Cost Determination

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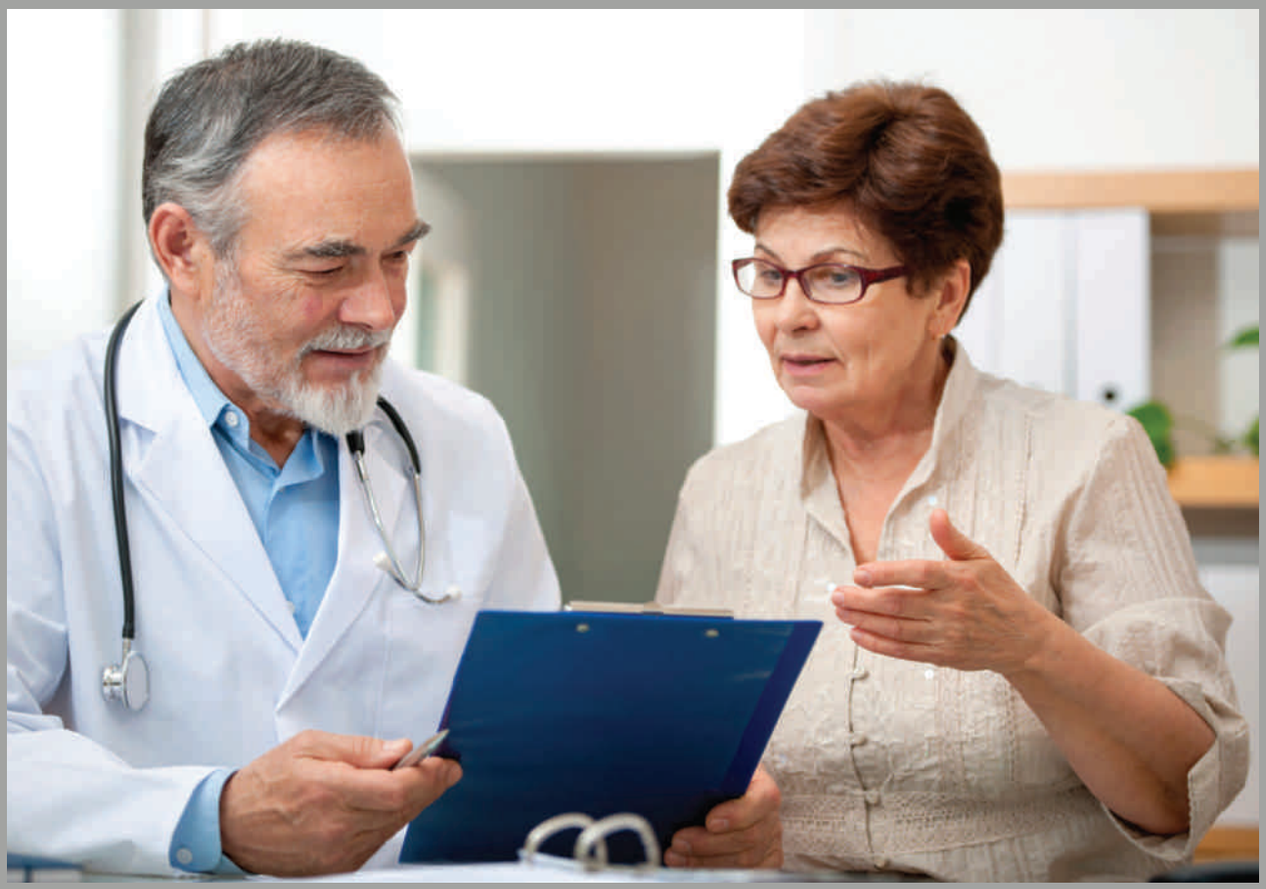

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Learning Outcomes

By the end of this chapter, you will be able to:

- Explain the purpose of cost determination
- Classify costs as direct or indirect (overhead) costs
- Employ common cost allocation methods including the direct allocation method and the step-down method
- Employ common cost allocation methods for patient-level costs, including relative value units, ratio of cost to charges, and activity-based costing

Introduction

How much does it cost for a patient to visit a hospital? Kimberly Su, vice-president for patient services at Middaugh United Hospital, thought this question would have an easy answer. As it turns out, it's not quite so easy. To answer this question, one needs to know the condition of the patient and whether he or she will be a patient in the emergency department or admitted to a medical/surgical unit or intensive care unit. This seems reasonable to Ms. Su. Different conditions require different levels of care and therefore have different costs. To answer this question, one also needs to know what method of accounting for costs will be employed.

Now this is getting complex. How can a manager know what method of accounting for costs is being employed and what difference that makes it determining the cost for a patient to visit a hospital? This chapter considers the issues involved with cost determination and provides methods for allocating costs to departments and patients.

4.1 Cost Determination

The presentation of financial statements and the evaluation of corporate performance based upon financial statements rely upon financial accounting methods. The purpose of financial accounting is to record and compile business and financial transactions, assure the accuracy of transactions, and prepare reports of the results. On the other hand, the purpose of managerial accounting is to provide reports that follow internal conventions for decision making on the future of the organization. Halfway between the externally imposed processes of financial accounting and the internally determined processes of managerial accounting is cost determination, which is also called cost accounting. Cost determination is just as simple as it sounds: a process to determine costs. Cost determination is also quite challenging when one asks the question: the cost of what?

The cost of operating the healthcare organization as a whole is revealed by examination of the income statement. Total operating expense is the cost of the health services–related aspects of operating a healthcare organization. Total expense is the cost of all activities of the organization, including those that are not related to core operations. Expenses associated with the rental of office space and equipment to physicians for use in their private practice are an example of a nonoperating expense.

The cost of operating a department within a healthcare organization goes beyond the level of detail considered material in the preparation of financial statements. Decisions on hiring staff and purchasing supplies are typically made at the departmental level and may be recorded in financial accounting systems as occurring at the department level. Decisions on the building and maintenance of clinical space and administrative costs are made at the highest levels in the organization and recorded for the organization as a whole. Therefore, determining the cost of operating a department involves using the financial accounting systems to determine department-specific costs and using managerial accounting methods to examine building, maintenance, administration, and other costs.

Analyze This

For Middaugh United Hospital, the total of 24,769 inpatient days in 2012 included 22,787 patient days in general medical/surgical care units and 1,982 patient days in the intensive care unit. A patient day is a count of a patient being in the hospital for a full day, often counted as being in the hospital at midnight. There were also 25,573 patient visits to outpatient departments and 7,733 visits to the emergency department. In total, there were 58,075 patient days or patient visits in 2012. Total operating expenses in 2012 were $201,885,310.

Is $3,476.29 ($201,885,310 divided by 58,075) a good figure for Kimberly Su to use as a cost of a patient visit? Explain your reasoning.

