benefits	Subtotal	Admin & General	Operation of Plant
General Services Cost Center							
New Cap Rel Costs—BLDG	3,193,269	3,193,269					
New Cap Rel Costs—MVBLE	5,622,288		5,622,288				
Employee Benefits	2,834,392			2,834,392			
Admin & General	23,376,594	206,546	363,659	124,734	24,071,533	24,071,533	
Operation of Plant	4,299,794	527,003	927,878	87,811	5,842,486	1,166,441	7,008,927
Laundry & Linen Service	818,118	64,706	113,925		996,749	198,999	184,377
Housekeeping	2,282,932	12,359	21,759	64,302	2,381,352	475,432	35,216
Dietary	1,968,633	84,267	148,366	67,947	2,269,213	453,044	240,117
Cafetaria		32,666	57,514		90,180	18,004	93,081
Nursing Admin	−105,037	21,184	37,298	396	−46,159		60,363
Central Services & Supply	2,564,758	131,126	230,869	55,519	2,982,272	595,405	373,641
Pharmacy	4,010,020	42,841	75,429	103,074	4,231,364	844,783	122,075
Medical Records & Library	1,900,922	37,364	65,786	44,303	2,048,375	408,954	106,469
Biomed Instrumentation	1,245,476	28,316	49,855	17,749	1,341,396	267,807	80,685
Interns & Residents - Other Program	**7,000,000**				**7,000,000**	**1,397,536**	
Inpatient Routine Srvc Cntrs							
Adults and Ped	13,304,172	558,090	982,612	547,134	15,392,008	3,072,928	1,590,269
ICU	5,291,975	125,284	220,584	220,333	5,858,176	1,169,573	356,995
CCU					0		
Pedi -ICU	2,480,837	46,924	82,618	97,551	2,707,930	540,633	133,710
Nursery	3,046,254	61,145	107,656	124,312	3,339,367	666,698	174,231
Ancillary Cost Centers							
Operating Room	7,557,537	192,630	339,158	208,029	8,297,354	1,656,550	548,897
Recovery Room	1,775,321	55,369	97,486	75,086	2,003,262	399,947	157,772
Delivery Room & Labor	2,705,671	40,223	70,819	99,316	2,916,029	582,179	114,613
Anesthesiology	821,096	6,963	12,260	16	840,335	167,771	19,842
Radiology-Diagnostic	4,825,314	129,705	228,368	155,100	5,338,487	1,065,818	369,592
Laboratory	4,825,859	97,932	172,426	107,614	5,203,831	1,038,934	279,056
Whole Blood and Packed Red	1,764,154	8,776	15,452	15,813	1,804,195	360,204	25,008
Respiratory Therapy	3,823,332	18,260	32,150	145,170	4,018,912	802,368	52,032
Physical Therapy	1,259,723	27,505	48,427	50,450	1,386,105	276,733	78,374
Occupational Therapy	331,406	4,437	7,812	14,262	357,917	71,457	12,643
Speech Pathology	198,505	3,588	6,317	8,677	217,087	43,341	10,223
Electrocardiology	410,249	19,904	35,045	15,482	480,680	95,967	56,717
Electroencephalography	151,859	5,281	9,298	5,808	172,246	34,389	15,048
Medical Supplies Charged	8,041,703				8,041,703	1,605,510	
Drugs Charged to Patients	7,088,386				7,088,386	1,415,182	
Nuclear Medicine	726,042	3,751	6,604	18,211	754,608	150,656	10,689
Special Proc/Cath Lab	2,359,044	10,878	19,152	35,649	2,424,723	484,091	30,996
CT Scan	724,315	5,722	10,074	19,739	759,850	151,703	16,305
Renal Dialysis	256,222			148	256,370	51,184	
Outpatient Service Cost Centers							
Clinic	739,573	104,280	183,603	27,666	1,055,122	210,653	297,144
Specialty Care	794,547	39,471	69,496	31,185	934,699	186,611	112,472
Emergency	5,876,226	337,514	594,250	213,502	7,021,492	1,401,827	961,740
Oncology	391,800	85,312	150,207	15,750	643,069	128,387	243,096
Special Purpose Cost Centers							
Kidney Acquisition	393,945	2,031	3,575	7,753	407,304	81,317	5,787
Subtotals	142,977,226	3,179,353	5,597,787	2,825,591	142,930,008	23,739,016	6,969,275
Non Reimbursed Cost Centers							
Gift Flower, Coffee Shop		13,916	24,501		38,4171	7,670	39,652
Star Flight	475,947			3,540	479,487	95,729	
Parking	167,160				167,160	33,373	
Other Non-Reimbursable	975,192			5,261	980,453	195,745	
Total	144,595,525	3,193,269	5,622,288	2,834,392	144,595,525	24,071,533	7,008,927

