Analyzing the Cost of Delivering Value Added Pharmacy Services
by
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Whether you’re a price maker trying to decide what price to set for your service, or a price taker trying to decide whether to accept a price that has been set by a payer, you need to know your cost of delivering the service to make a good decision. This chapter provides a step-by-step guide to analyzing the cost of delivering value added services from a community pharmacy.

What is the ‘Cost of Service Delivery’?

For the purpose of this discussion, the cost of service delivery is defined as the operating costs incurred by the practice to deliver one unit of a specialized pharmacy service to a patient. While each service is different, for most services a “unit” typically corresponds to a patient encounter or similarly discrete episode of care.

The costs we are interested in include:

- salary, wages and benefits of all personnel involved in delivering the service;
- all non-salary direct costs such as special education or training, information resources and marketing / promotion activities;
- any materials or supplies routinely consumed during delivery of the service;
- the cost of equipment used to support the service, and;
- a fair share of overhead costs

At this point in our discussion, a quick review of some basic principals of cost accounting may be helpful.

The Nature of Operating Costs

Operating costs may be broadly divided into one of two types; direct or indirect. **Direct costs** are those that are directly traceable or attributable to (i.e., caused by) the service in question. As such, direct service costs would not be incurred by the pharmacy if the service were not being performed.

Direct service costs may be further distinguished as either **variable** or **fixed**. Importantly, this distinction is not based on whether the cost varies *per se*, since all costs in a pharmacy will vary over time. Rather, what makes a cost variable in the accounting sense is that it varies in direct proportion to the volume of service being delivered.

This concurrent variance typically results from a causal relationship that exists between the cost in question and delivery of the service. A familiar example of a direct variable cost in community pharmacy is the cost of prescription vials. The cost of this resource represents a direct variable cost of dispensing prescriptions because one of each is typically consumed each time a prescription is dispensed. Similarly, any materials or supplies that are routinely consumed during the delivery of a service would be considered a direct variable cost of service delivery.
In contrast, direct fixed costs results from any resource in the practice that is specifically involved in the delivery of the service but the cost of which does not vary in proportion to volume. Referring once again to our prescription dispensing example, the most significant direct fixed cost of dispensing a prescription is personnel cost, especially the pharmacist. Since pharmacy staff who are scheduled to work on a particular day will cost the practice the same amount of money whether an additional prescription is dispensed that day or not, their cost (i.e., wages, benefits, etc.) are considered to be a fixed cost of dispensing. In service delivery, the cost of capital equipment used to deliver the service would be an example of a fixed cost.

**Indirect costs** are those that would be incurred in the practice even if the service were not performed. In cost accounting, a fair share of these “overhead” costs must be absorbed by each revenue-producing activity in the business. This is accomplished by allocating indirect costs in the practice to each activity using some reasonable criterion. In most cases the criterion used to allocate indirect costs to a service is based on one of two rules: the amount of space the service occupies during operating hours, or; the proportion of total sales the service accounts for in the business.

The distinction between variable and fixed costs is more than just accounting semantics. Understanding this difference is essential to appreciate the full implications of any price-setting or price-taking decision the manager may make because it is linked to two venerable concepts, breakeven analysis and contribution margin.

As we have already discussed, the full cost of delivering a service is equal to the sum of all variable and fixed costs. That is:

\[ \text{Total Cost} = \text{Variable Costs} + \text{Fixed Costs} \]

Naturally, just as in dispensing prescriptions, if sales revenues do not exceed total cost then the pharmacy does not make a profit.

One way to evaluate the economic implications of setting or accepting a particular price for a service is to perform a [breakeven analysis](https://en.wikipedia.org/wiki/Breakeven_analysis) to determine the volume at which total sales revenues for the service equal total costs at any given price. A breakeven analysis provides the manager with a sales volume goal that the practice must meet at a given price during a given time period (usually a year) in order to turn a profit. This, in turn, provides insight into whether the proposed price for the service is reasonable given the its cost of production and the likely demand by patients and/or payers.

But just as in the prescription business, this simple calculation does not tell the whole story. Why? Because in the algebra of pricing decisions all costs are not created equal. Variable costs carry more weight due to a concept called contribution margin.

The **contribution margin** for a service is calculated by deducting the variable costs of delivering the service from sales revenue. If the resulting value is negative it tells the manager the proposed price for the service does not cover the cost of resources that are actually consumed in delivering the service, much less the direct fixed costs and overhead. Setting or accepting a price for a
service that does not cover the direct variable costs of delivering it would be considered financially irrational unless the service were strictly promotional or altruistic.

If the difference between sales and variable costs is positive, it indicates the amount of revenue that can “contribute” to meeting the remaining fixed costs of maintaining the practice and, hopefully, produce a profit. That is:

\[
Sales – Variable Costs = Contribution Margin
\]

and

\[
Contribution Margin – Fixed Costs = Net Income
\]

An example will help to illustrate these important concepts.