The purpose of cost determination, quite simply, is to know the cost of providing healthcare services. Knowing the cost of operating a department is important for managing a healthcare organization for at least two reasons. First, total costs for the organization are nothing more than the sum of costs that are unique to each department and the costs that are common to all departments. In planning and managing the overall cost of the organization, managers must know their individual costs in order to put into place any changes that affect total costs in appropriate ways. For example, it is possible to control costs by decreasing salary expenses by 5% for all departments. However, this is often a bad management practice. Departments that have been efficient in the past and have very low salary expenses per patient might not require the same reductions as departments that have not been efficient and have very high salary expenses per patient. Detailed information on costs is necessary to make detailed and appropriate decisions.

Second, revenues are generally directly attributable to patients being treated in departments. Matching costs with revenues permits analyses of the sources of profits and losses. We noted in Chapter 3 that Middaugh United Hospital experienced net operating losses in both 2011 and 2012. Where did those losses occur? In order to make decisions that affect staffing and other investments in resources, we should understand the profit or loss implications of those decisions. Healthcare organizations, both for-profit and not-for-profit, may not require that every department earn a profit. Still, it is important to know where profits and losses occur.

From the Front Lines

It is frustrating, because our organization constantly establishes expense reduction policies that apply to all departments equally. It was determined that travel expenses for trainings will be cut by 25% for 2014. This means that we can only send three staff members to training meetings, while last year we sent four. The organization will save $200,000 in travel expenses for 2014, but it means that some of our staff will lack sufficient training.

Source: Dermatology department manager.

For Review:

1. Why do organizations want to know the cost of a department or service?
   Organizations seek to understand the profitability of departments and services provided. Profits are revenues minus costs. Net patient revenues are readily obtained from financial accounting information and can easily be assessed at the department or service level. The costs of individual departments and services are not readily available from financial accounting information and require analysis.

4.2 Cost Classification

To be more precise in managerial accounting terminology, the **full cost** of operating a department or division of a healthcare organization goes beyond the recording process in financial accounting systems. Full costs are the sum of costs that can be classified as either **direct costs** or **indirect costs**. Direct costs are expenses that can be appropriately recorded as being associated with services in a particular department. For example, patient reception, nursing, and billing personnel assigned to the department of internal medicine may only work in that department and have their time-keeping and salary payments recorded as expenses in the department of internal medicine. Salary costs for these personnel would be classified as direct costs to the department. Similarly, supplies and minor equipment expenses may also be recorded as direct costs to a department.

Indirect costs are expenses that cannot be easily recorded as being associated with a single department. For many expenses, the nature of their use is across more than one department. The office of patient financial services is an example of an indirect cost. The activities of this office are not associated with only one department. It is available for patients to make payments, discuss their bills, or make payment arrangements. Patients having been treated in every department of the organization may use the office of patient financial services. Similarly, the costs of general administrative services, building upkeep and repair, and many other expenses are indirect costs from the perspective of clinical departments. Indirect costs are determined partly by costs that truly overlap departments.

Indirect costs are also determined by the limited capabilities of many accounting systems. The costs of specific medical supplies, devices, and drugs can be assigned to patients being treated in specific departments and are therefore direct expenses. Expenses associated with central supply administration and pharmaceutical management are often classified as indirect costs. Tracking the activity of the supply personnel and pharmacists and determining how much of their time was associated with specific medical supplies, devices, and drugs might be possible. If such tracking were performed, central supply administration and pharmacy management costs could become direct costs. However, this tracking could be an expensive undertaking. Therefore, costs associated with supply personnel and pharmacists may be direct costs in organizations with sophisticated accounting systems and indirect costs in other organizations. It can be challenging to compare costs between healthcare organizations, since the accounting systems will determine the designation as direct or indirect costs.

Overhead Costs

The term **overhead costs** is often used to refer to expenses that are recorded as indirect costs. Overhead refers to expenses that are not associated with patient care activities. Some indirect costs, such as those associated with providing patient financial services is overhead in both senses—an indirect cost that is not associated with patient care. Other indirect costs, such as those associated with the management of the pharmacy, are very much associated with patient care. Caution must be given in comparing indirect costs and overhead rates between organizations. Some of the difference may be associated with different levels of expenses on nonpatient care services, whereas some of the difference may be associated with different levels of sophistication in accounting systems.

Cost Report Information

A high-level view of costs and other information on Middaugh United Hospital is provided in Exhibit 4.1, as derived from the hospital's cost report. There are many limitations to cost reports that follow Medicare guidelines (Magnus & Smith, 2000). These cost reports are presented in a common format and focused on the hospital alone. For organizations that include other patient care activities and multihospital organizations, it is difficult to use information from standard cost reports in isolation.

Exhibit 4.1 Middaugh United Hospital cost report information

Routine Service Cost Centers	Square Feet	Direct Salaries	Total Assignable Costs	Net Patient Revenues
General inpatient	96,430	$13,728,026	$35,545,320	$55,193,622
Intensive care unit	15,014	2,735,438	8,108,578	11,841,099
Outpatient clinic	11,256	6,505,248	10,146,780	6,179,313
Emergency	12,762	5,130,794	7,733,409	20,759,127
Total routine service	135,462	$28,099,506	$61,534,087	$93,973,161
Ancillary Service Cost Centers				
Laboratory	19,160	$2,419,300	$10,103,382	$31,597,516
Operating room	20,679	3,965,675	13,094,152	24,643,173
Radiology	19,044	3,150,642	8,604,182	19,567,077
Respiratory therapy	2,224	773,720	1,718,147	6,754,559
Pharmacy and other	19,100	5,041,333	15,938,617	19,398,678
Total ancillary service	80,207	$15,350,670	$49,458,480	$101,961,003
General Service Costs Centers				
Employee benefits	560	$2,951,861	$17,191,130	
Administration	8,210	8,968,159	31,045,838	
Miscellaneous general service	4,870	13,396,324	42,655,775	
Total general service	13,640	25,316,344	90,892,743	
Total	229,309	$68,766,520	$201,885,310	$195,934,164

Source: Author's calculations.

As displayed in Exhibit 4.1, salaries and wages of persons who are clearly assigned to specific departments are designated as direct costs in the second column. Also designated as direct costs are nonsalary expenses that are assignable to a specific department, such as supplies, medications, and equipment. The total of the salary and nonsalary direct costs is labeled total assignable costs.

Routine service cost centers are the departments or units within an organization where patients are located. The general inpatient unit, which may be divided into several departments or units at large hospitals, is the primary location for patients who have hospitalizations that require overnight stays. The intensive care unit (ICU) is a specialized unit for

seriously ill or injured patients with higher levels of staffing and monitoring than the general inpatient unit. Some patients may be located in the ICU for part of their hospital stay and then be transferred to the general inpatient unit when their condition has improved. Outpatient clinics are departments or units where patient visits do not involve overnight stays. Some outpatient clinics are no different from physician offices, other than being located at a hospital. Other outpatient clinics involve very intensive therapy, just not an overnight stay. Emergency departments specialize in treating unscheduled visits covering a wide-range of conditions, from common illnesses to the most severe injuries.