Laundry & Linen Service	House-keeping	Dietary	Cafeteria	Nursing Admin	Central Service and Supply	Pharmacy	Medical Records & Library	Biomed Instrumen-tation	I&R Services Other Prog. Costs	Total
1,380,125										
34,599	2,926,599									
	103,504	3,065,878								
	40,123	1,643,780	1,885,168							
	26,020		4	40,224						
8,002	161,061		68,084		4,188,465					
	52,622		83,214		345,052	5,679,110				
	45,894		48,415		106		2,658,213			
	34,780		13,617		36			1,738,321		
13,742										
697,297	685,500	1,210,495	429,684	13,897	144,925	1,123,651	242,040	98,768	**3,585,831**	28,287,293
100,989	153,896	18,875	168,862	5,138	55,274	477,090	71,647	98,768	**649,045**	9,184,328
29,548	57,637	26,336	52,032	2,006	36,552	186,051	32,477	118,522	**176,879**	4,100,313
10,037	75,104		78,675	2,545	46,014	301,584	58,761		**358,144**	5,111,160
112,468	236,606		158,862	5,138	1,117,073	109,278	297,501	217,290	**901,939**	13,658,956
47,773	68,009		52,954	1,713	6,996	50,945	37,394	19,754		2,846,519
66,306	49,405		66,571	2,153	97,875	305,691	57,807	59,261	**1,211,844**	5,529,734
	8,553				245,737	54,822	52,119			1,389,179
35,681	159,316		111,960		55,070	52,491	156,680	809,898	**48,240**	8,203,233
6,726	120,289		93,805		96,339	9,586	290,127	79,015	**45,316**	7,263,024
	10,780		12,104				34,413			2,246,704
	22,429		105,908		150,992	52,065	254,243	118,522		5,577,471
29,300	33,784		40,850		16,459	419,169	41,256			2,322,030
	5,450				12,583		10,889			470,939
	4,407		1,513		3,999		3,172			283,742
	24,448		10,591		7,191	1,249	42,556	19,754		739,153
	6,487		4,539		6,846		2,970			242,525
					1,474,942		105,265			11,227,420
						1,516,283	290,994			10,310,845
4,923	4,607		3,026		7,631	8,724	16,621			961,485
10,065	13,361		24,208		80,909	17,858	65,847			3,152,058
	7,028		13,617		42,174	4,351	138,004			1,133,032
					9,202	1,766	7,570			326,092
9,892	128,087		28,747	930	7,928	267,800	9,655		**616,886**	2,632,844
978	48,482		24,208	783	4,756	54,779	5,187			1,372,955
146,498	414,566		169,453	5,481	109,231	649,358	326,042	79,015	**726,522**	12,011,225
14,259	104,788		12,104	391	4,440	12,774	4,946		**90,632**	1,258,886
1,042	2,484		4,539				2,030	19,754		524,257
1,380,125	2,909,507	2,899,486	1,882,142	40,175	4,186,332	5,677,365	2,658,213	1,738,321	**8,411,278**	142,367,402
	17,092									102,831
			1,513	49	442					577,220
										200,533
		166,392	1,513		1,691	1,745				1,347,539
1,380,125	2,926,599	3,065,878	1,885,168	40,224	4,188,465	5,679,110	2,658,213	1,738,321	**8,411,278**	144,595,525

EXHIBIT 3 Schedule of Rotations

Postgraduate Year 1		
Wards	5 months	Night call
Clinic	2 months	No call
ICU	2 months	Night call
Nephrology	1 month	No call
Emergency Department	1 month	19 10-hr. shifts
Behavioral Medicine	1 month	No call
Postgraduate Year 2		
Wards	4 months	Night call (stay until midnight)
Clinic	1 month	No call
ICU	1 month	Night call
Nightfloat/clinic	1 month	6 nights per week (no daytime responsibilities)
Medicine consults	1 month	2 weekends per month (no night call)
Electives (each)	1 month	No call except approx. 3 nightfloat calls per year
Cardiology		
Pulmonary		
Hematology/Oncology		
Gastroenterology		
Postgraduate Year 3		
Wards	2 months	Night call (stay until midnight)
Ambulatory Care Block	4 months	No call except 3 nightfloats per year
ICU	1 month	Night call
Electives	1 month	No call
Infectious Diseases	1 month	No call
Nightfloat	1 month	6 nights per week (no daytime responsibilities)
Neurology	1 month	2 weekends of beeper call
Geriatric Medicine	1 month	No call