Example

ABC Pharmacy is a full service independent community pharmacy that has developed a service to assist patients better manage their elevated weight and cholesterol. The service, Total Lipid Care (TLC), is delivered during a series of 5 patient encounters and includes a blood lipids assessment and a pharmacist consultation during each visit. The management decision that needs to be made is: What price should the pharmacy set (or accept) for the TLC service?

As a previous chapter on marketing value added services observed, establishing a pricing strategy involves more than just knowing your costs. However, it is impossible to establish a rational pricing strategy if you do not know how much a product or service costs to produce, so performing a cost analysis is an important first step in pricing.

So then, what more do we need to know about this service to perform an accurate cost analysis?

Personnel

Personnel time is typically the single greatest contributor to the cost of delivering a pharmacy service. It is also the cost that is easiest to overlook or misjudge and is often the most difficult to control. As a result, the importance of measuring it accurately and managing it efficiently cannot be over emphasized.

An accurate cost analysis requires that personnel expense is inclusive of staff time that is dedicated to delivering the service. Importantly, this includes time spent preparing for the encounter as well as any post-service time spent documenting or following up with the patient or the patient’s physician.

In our example, a typical TLC patient encounter requires approximately 30 minutes of staff time. Recognizing the importance of deploying his human resources efficiently, the manager of ABC Pharmacy has deployed staff to optimize workflow and minimize costs which are stated in the following table inclusive of all salary/wages and benefits:
An important difference between the cost of dispensing prescriptions and the cost of delivering a service is that personnel are considered to be a fixed cost in the former, but are more appropriately viewed as a variable cost in the latter. As we will see later in the chapter, this distinction can dramatically alter a manager’s pricing and contracting decisions for the service.

Materials and Supplies

‘Materials and Supplies’ include all resources that are physically consumed during the delivery of the service. Foremost among these in the TLC program is a test cassette used for the cholesterol analysis that is performed during each patient visit. In our example, ABC Pharmacy is able to purchase test cassettes from its vendor at a cost of $11.25 per cassette. Patients in the TLC program are also provided with a diet diary during their initial visit and asked to keep a record of their eating habits. The pharmacy’s cost of printing the diary is $8.00 and it is used throughout all 5 encounters in the program for a per encounter cost of $1.60. During each TLC session the pharmacist also distributes worksheets printed in the pharmacy from a commercially available database to reinforce key aspects of cholesterol and weight control. An average of two worksheets are used per session at a cost of $0.50 each.

<table>
<thead>
<tr>
<th>Material</th>
<th>Units per Encounter</th>
<th>Cost per unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test cassette</td>
<td>1</td>
<td>$11.25</td>
<td>$11.25</td>
</tr>
<tr>
<td>Diet Diary</td>
<td>0.2</td>
<td>8.00</td>
<td>1.60</td>
</tr>
<tr>
<td>Worksheets</td>
<td>2</td>
<td>0.50</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$13.85</td>
</tr>
</tbody>
</table>

So, in direct variable costs alone we have already determined that the cost of delivering one patient encounter of the TLC program at ABC Pharmacy is slightly more than $29.

Equipment

For many pharmacy services there is no capital equipment needed to provide the service beyond that which would already be present in a typical community pharmacy such as the pharmacy’s computer system. For our example here, ABC Pharmacy had to purchase two pieces of equipment to support the TLC service; a high quality scale for $500 and a cholesterol testing device for $2,000. How then do we allocate a portion of these fixed costs to each patient encounter in the TLC program? The answer is, it depends.

If the manager elects to expense the total cost of capital equipment in the current fiscal year then the entire cost ($2,800) could be considered an operating expense and would be divided equally
among the number of TLC patient encounters that occur during that year. Alternatively, one or both pieces of equipment could be expensed incrementally via depreciation over several years.

**Depreciation** is the accounting procedure used to recognize the loss in the value of an asset as it wears out or is used up over time. The asset’s loss of value during a particular accounting period (usually a year) is represented as a depreciation expense. To calculate depreciation expense we need to know three things:

- Acquisition Cost (C)
- Useful Life (N)
- Residual Value (R)

Although there are different approaches to calculating depreciation expense, the most common is called “straight line” depreciation because it assumes the asset loses value at a constant rate over time. While this assumption may not be technically accurate, it is usually close enough and has the additional advantage of making the calculation simple. Using the straight line method, the annual depreciation expense (D) is calculated as:

\[
D = (C - R) \times \frac{1}{N}
\]