Ancillary service cost centers are the departments or units that provide specific, necessary services to patients located in routine service departments. For many patients, ancillary services will be billed separately from routine services. The laboratory receives samples and specimens, conducts analyses, and provides diagnostic and consultative information to clinical staff treating patients. The operating room is the temporary location for patients undergoing procedures that require a sterile environment, specialized equipment, and potentially anesthesia. Radiology is the department responsible for images ranging from simple X-rays to identify broken bones to magnetic resonance imaging (MRI) to identify brain cancer. Respiratory therapy treats acute breathing problems associated with heart attacks or strokes and chronic lung problems such as asthma. The pharmacy provides medications to patients in any routine services department.

For the purposes of tracking services, accounting systems record charges associated with services that are provided to patients. Charges are determined by the healthcare organization and included in the accounting system in a file called the *chargemaster*. As will be discussed in Chapter 5, these charges may not actually reflect amounts that are billed to patients or their insurance companies, or the amounts that the organization receives. Net patient revenues, reflecting the actual amount of payments, and any allowances for uncollectable accounts, are a better measure for assessing the profitability of a department.

General services cost centers are departments where costs are incurred without the ability to assign them to patient care services. Some general service costs, such as employee benefits like health insurance, life insurance, and disability income support, are recorded as general service costs due to the reporting practices of some cost reports. It is likely within the capacity of many accounting systems to align employee benefit costs with direct salary costs and, thus, reclassify employee benefits as direct costs. Administration, which includes accounting, finance, and marketing, as well as miscellaneous general service costs, such as maintenance, housekeeping, pharmacy administration, and other nonclinical services, include a mixture of costs that might be reclassified as direct costs with sophisticated accounting systems, and costs that are truly indirect costs. There are no revenues associated with the nonpatient care services in the general service departments.

Analyze This

What percentage of costs for Middaugh United Hospital are overhead costs? Are overhead costs too high? Explain your reasoning.

The basic presentations of cost reports provide a summary classification of department costs being direct costs or indirect costs. These reports form the starting point for further analyses to determine full costs for patient service departments.

For Review:

1. What is the difference between direct and indirect costs?
   Direct costs are associated with a specific department through the financial accounting system. Indirect costs are not associated with a specific department, either because the costs are associated with services provided to multiple departments or because of limitations in the sophistication of an accounting system.

2. For what types of departments are revenues available?
   Revenues are associated with services provided to patients. Routine services and ancillary services are billed to patients and result in revenues. General services provided within the organization, such as administration, are not directly billed to patients and have no revenues.

4.3 Department Cost Allocation Methods

For some uses of cost information, the basic presentation of cost reports is sufficient. Understanding the direct costs associated with the ICU permits calculation of the routine salary cost per patient day:

$$\frac{\$2{,}735{,}438}{1{,}982 \text{ patient days}} = \$1{,}380$$

and the total routine direct costs per patient day:

$$\frac{\$8{,}108{,}578}{1{,}982 \text{ patient days}} = \$4{,}091$$

These numbers may be used to benchmark costs against other healthcare organizations. For other uses of cost information, the basic presentation of cost reports does not sufficiently capture the total cost of services. For the ICU, $11,841,099 in net patient revenues less the $8,108,578 in directly assignable costs suggests a profit of $3,732,521 in 2012. This profit does not capture any indirect costs that may be associated with the ICU.

To determine the full costs associated with each routine service and ancillary service department, a method of allocating indirect costs must be selected and applied. There are two common methods employed by healthcare organizations for allocating indirect costs: the **direct method** and the **step-down method**. Both methods require the designation of a **cost pool** and a **cost driver**. A cost pool is a collection of direct or indirect costs. For most organizations, the financial accounting system permits the department or unit to be the cost pool. A cost driver is a statistical measure that reflects a sensible and meaningful way in which costs might be assigned if the cost accounting system were more sophisticated.

For the case of Middaugh United Hospital, data available in the cost report were selected as cost drivers. It was decided that employee benefits would be allocated on the basis of direct salaries. Since employee benefits are likely directly proportional to salary expense, this is a sensible and meaningful cost driver. Administration expenses are allocated on the basis of total assignable costs, and miscellaneous general services expenses are allocated on the basis of the square feet of space occupied by each department. Administrative services are likely related to the overall level of activity in a department, and general services are largely related to maintenance of the building and the amount of space occupied.

Direct Method

The direct method, also called the *direct apportionment method*, seeks to allocate costs from the general services departments to each patient service department in one step. The direct method requires use of the financial accounting system to record all directly assignable expenses for each cost pool and to select a cost driver for each indirect cost pool.

The calculations performed by the direct method are displayed in Exhibit 4.2. For simplicity of display, the two inpatient departments (general inpatient and intensive care unit) have been combined, as well as the two outpatient units (outpatient clinic and emergency department) and all of the ancillary services. To determine the statistics for the cost allocation, only the values for the patient services departments are considered. For allocation of employee benefits costs, the total of assignable costs of employee benefits is the cost pool ($17,191,130, from Exhibit 4.1). The direct salaries for each patient services department are the cost drivers ($43,450,176, from Exhibit 4.1). The employee benefits cost pool is divided by the subtotal of direct salaries for the patient services departments:

$$\frac{\$17{,}191{,}130\ (\text{employee benefits cost pool})}{\$43{,}450{,}176\ (\text{subtotal of direct salaries})} = \$0.40$$

This amount, 40 cents per dollar of direct salaries, is then applied to the direct salaries in each department, as presented in Exhibit 4.2.

Exhibit 4.2 Middaugh United Hospital direct cost allocation method

Department	Direct Salaries	Total Assignable Costs	Square Feet
Total inpatient	$16,463,464	$43,653,898	111,444
Total outpatient	11,636,042	17,880,189	24,018
Total ancillary service	15,350,670	49,458,480	80,207
Subtotal of patient services	$43,450,176	$110,992,567	215,669
Employee benefits: Total assignable costs per dollar of direct salaries	0.40		
Administration: Total assignable costs per dollar of total assignable costs		0.28	
Miscellaneous general service: Total assignable costs per square foot			197.78

Similar calculations are performed for administration costs and miscellaneous general services costs. For allocation of administration costs, the cost pool is total assignable costs of administration, which is divided by the cost driver of the subtotal of total assignable costs for the patient services departments:

$$\frac{\$31{,}045{,}838\ (\text{total assignable costs})}{\$110{,}992{,}567\ (\text{subtotal of total assignable costs})} = \$0.28$$

This amount, 28 cents per dollar of total assignable costs, is then applied to the total assignable costs in each department.