EXHIBIT 4 Budget for Internal Medicine Residency Program

Patient revenue			
Total charges		$3,866,365	
Less: CT med. Charges		(1,594,459)	
		2,271,906	
Revenue deductions			
Medicare contractuals	(181,134)		
Medicaid contractuals	(184,294)		
HMO & PPO write-off	(71,156)		
Charity—City Health Assistance Program	(202,030)		
Admin. & other write-offs	(66,837)		
Charity	(616,103)	(1,321,554)	
NET PATIENT CARE REVENUE		$950,352	
Revenue from contracts			
University contract	$4,379		
5th-floor GI Clinic	24,000		
Bennington hospitalists	174,055	202,434	
Revenue from CT medical collections		335,501	
Reimbursed grand rounds		27,050	
Coordinating Board		348,864	
TOTAL REVENUE			$1,864,201
Expenses			
Faculty salaries	$868,353		
Resident salaries	1,187,985		
Admin. salaries	73,999	$2,130,337	
Benefits (salaries × 12.1%)		292,864	
Contract services			
Inpatient coverage, teaching, some outpatient services[a]	$597,392		
Clinic attending stipends[b]	102,600		
General medical[c]	58,800	758,792	
Grand rounds (honorarium & travel, CME consort fee, supplies)		27,050	
Supplies (food, office supplies)		10,700	
Apparel for residents		2,190	
Dietary (transfer in) (resident meals, meals for functions)		33,193	
Maintenance		1,450	
Equipment		9,070	
Permits, licenses for residents, training program		10,563	
Telephone, paging		12,600	
Personal dues, licenses		13,490	
Books, subscriptions (incl. $12,400 for resident book funds)		18,500	
Conventions, education		27,350	
Travel (noneducation)		1,000	
Recruitment (incl. match fees, brochures, residency fairs)		8,455	
Postage		1,000	
Gifts, entertainment		4,250	
Insurance		53,844	
Total bad debt		331,743	
TOTAL EXPENSES			$3,748,441
NET PROFIT (LOSS)			($1,884,240)

[a]Includes Cardiology, Geriatrics, GI coverage, ICU, Nephrology, Neurology, Hematology/Oncology, and Rheumatology.

[b]Includes Allergy, Cardiology, Dermatology, Gastroenterology, Neurology, Pulmonary.

[c]Includes weekend inpatient coverage and VA clinic coverage.

EXHIBIT 5 Budget for Faculty Practice Plan

	Total programs	Trauma	Capital OB	Pediatrics	OB/GYN	Midwives	Internal Medicine
Gross patient revenue less contracted medical charges	17,312,348	979,356	899,201	811,527	6,597,600	424,162	2,271,906
Revenue deductions							
Contractual adjustments	(3,774,609)	(245,610)	(123,864)	(158,488)	(1,579,437)	(188,712)	(365,428)
HMO/PPO write-off	(1,703,257)	(212,164)	(266,647)	(84,009)	(118,899)		(71,156)
Charity—city MAP	(804,358)	(56,684)			(181,164)		(202,030)
Admin. & other write-offs	(982,972)	(52,230)	(30,793)	(37,276)	(352,019)	(30,793)	(66,837)
Charity	(2,070,678)	(107,624)	(5,314)	(33,849)	(978,391)	(5,314)	(616,103)
Total of revenue deductions	(9,335,874)	(674,312)	(426,618)	(313,621)	(3,209,910)	(224,819)	(1,321,554)
NET PATIENT REVENUE	7,976,474	305,044	472,583	497,905	3,387,690	199,343	950,352
Other revenue							
Revenue—contract	9,148,009			464,400	268,144	184,800	202,434
Revenue—CT med.	1,083,180			316,352	335,113		335,501
Revenue grants	38,900			10,000			27,050
Revenue grants—Coord. Board	891,840			149,592			348,864
TOTAL OF OTHER REVENUE	11,161,929			940,344	603,256	184,800	913,848
TOTAL OPERATING REVENUES	19,138,404	305,043	472,583	1,438,249	3,990,947	384,143	1,864,200
Expenses							
Total salaries	11,490,542	200,002	326,459	2,279,580	1,800,720	258,317	2,130,337
Total benefits	1,556,162		44,879	275,829	247,550	35,512	292,864
Total professional fees—medical	2,198,478			227,766	622,000		758,792
Total professional fees—other	43,440			15,390			27,050
Total supplies	447,433		31,286	29,609	12,806	4,400	46,333
Total depreciation & amortization	85,286						
Total insurance	612,369	10,212	15,312	46,560	224,724	18,528	53,844
Total bad debt	1,944,373	117,631	14,046	131,036	945,934	14,046	331,743
Total other expenses	1,346,381	4,005	35,616	143,190	121,395	13,848	107,478
Total utility expenses	7,484				4,772		
Net work Allocation							
Total expenses	19,731,946	331,850	467,597	3,148,961	3,979,902	344,651	3,748,441
NET INCOME (LOSS)	(593,543)	(26,807)	4,985	(1,710,712)	11,045	39,492	(1,884,241)
Deduct $7.5 million from admin. for reallocation							
Reallocation of $7.5 million from admin. to GME prog.				1,619,349	846,115		2,458,465
PFS collection fee (8% of net patient rev.)		(14,993)	(36,683)	(29,350)	(195,340)	(14,824)	(49,489)
Admin. fee (7% of net patient rev.)		(13,119)	(32,098)	(25,681)	(170,923)	(12,971)	(43,303)
ADJUSTED NET INCOME (LOSS)		(54,919)	(63,795)	(146,393)	490,897	11,697	481,433