In our example, the acquisition cost (C) of the scale was $500 and we will assume it has a useful life (N) of 10 years with a residual value (R) of $100 at the end of its useful life. The acquisition cost of the cholesterol testing device was $2,000 and we will assume a useful life of 5 years with a residual value of zero. Plugging these values into our equation above, the annual depreciation expense for capital equipment used to support the TLC program is:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Acquisition Cost (C)</th>
<th>Useful Life (N)</th>
<th>Residual Value (R)</th>
<th>Annual Depreciation (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighing Scale</td>
<td>$500</td>
<td>10</td>
<td>$100</td>
<td>$50</td>
</tr>
<tr>
<td>Cholesterol Testing Device</td>
<td>$2,000</td>
<td>5</td>
<td>$0</td>
<td>$400</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$450</strong></td>
</tr>
</tbody>
</table>

Unlike variable costs, the per-unit impact of fixed costs is directly affected by volume. The impact that a $450 annual depreciation expense has on the cost of delivering each “unit” of the TLC program depends on the annual volume of patient encounters we expect. If ABC Pharmacy averaged 5 TLC patient encounters per week, depreciation expense would add only $1.73 to the cost of each patient encounter ($450 ÷ 260). Alternatively, if the pharmacy averaged only one encounter per week, depreciation expense would add $8.65 to the cost of service delivery.

The volume-sensitive nature of fixed costs becomes increasingly important as the fixed costs needed to deliver the service increase. It should go without saying that this relationship reinforces the need for good information on existing or anticipated market demand for the service. The annual direct fixed costs of delivering the TLC service must be covered whether ABC Pharmacy delivers 1 patient encounter during the year or 1,000. This is also an important strategic consideration when selecting which specialized services to implement in a community pharmacy. If the volume is expected to be low - or is uncertain, a service that requires a
substantial investment in equipment may not be the best initial choice unless the needed equipment can be rented or leased while building up the volume. For our example we will assume that ABC Pharmacy anticipates an average of 2 patient encounters a week thereby adding $4.33 in equipment cost to each encounter.

Other Direct Costs

There are a variety of additional direct fixed costs that may be involved in supporting a particular pharmacy service such as special education or training for staff. An example would be a certificate program in cholesterol management such as those offered through some state and national professional associations. Similarly, the service may require the pharmacy to carry specialized software or information resources that would not otherwise be resident in the pharmacy. Another direct cost that is all too commonly overlooked or underestimated is the cost of promoting the service, including staff time spent explaining the service to patients or detailing area physicians.

The non-salary direct costs required to support the TLC service are:

<table>
<thead>
<tr>
<th>Other Resources</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Certificate Program in Cholesterol Management</td>
<td>$125</td>
</tr>
<tr>
<td>Electronic Patient Education Worksheet Database</td>
<td>$150</td>
</tr>
<tr>
<td>Marketing and Promotion</td>
<td>$300</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$575</td>
</tr>
</tbody>
</table>

Distributing these other fixed costs across the 104 anticipated patient encounters adds $5.53 to the cost of delivering the service. Once again, this per-unit cost will fluctuate up or down in direct relation to the actual volume of TLC encounters that are delivered during the year.

Overhead Costs

As we discussed at the beginning of this chapter, full cost analysis requires that every revenue-generating activity in the business absorb its fair share of general overhead expenses that are incurred to keep the business open. These costs include such things as rent (or depreciation if the building is owned), utilities, insurance, legal and accounting, maintenance, etc. Each of these indirect fixed expenses is allocated to the service using a reasonable criterion that best represents how the cost is incurred.

Keeping our example simple, we will use the proportion of floor space that is occupied by the TLC service during operating hours as our criterion for allocating overhead. The total floor space of ABC Pharmacy is 4,000 sq. ft and the office in which TLC is delivered is 120 sq. ft., representing .03 of the total. The pharmacy is open 50 hours a week. Since each patient encounter requires 30 minutes and we anticipate an average of 2 encounters per week, the office will be occupied by the TLC service for only 2% of total operating hours.
<table>
<thead>
<tr>
<th>Overhead Item</th>
<th>Annual Cost</th>
<th>Service Area Total Area</th>
<th>Service Hrs Total Hrs</th>
<th>Allocated to TLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>$50,000</td>
<td>.03</td>
<td>.02</td>
<td>$30.00</td>
</tr>
<tr>
<td>Utilities</td>
<td>9,500</td>
<td>.03</td>
<td>.02</td>
<td>5.70</td>
</tr>
<tr>
<td>Insurance</td>
<td>12,500</td>
<td>.03</td>
<td>.02</td>
<td>7.50</td>
</tr>
<tr>
<td>Other</td>
<td>5,000</td>
<td>.03</td>
<td>.02</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$46.20</strong></td>
</tr>
</tbody>
</table>

The resulting $46.20 in overhead costs allocated to the TLC program must then be equally distributed across all patient encounters (104) adding another $0.44 to the per-unit cost of service delivery. It is important to note that this modest impact of overhead reflects the decision of the manager to utilize flexible space in the pharmacy to deliver the TLC program. If this program were the only activity the 120 sq. ft. office were used for then the impact would be very different as the value of Service Hrs ÷ Total Hrs would be 1.0 instead of .02.