For allocation of miscellaneous general services costs, the cost pool is total assignable costs of miscellaneous general services costs, which is divided by the cost driver of the subtotal of square feet of space occupied by the patient services departments:

$$\frac{\$42{,}655{,}775\ (\text{total assignable costs of misc. general services costs})}{215{,}669\ (\text{subtotal of square feet of space})} = \$197.78$$

This amount, $197.78 per square foot, is then applied to the square feet in each department. The addition of the total assignable costs and the costs allocated by the direct method yield the total cost for each department, as displayed in Exhibit 4.3.

Exhibit 4.3 Middaugh United Hospital direct cost allocation results

Department	Employee Benefit Costs Allocated	Administrative Costs Allocated	Miscellaneous General Service Costs Allocated
Total inpatient	$6,513,795	$12,210,474	$22,041,787
Total outpatient	4,603,818	5,001,285	4,750,365
Total ancillary service	6,073,517	13,834,079	15,863,623
Total	$17,191,130	$31,045,838	$42,655,775

Department	Total Assignable Costs	Cost Allocated by the Direct Method	Total Costs
Total inpatient	$43,653,898	$40,766,056	$84,419,954
Total outpatient	17,880,189	14,355,468	32,235,657
Total ancillary service	49,458,480	35,771,219	85,229,699
Total	$110,992,567	$90,892,743	$201,885,310

Note that in the process of allocating employee benefits and administration and miscellaneous general services costs, the total assignable costs remain unchanged, and the total costs for the hospital remain unchanged. The direct method only allocates costs among departments; no costs are gained or lost.

The advantage of the direct method is that it is simple to apply, and the cost allocation amounts (the 40 cents per direct salary dollar, 28 cents per total allocation cost, and $197.78 per square foot of space occupied) are easy to explain and can be viewed as the "tax" for each indirect service that is applied to each patient service department. The disadvantage of the direct method is that it does not provide the same level of accuracy as the step-down method.

Step-Down Method

The step-down method is conceptually similar to the direct method, with the addition of intermediate steps for each cost allocation. As demonstrated in Exhibit 4.4, all of the departments are included from the start of the process. For the first set of costs to be allocated (done, by convention, in order of presentation), the measures for all departments below it on the list are calculated. For allocation of employee benefits costs, the cost pool is the total of assignable costs of employee benefits, which is divided by the cost driver of the direct salaries for the departments, except employee benefits services itself:

$$\frac{\$17{,}191{,}130\ (\text{total of assignable costs of employee benefits})}{\$65{,}814{,}659\ (\text{cost driver of direct salaries})} = \$0.26$$

The total salary costs in each department are then multiplied by this amount, 26 cents per dollar of direct salaries, to perform the allocation.

For example, in administration, $8,968,159 in direct salaries is multiplied by $0.26 to yield $2,342,530 in employee benefits costs. The employee benefit cost allocation is added to the initial total assignable costs to yield a subtotal of costs. Again for administration, the initial total assignable costs of $31,045,838 are increased by the $2,342,530 allocation of employee benefits costs to yield a subtotal of $33,388,368. Note that as compared to the direct method, the cost driver of employee benefits under the step-down method is only 26 cents, instead of 40 cents. This is because some employee benefits costs are allocated to administration and general services under the step-down method.

In the second step, the new subtotal of costs for administration becomes the cost pool to be allocated ($33,388,368). Since administration costs are allocated by the cost driver of total assignable costs, administration costs are divided by the new subtotal of the departments, except for employee benefits, which has been completed, and administration itself:

$$\frac{\$33{,}388{,}368\ (\text{administration costs})}{\$168{,}496{,}942\ (\text{new subtotal of the departments})} = \$0.20$$

This amount, 20 cents per dollar of total assignable costs, is then applied to the total assignable costs in each department.

For example, miscellaneous general services total assignable costs of $46,154,964 are multiplied by 20 cents to yield an allocation of administration costs of $9,145,798. The administration cost allocation is added to the subtotal of total assignable costs to yield yet another subtotal of costs. For miscellaneous general services total assignable costs of $46,154,964 are increased by $9,145,798 to yield the second subtotal of $55,300,762. Note that as compared to the direct method, the cost driver of administration under the step-down method is only 20 cents, instead of 28 cents. This is because some administration costs are allocated to miscellaneous general services under the step-down method.

In the third step the new subtotal of costs of miscellaneous general services costs becomes the cost pool to be allocated. The cost pool is divided by the cost driver of total occupied square feet of the departments, except employee benefits and administration, which have been completed, and miscellaneous general services itself.

$$\frac{\$55{,}300{,}762\ (\text{subtotal of misc. general services costs})}{215{,}669\ (\text{total occupied square feet})} = \$256.42$$

This amount, $256.42 per square foot, is then applied to the direct salaries in each department. The miscellaneous general services cost allocation is added to the subtotal to yield total costs. For total inpatient services, 111,444 square feet occupied is multiplied by $256.42 to yield a miscellaneous general services cost allocation of $28,575,911. For total inpatient services, the subtotal of $57,456,572 is increased by the cost allocation of $28,575,911 to yield a total cost of $86,032,483. Note that as compared to the direct method, the cost driver of miscellaneous general services under the step-down method is $256.42, instead of $197.78. This is because miscellaneous general services costs include a share of employee benefits costs and administration costs under the step-down method.

Exhibit 4.4 Middaugh United Hospital step-down cost allocation

Step-Down Step 1	Total Assignable Costs	Salaries	Employee Benefits Allocation	Subtotal
Employee benefits	$17,191,130	—		
Administration	$31,045,838	$8,968,159	$2,342,530	$33,388,368
Miscellaneous general	42,655,775	13,396,324	3,499,189	46,154,964
Total inpatient	43,653,898	16,463,464	4,300,342	47,954,240
Total outpatient	17,880,189	11,636,042	3,039,394	20,919,583
Total ancillary service	49,458,480	15,350,670	4,009,675	53,468,155
Total	$201,885,310	$65,814,659	$17,191,130	$201,885,310

Step-Down Step 2	Subtotal Assignable	Subtotal Excluding Administration	Admin. Allocation	Subtotal
~~Employee benefits~~				
Administration	$33,388,368	—		
Miscellaneous general	$46,154,964	$46,154,964	$9,145,798	$55,300,762
Total inpatient	47,954,240	47,954,240	9,502,332	57,456,572
Total outpatient	20,919,583	20,919,583	4,145,302	25,064,885
Total ancillary service	53,468,155	53,468,155	10,594,937	64,063,092
	$201,885,310	$168,496,942	$33,388,369	$201,885,311

(continued)

Exhibit 4.4 Middaugh United Hospital step-down cost allocation *(continued)*

Step-Down Step 3	Subtotal Assignable	Square Feet	Misc. Allocation	Total Costs
~~Employee benefits~~		—		
~~Administration~~		—		
Miscellaneous general	$55,300,762	—		
Total inpatient	$57,456,572	111,444	$28,575,911	$86,032,483
Total outpatient	25,064,885	24,018	6,158,575	31,223,460
Total ancillary service	64,063,092	80,207	20,566,276	84,629,368
	$201,885,311	215,669	$55,300,762	$201,885,311

As with the direct method, note that in the process of allocating employee benefits, administration, and miscellaneous general services costs, the total costs for the organization remain unchanged. The step-down method only allocates costs among departments; no costs are gained or lost.