Surgery	Psychiatry	Faculty Clinic	Study Group	Family Practice	Transitional	Fac Prac FP	Coding & Comp	PFS	Admin
1,687,794	0	830,833	0	1,619,316		1,190,653			
(476,358)		(102,316)		(326,208)		(208,188)			
(202,458)		(250,288)		(262,157)		(235,479)			
(267,784)		(593)		(85,354)		(10,749)			
(30,225)		(40,550)		(229,308)		(112,943)			
(298,708)		(4,668)		(13,873)		(6,833)			
(1,275,533)		(398,414)		(916,900)		(574,191)			
412,261		432,419		702,416		616,462			
201,432				100,000				76,800	7,650,000
20,550	75,665								
			1,850						
				393,384					
221,982	75,665		1,850	493,384				76,800	7,650,000
634,243	75,665	432,419	1,850	1,195,800		616,462		76,800	7,650,000
420,832	8,200	459,929	328	1,620,356	260,412	529,638	179,086	483,422	532,923
57,853	1,127	62,747	45	220,456	35,800	72,811	68,969	66,457	73,263
325,600	205,800			78,020					
				1,000					
8,584	1,670	31,566	200	113,345	2,680	52,629	800	102,600	8,924
									85,286
40,836		4,812		92,952	92,472	10,428			1,689
163,033		27,521		133,586		65,796			
90,574	2,700	152,181	1,130	276,431	11,640	112,354	7,500	214,450	51,888
720									1,992
1,108,033	219,497	738,757	1,703	2,536,147	403,003	843,655	256,355	866,930	755,964
(473,790)	(143,831)	(306,338)	147	(1,340,347)	(403,003)	(227,193)	(256,355)	(790,130)	6,894,036
									(7,500,000)
524,898				1,223,517	368,637				459,019
(19,938)	(0)	(32,392)	(0)	(45,506)		(44,053.29)		482,568	
(17,446)	(0)	(28,343)	(0)	(39,818)		(38,546.63)			422,247
13,724	(143,831)	(367,072)	147	(202,154)	(34,366)	(309,793)	(256,355)	(307,562)	275,302

EXHIBIT 6 Payer Mix

	2000 actual	2001 budget		2001 6-month projection	
	Payer mix	Payer mix	Collection %	Payer mix	Collection %
Residency program					
Self-pay	31.4%	30.1%	5.3%	31.8%	2.8%
Medicare	29.8	27.5	47.4	27.7	44.7
Medicaid	17.2	13.8	26.2	15.2	29.4
Managed care	14.8	10.0	60.8	13.3	50.9
City Health Assistance Program	6.8	18.6	0.9	12.0	12.6
TOTAL	100.0%	100.0%	28.1%	100.0%	28.1%
Faculty practice					
Self-pay	4.2%	3.9%	50.1%	3.4%	47.2%
Medicare	18.9	22.4	50.0	24.8	48.5
Medicaid	2.6	5.2	37.5	2.8	32.8
Managed care	74.2	68.5	51.0	68.7	49.4
City Health Assistance Program	0.1	0.0	0.0	0.2	0.0
TOTAL	100.0%	100.0%	50.0%	99.9%	48.5%