Adding up our costs we find the total cost of delivering one patient encounter of the TLC program from ABC Pharmacy is:

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Cost</th>
<th>% of Total</th>
<th>Type of Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>$15.25</td>
<td>38.7</td>
<td>Variable</td>
</tr>
<tr>
<td>Materials &amp; Supplies</td>
<td>13.85</td>
<td>35.2</td>
<td>Variable</td>
</tr>
<tr>
<td>Equipment</td>
<td>4.33</td>
<td>11.0</td>
<td>Fixed</td>
</tr>
<tr>
<td>Other Direct</td>
<td>5.53</td>
<td>14.0</td>
<td>Fixed</td>
</tr>
<tr>
<td>Overhead</td>
<td>0.44</td>
<td>1.1</td>
<td>Fixed</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$39.40</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Our analysis tells us that the full cost of delivering one patient encounter of TLC at ABC Pharmacy is $39.40. So, we know the pharmacy must charge more than that if it wishes to make a profit on TLC. But what else does our analysis tell us?

As is commonly the case, the single biggest cost of TLC is personnel, particularly the pharmacist’s time which accounts for $12.50 or 31.7% of the total. Looking for efficiencies, the manager may consider delegating additional responsibilities to supportive personnel if possible. The pharmacy may also consider implementing a community pharmacy residency program. Using a pharmacy resident in place of a staff pharmacist could cut the cost of the pharmacist by 40-60% without threatening the quality of service provided.

Materials and supplies represent the next biggest cost. Especially prominent is the cholesterol test cassette at $11.25. If the manager were able to purchase test cassettes cheaper it would drive down the cost of delivering the service and allow more flexibility in pricing.

It is important to note that personnel and materials/supplies are both variable costs. It would therefore be difficult to justify setting or accepting a price less than $29.10, just as it would be to accept a third party prescription program that failed to cover the drug product and the direct variable costs (vials, labels, etc.) of dispensing. But would it ever be appropriate to set or accept
a price that covered the direct variable costs but not all costs? The answer is, maybe. Why? Just as in prescription pricing and contracting, the reason is linked to the concept of contribution margin.

Just as in prescription dispensing, the fixed costs of delivering a service will be incurred – and must be covered – irrespective of the volume that is actually delivered. So, if the pharmacy is constrained from charging the full cost due to pricing by competitors or a fixed-fee third party contract, it may be acceptable in some cases to accept a reimbursement rate that covers variable costs and contributes at least something to meeting the outstanding fixed costs. Naturally, if the pharmacy’s entire book of business consists of contracts that pay below the full cost of delivering the service it cannot hope to make a profit. However, in selected instances it may be a defensible strategy.

Breakeven Analysis

As discussed above, volume is an important consideration in pricing a service because it is an important determinant of cost. Given our cost analysis for TLC, a question the manager might ask is, “how much volume do I need to make a profit at a given price?” To answer this question we must perform a breakeven analysis, where:

Sales – Variable Costs – Fixed Costs = 0

As the name implies, the breakeven point is that volume at which the pharmacy begins to make a profit. Using our example above, let’s assume the manager set the price for TLC at $50 per encounter. How many encounters would the pharmacy need to deliver in a year in order to breakeven?

Plugging values from our cost analysis into the above equation we get:

$50N - $29.10N – ($10.30 x 104) = 0

Solving for our volume (N), we find:

$20.90N = $1071.20

and

N = 51.25

So, at a price of $50 per encounter, ABC Pharmacy must deliver 52 patient encounters per year to breakeven on the TLC service. Assuming the pharmacy averages 2 encounters per week, it will take 26 weeks of business each year to begin turning a profit on the TLC service at a price of $50.

In this way, breakeven analysis provides the manager and staff of ABC Pharmacy with a sales goal for the TLC service. Naturally, if demand for the TLC service were sufficiently high and
competition low, the manager may be able to increase the price and the breakeven point would be achieved quicker. Alternatively, the manager could examine the delivery costs of the service for possible ways to reduce costs and deliver the service more efficiently and/or price it more competitively.

Conclusions

There are many reasons why community pharmacies implement value added services and profitability may not be the most important consideration. Still, good management requires that the cost implications of each product or service delivered from a business is known. Analyzing the cost of service delivery is simply another tool the manager may use to evaluate a service offering from the pharmacy and/or determine how best to price and deliver it.

References