Note also that the total costs under the direct method and the step-down method are slightly different. As demonstrated in Exhibit 4.5, for the total of the inpatient service departments, the cost is $1.6 million (1.9%) lower under the direct method, the total of the outpatient service departments is $1.0 million (3.2%) higher under the direct method and the total of the ancillary service departments is $0.6 million (0.7%) higher under the direct method. With both methods, the routine services provided for inpatient and outpatient care are associated with losses, and the ancillary services are associated with profits. Total costs and total profits or losses do not differ, only the allocation among departments.

Exhibit 4.5 Comparison of direct and step-down cost allocation results

Department	Net Patient Service Revenues	Direct Method Total Costs	Step-Down Method Profits (losses)
Total inpatient	67,034,721	(17,385,233)	(18,997,762)
Total outpatient	26,938,440	(5,297,217)	(4,285,020)
Total ancillary service	101,961,002	16,731,303	17,331,634
Total	195,934,163	(5,951,147)	(5,951,148)

The advantage of the step-down method is that it is conceptually more appealing as it allocates funds among indirect cost departments, recognizing that the salaries in administration should bear a share of employee benefits costs. Further adding to its appeal is that it is required for completion of the Medicare Cost Report. The Medicare Cost Report provides detailed financial information on an organization providing services to Medicare patients that follows specific accounting rules. Hospitals, skilled nursing facilities, health centers, and selected other healthcare organizations are required to complete a Medicare Cost Report on an annual basis. Therefore, if an organization is going to be required to complete a Medicare Cost Report, they can use it without further work for internal purposes. The disadvantage of the step-down method is that it is not as easy to explain as the direct method. In practice, one often finds small percentage differences between the direct method and the step-down method, and the choice may be one of simplicity of presentation (direct method) versus a slight improvement in accuracy (step-down method).

Analyze This

If you were the manager of Outpatient Services at Middaugh United Hospital, which method of cost allocation would you prefer to see the hospital use? Explain your reasoning.

The direct and step-down methods of cost allocation provide an improved view of full costs for patient service departments. This improved view comes from allocation processes that attempt to find allocation measures (in our example, these would be percent of salary, total assignable costs, and square feet of space occupied) that yield allocations that are similar to what one imagines the results would have been had a more sophisticated accounting system been in place. The use of either method prompts the question, is a more sophisticated accounting system available, and if it is, why isn't it used?

Without moving toward different accounting methods, there are differing levels of sophistication among traditional accounting systems. Some systems require entry of more detailed information and thereby yield more of the costs as assignable and fewer costs in the indirect cost departments. In the Middaugh example, inclusion of employee benefits in the departments would have reduced the costs to be allocated by $17,191,130 (19% of costs that were allocated).

Organizations periodically make decisions on accounting system purchases and take into consideration the costs among alternative systems and the value of the information in making more precise decisions. Of course, it is often difficult to determine the value of added information when one doesn't know how different the results might appear. It is common to benchmark the practices of organizations that employ more sophisticated accounting systems to see how differently they make decisions and improve operations. One analysis of hospitals found that the use of more detailed accounting systems was associated with lower administrative expenses, but it was not associated with any difference in clinical services expenses (Pizzini, 2006). Thus, it may be difficult to know if the use of more sophisticated accounting systems is worth the cost.

For Review:

1. What is the difference between a cost pool and a cost driver?
   A cost pool is a collection of direct or indirect costs based upon information from a financial accounting system. It is typically a department or service provided by an organization. A cost driver is a statistical measure that reflects a sensible and meaningful way in which indirect costs are allocated to revenue-producing departments to yield a measure of total costs. Indirect cost pools are allocated to direct cost pools using a cost driver.

2. What is the key difference between the direct method and the step-down method of indirect cost allocation?
   The direct method uses cost drivers to allocate indirect cost pools to revenue-producing departments. The step-down method uses cost drivers to allocate indirect cost pools to all other cost pools one by one until all indirect costs have been allocated to revenue-producing departments.

4.4 Patient Service Cost Allocation Methods

For some uses of cost information, cost allocation down to the level of the department is sufficient. Understanding the total costs associated with inpatient, outpatient, and ancillary services permits benchmarking costs against other healthcare organizations and assessments of profitability. For other uses of cost information, the basic presentation of cost and profits by department reports does not sufficiently capture the detail necessary for managers to make changes. Inpatient and outpatient services lose money. Patients who were located in inpatient and outpatient settings use ancillary services that earned profits. What is the total amount of profits or losses earned by patients using different combinations of routine and ancillary services?

One option for determining costs at the patient level is to perform **microcosting**. Microcosting is the process of enhancing the financial accounting system to track, record, and report expenses at the level of the individual patient rather than at the level of the department, as is done with most direct costs, or at the level of the organization as a whole, as is done with indirect costs. Imagine an organization where each minute of each staff member's time is tracked on the basis of each patient treated. Radio-frequency identification technology could be applied to employee badges, and each minute of work in a patient room could be tracked as a cost to the patient. Microcosting could yield highly precise measures of patients' cost, at a very high cost to collect the data. True microcosting is not practical for health services applications.

An alternative to true microcosting would be to conduct a detailed cost analysis of an organization at one point in time and then to use that information for future time periods. For one day or two days, organizations could employ consultants to conduct detailed observations of how each staff person spends his or her time and how much of each administrative or general service was used by each department. Some large healthcare organizations will employ personnel who regularly perform such analyses for purposes of improving the efficiency of operations. Even periodic detailed analyses are not practical for most health services organizations.

To determine the full costs associated with patient services, a method of allocating department costs to patients must be selected and applied. The direct method is applied for allocation of costs to patients. There are no intermediate steps between the department and the patient, so alternatives, such as the step-down method, are not applicable. As with indirect cost allocations to departments, the direct method requires the designation of a cost pool and a cost driver. The cost pools for cost allocation to the patient are the collection of direct and indirect costs at the department level. For many ancillary services, such as the pharmacy, costs can be directly assigned to patients. Good patient safety practices dictate that all medications are tracked from the point of arrival at the healthcare organization to delivery to the patient. Similarly, medical devices and many other ancillary services are direct costs to the department and direct costs to the patient. Some ancillary services costs and all routine services costs are not directly assignable to individual patients. There would be no easy way to directly assign some portion of administrative services costs to individual patients. From the patient perspective, some ancillary services costs and all routine services costs are indirect costs.

There are two common cost drivers employed by healthcare organizations for allocating costs to patients: **relative value units (RVUs)** and **ratios of costs to charges (RCCs)**. RVUs require an independent measure of the value of services. The RCC method only requires information on the charges of services.

Relative Value Units

Use of relative value units as a cost driver for allocating costs from the department level down to the level of the individual patient is based upon the relative value of services provided. The essence of an RVU is that costs associated with providing services are compiled for all services, and costs for each service are measured against the average. For physician services, an RVU system was developed that measures physician time, physician office costs, and malpractice costs for every type of service provided by physicians (as demonstrated in Chapter 5, Exhibit 5.5). For outpatient services, an ambulatory payment classification (APC) system was developed. For inpatient services, a diagnosis-related group (DRG) system was developed.

Each system uses RVUs for services as measured at the national average level. The national average may be a reasonable method for paying for services. The national average does not necessarily apply to any particular healthcare organization and may not be a good measure for decision making. For example, the national average APC-based payment for a midlevel emergency department visit for an elderly patient might be $136.40. The payment of $136.40 should not be assumed to the cost of staff and resources for an emergency department visit at any particular facility. In fact, each emergency department would want to calculate its own costs and compare them to the $136.40 to determine whether it is earning a profit or experiencing losses on emergency department cases.

The development of RVUs for healthcare services is well beyond the scope of this book, but the essential idea is that organizations may perform detailed analyses, perhaps even microcosting, to determine the relative use of services. For example, consider the use of arthroscopy services on the hip. Arthroscopy uses a tubelike device to examine, diagnose, and treat a joint. With only a small incision, arthroscopy may yield faster healing than a large opening. Among the many arthroscopy services on the hip available on an outpatient basis is treatment to remove loose tissue that may restrict movement or cause pain. The routine outpatient costs of arthroscopy on the hip to remove tissue are 165% of the overall average cost. The ancillary services costs of arthroscopy on the hip to remove tissue are 195% of the overall average cost. A summary of this calculation is provided in Exhibit 4.6. For outpatient services, total costs are divided by the number of patients to yield an average cost:

$$\frac{\$31{,}223{,}460\ (\text{total costs})}{25{,}573\ (\text{number of patients})} = \$1{,}221$$

For a set of outpatient services that have an RVU of 1.65, the patient cost is the average cost multiplied by the RVU:

$$\$1{,}221\ (\text{average cost}) \times 1.65\ (\text{RVU}) = \$2{,}015$$

Similarly, for ancillary services, total costs are divided by the number of patients to yield an average cost:

$$\frac{\$84{,}629{,}368\ (\text{total costs})}{58{,}085\ (\text{number of patients})} = \$1{,}457$$

For a set of ancillary services that have an RVU of 1.95, the patient cost is the average cost multiplied by the RVU:

$$\$1{,}457 \times 1.95 = \$2{,}841$$

The total cost for a patient receiving this treatment is estimated as the sum of outpatient and ancillary services costs:

$$\$2{,}015 + \$2{,}841 = \$4{,}856$$

Exhibit 4.6 Direct allocation of department costs to services, arthroscopy of the hip to remove tissue, RVU cost driver

Service	Total Costs	Patients	Average Cost	RVU	Patient Cost
Outpatient	$31,223,460	25,573	$1,221	1.65	$2,015
Ancillary	$84,629,368	58,075	$1,457	1.95	$2,841
Total					$4,856

With more time and attention, it would be possible to determine the RVUs for each component of routine services and the ancillary services cost involved with this service. Each type of staff member could be monitored to determine RVUs associated with salaries. Each type of lab test and X-ray could be monitored to determine RVUs associated with ancillary services. RVUs that are developed on the basis of detailed examinations of historical costs of services can lead to very accurate estimates of the cost of services for a patient. The challenge with the use of RVUs is the time and effort required to develop the RVU measures. When time and other resources are not available, the ratio of cost to charges may be used in place of RVUs.

Ratio of Costs to Charges

Use of the ratio of costs to charges as a cost driver for allocating costs from the department level down to the level of the individual patient is based upon the relative charges of services provided. The essence of an RCC is that charges associated with providing services are compiled for all services, and the charge for each service is measured against the average cost of all services. As a practical matter, the chargemaster presents the charge for each service, and therefore the data for RCCs is readily available. As a further practical matter, the ratio of cost to charges can use net patient revenues rather than charges.

For the same example of arthroscopy services on the hip, the allocation of costs on the basis of the RCC requires data on total charges, or net patient services revenue. As presented in Exhibit 4.7, the RCC for outpatient services is 1.16:

$$\frac{\$31{,}223{,}460 \text{ (total costs)}}{\$26{,}938{,}440 \text{ (total net revenues)}} = 1.16$$

and the RCC for ancillary services is 0.83:

$$\frac{\$84{,}629{,}368 \text{ (total costs)}}{\$101{,}961{,}002 \text{ (total net revenues)}} = 0.83$$

For a patient receiving the arthroscopy services, charges may be $2,500 for the routine service and another $2,500 for the ancillary service. Multiplying the RCC and the patient charge yields the average cost of the service.

For outpatient services, the RCC is multiplied by the charge to yield a patient cost:

$$1.16 \times \$2{,}500 = \$2{,}898$$

For ancillary services, the RCC is multiplied by the charge to yield a patient cost:

$$0.83 \times \$2{,}500 = \$2{,}075$$

The total cost of a patient is the sum of outpatient and ancillary services costs:

$$\$2{,}898 + \$2{,}075 = \$4{,}973$$

Exhibit 4.7 Direct allocation of department costs to services, arthroscopy of the hip to remove tissue, RCC cost driver

Service	Total Costs	Total Net Revenues	RCC	Patient Charge	Patient Cost
Outpatient	$31,223,460	$26,938,440	1.16	$2,500	$2,898
Ancillary	$84,629,368	$101,961,002	0.83	$2,500	$2,075
Total					$4,973

With more time and attention, it is possible to determine the RCCs for each detailed component of cost involved with every service. Each component of routine outpatient services may have a unique charge, as would each type of ancillary service. With highly detailed data, each line item on the patient bill could be matched with the RCC for the department providing the service, permitting calculation of the cost of treatment for each patient.

The challenge with the use of RCCs is the nature of the relationship between costs and charges. If charges are based upon historical cost, then RCCs may represent a very accurate cost driver. If charges are based upon negotiations that do not reflect the costs at an organization, RCCs may represent an inaccurate cost driver. In one particular case of arthroscopy services at Middaugh, estimates of costs at the patient level based on RVU and RCC cost drivers are very similar. RVU and RCC cost drivers may yield similar results, but there is no guarantee. Comparisons of costs measured by RVU and RCC cost drivers may yield very different results.

Use of RVU cost drivers yields more accurate measures of cost and requires the development of RVUs, which can be a time-consuming and expensive process. RCCs yield less accurate measures of costs and are easy to prepare. The choice between using RVU and RCC as cost drivers for allocating department level costs down to the level of patients will depend upon the need for accurate measures and the availability of time and money to conduct the analyses.

Activity-Based Costing

Going beyond traditional accounting systems, some organizations employ **activity-based costing (ABC)** as a means to gain more precise information. ABC is a method of determining costs for departments and services that use detailed information on the production process (or time spent by staff) to model the cost process. To be more precise, ABC is not an accounting system in a traditional sense. An ABC system would not be used as the basis for preparation of financial statements. It does not depend upon methods of allocating costs to

departments and development of cost drivers. Rather, ABC creates an economic model of the activity in an organization and applies dollar values to the activities.

In the example of Middaugh United Hospital, a model of administrative services might be created. Administrative services include, among other functions, financial management, human resources management, information systems, marketing and public relations, security services, and senior management. For each function, a model of what personnel do on a daily basis may be created, with attention being given to the time that they spend associated with the activities of the patient services departments. For example, a model of human resources management would detail the steps taken by personnel in human resources, much of which involves interactions with departments for hiring, training, and providing benefits to staff. By creating a model and tracking the costs associated with activities, many indirect costs associated with human resources could be more appropriately classified as directly assignable costs to departments.

From the Front Lines

At a laboratory, regulations require employees to use respirators to protect them from health hazards. If a manager is tasked with reducing costs to these respiratory services, two approaches could be utilized.

From a financial accounting system perspective, costs for respiratory services include: $320,000 for salaries, $120,000 for equipment, and $245,000 for supplies and other resources. The total cost is $685,000. For 1,200 employees, the average cost per person is $571. From an ABC perspective, respiratory services include $206,550 to schedule and train employees, $199,000 to certify respirators, and $279,450 to maintain and distribute respirators.

The financial accounting view would indicate only which items could be reduced. The ABC view shows activities that can be changed, which would then be translated into items to be reduced.

Source: Brandt, Levine, Smith, Ettinger, & Gallimore (1998).

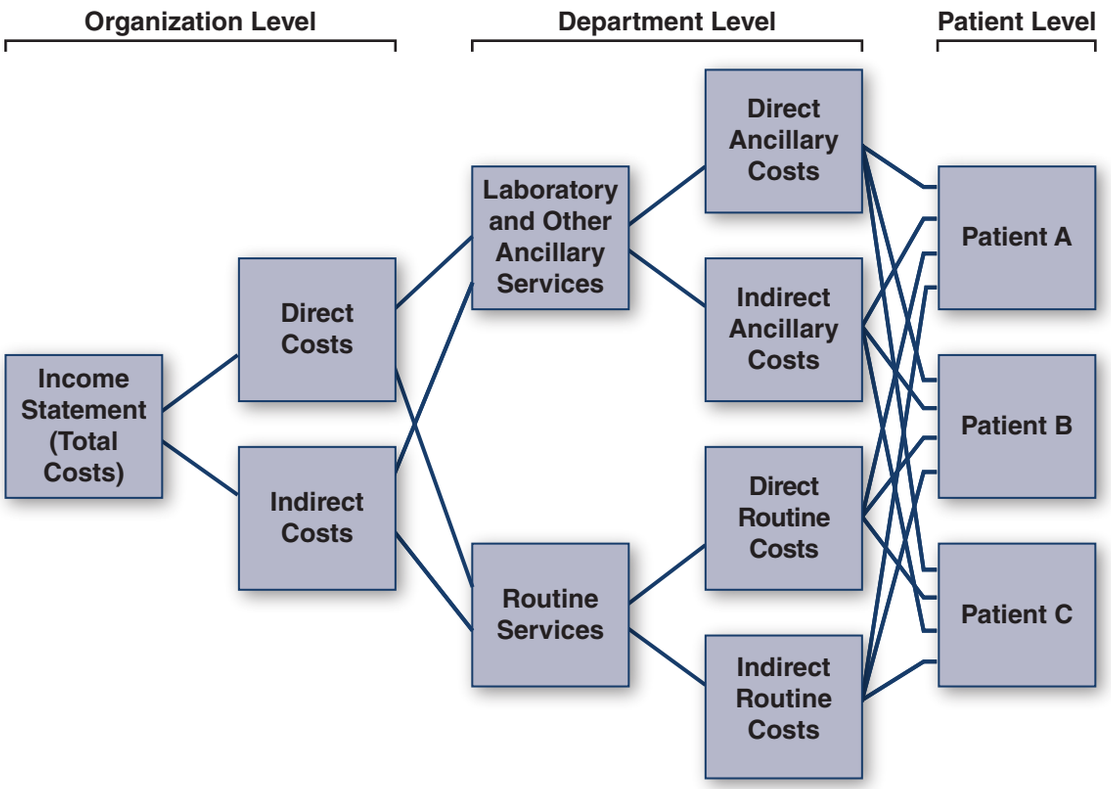
Even with the general description of the steps taken in the department of human resources, it is not hard to imagine that creating models of services can become very complicated. Moving beyond the use of ABC for modeling costs within patient services departments can become even more complicated. It is not surprising that only a very small percentage of healthcare organizations have attempted to implement ABC (Emmett & Forget, 2005). Advances in software to facilitate ABC and the use of expert managers' understanding of processes rather than surveys and direct observation may lower the time and cost involved with using ABC in the future (Kaplan & Anderson, 2007). For the present, using direct and step-down allocation methods is the norm for determining full costs at the level of the department in healthcare organizations.

Putting It All Together

Now that we've covered each step in the cost allocation process, let's look at Figure 4.1. As you will recall, the starting point for all cost analyses is the income statement. The first step is the separation of direct and indirect costs from the perspective of individual departments. The second step is the assignment of direct costs to the appropriate department. For a very simple organization with only two departments, some of the direct costs can be assigned to each department. The third step is the allocation of indirect costs to departments, which may be performed using the direct method or the step-down method. The fourth step is the separation of direct and indirect costs from the perspective of individual patients treated. The final step is the assignment of direct costs and the allocation of indirect costs to patients. The process of allocating department level indirect costs to patients may be performed using

the RVUs or RCCs. RVUs permit a more accurate allocation of costs and require substantial times and resources to prepare. RCCs are readily available and may yield inaccurate results.

Figure 4.1: Summary of cost allocation from the organization level to the department level to the patient level



The complexity involved in determining the cost of care provided to patients is made clear in Figure 4.1. For a seemingly simple case of an organization with only two departments and only three patients, there are two levels of assessment of direct versus indirect costs and two points at which indirect costs have to be allocated. For large organizations with 20 or more departments and, literally, tens of thousands of patients each year, the process is highly complex. In practice, one would never attempt to allocate department costs to actual patients. Instead, patients with similar illnesses or similar types of treatments would be grouped together. This may limit the number of patient groups to few more than a dozen for a skilled nursing facility, but there are still hundreds of groups for a hospital.

For Review:

1. What is the key difference between using RVUs and RCCs?
   RVUs and RCCs are both cost drivers to allocated indirect department cost pools to patients. RVUs require calculation of new measures of the relative costs among services within a cost pool. RCCs use relative charges among services as the measure of relative costs.

Summary & Resources

Chapter Summary

Having an understanding of the full costs associated with operating a department of a healthcare organization is important for good decision making. Since personnel staffing and most resources are used in the provision of patient services at the department level, costs must be known at the department level. Knowing which departments generate profits and which generate losses can aid management by focusing their attention and enabling decision making.

Determining the costs of departments involves the use of financial accounting systems. Many of the expenses associated with staff, supplies, and equipment used in a department will be designated as direct costs to the department within a traditional financial accounting system. However, many expenses within traditional financial accounting systems are assigned to nonpatient services departments, such as administration. Expenses associated with administration and other nonpatient services departments are classified as indirect costs, which are also called overhead costs.

To determine the amounts of indirect costs that associated with each patient services department, a cost allocation method must be selected and employed. The direct allocation method and the step-down allocation method are commonly used by healthcare organizations. The direct method is somewhat simpler than the step-down method and generates intermediate results that make it easy to explain. The step-down method provides somewhat more precise estimates of total costs and is required for preparation of the Medicare Cost Report. However, the step-down method and its derivatives are more complex and less easy to explain to department managers.

For both the direct allocation method and the step-down allocation method, the cost pools to be allocated are the indirect costs for the organizational as a whole. The cost drivers are measures at the department level that reflect the relative use of resources. The cost drivers are generally the same for both direct and step-down allocations.

Going further to determine the cost of treating patients, costs at the department level must be separated into direct and indirect costs from the perspective of patients. Direct costs can be assigned to patients. To determine the allocation of indirect costs that are associated with patients, a cost allocation method must be selected and employed. The method that is employed is essentially the direct method. Attempting a step-down allocation process across individual patients would be complex and not meaningful. For allocating department level indirect costs to patients, there are two alternative cost drivers, relative value units and ratios of costs to charges. RVUs permit a more accurate allocation of costs and require substantial times and resources to prepare. RCCs are readily available and may yield inaccurate results.

There are even more sophisticated methods for cost determination, such as microcosting of services and activity-based costing of activities that might be employed to provide more accurate estimates of costs. At present, the time and effort required to prepare more sophisticated analyses have been justified by just a few healthcare organizations.

Discussion Questions

1. Many healthcare organizations use the direct method and many use the step-down method of cost allocation. If the organization should have highly accurate cost information, which measure should be used?
2. Many healthcare organizations use RVUs and many use RCCs to determine the costs of treating specific sets of patients. If the organization should have highly accurate cost information, which measure should be used?
3. There are two levels of cost allocations required to go from the income statement of an organization down to the costs of a specific patient. How comfortable are you in the accuracy of the costs of patient services provided by healthcare organizations? What would you do to assure accurate cost determination?

Exercises

1. Medical Management Group owns 17 solo practice physician clinics (with 17 physicians) and 3 multispecialty clinics (with 8 physicians each). To allocate overhead to each type of practice, they allocate administrative costs on the basis of direct costs and allocate central supply costs based on the number of patient visits.

Cost Center	Direct Costs	Patient Visits
Administration	$1,189,000	
Central supply	$3,210,000	
Solo practice offices	$12,767,000	160,000
Multispecialty clinics	$23,964,000	300,000
Total	$41,130,000	460,000

   a. Using the direct method, what are the total costs for operating the solo practice offices and multispecialty clinics?
   b. Using the step-down method, what are the total costs for operating the solo practice offices and multispecialty clinics?
   c. What are the differences in the costs per patient using the direct method versus the step-down method?

2. Medical Management Group provides services to patients at varying levels of severity of illness. At the solo-practice clinics, 90,000 of the patient visits are associated with mild, intermediate, or severe levels of patient illness. For these 90,000 patients, total costs are $8,000,000, and total charges are $11,575,000.

Illness Level	Charge per Patient	RVU per Patient	Patients
Mild	$90	0.8	35,000
Intermediate	$145	1.1	40,000
Severe	$175	1.5	15,000
Total	$11,575,000		90,000

   a. Using RVUs as cost drivers, what are the costs per patient and profit per patient for each illness level?

b. Using RCC as the cost driver, what are the costs per patient and profit per patient for each illness level? Note that there will only be one RCC for all illness levels because there is only one total cost to be divided by total charges.
c. Which illness level is most profitable to treat?

Key Terms

activity-based costing (ABC) A method of determining the total costs for departments and services that uses detailed information on the production process (or time spent by staff) to model the cost process.

cost driver A statistical measure that reflects a sensible and meaningful way in which indirect costs are allocated to revenue-producing departments to yield a measure of total costs.

cost pool A collection of direct or indirect costs based upon information from a financial accounting system. Indirect cost pools are allocated to direct cost pools using a cost driver.

direct costs Expenses that can be clearly assigned to specific patient service departments, such as the expense associated with staff that work in a department.

direct method A method of determining the total costs for departments that uses available measures of service to allocate indirect costs. The direct method allocates indirect costs to departments directly, with no intermediate steps.

full costs The sum of direct costs and indirect costs.

indirect costs Expenses that cannot be clearly assigned to specific patient service departments due to limitations of the accounting system or due to the nature of the expense, such as general administration expenses.

microcosting The process of enhancing the financial accounting system to track, record, and report expenses at the level of the individual patient rather than at the level of the department.

overhead costs Expenses that are recorded as indirect costs to patient care departments and expenses that are not associated with patient care activities.

ratios of costs to charges (RCCs) Cost drivers for allocation of department costs to patients, based on the analysis of the charges or net revenues of a service relative to all other services.

relative value units (RVUs) Cost drivers for allocation of department costs to patients, based on the analysis of the costs of a service relative to all other services.

step-down method A method of determining the total costs for departments that uses available measures of service to allocate indirect costs. The step-down method allocates indirect costs to patient service departments, with intermediate steps involving nonpatient service departments that yield somewhat more precise cost allocations than the direct method.

Suggested Websites

- The Center for Medicare and Medicaid Services' reimbursement sections (https://www.CMS.gov) provide references on cost reporting methods.