Unit Cost of Counseling and Patients' Length of Stay in a Residential Drug Treatment Setting

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Abstract

Background: Many published reports on cost of counseling give a fixed cost per hour of service. These estimates may be flawed.
Aims of the Study: The purpose of this study is to show, by way of an example, how cost of an hour of counseling depends on the nature of the patient, in general, and length of the patient's stay, in particular. Even though the health care professional provides the same hour of work, the cost of the hour is different for short-stay and long-stay patients.
Methods: We identified 5-short and 5 long stay patients in a residential treatment program. For each group, we asked the counselors to review the medical records and measure the patients' utilization of various service units. We estimated the cost of a unit of service by dividing cost of an average patient by the program utilization of short and long-stay patients.
Results: The cost of an hour of counseling for long stay patients was 2/3 less than the cost of short-stay patients. Similar large changes in unit cost of treatment were observed for cost of group counseling or other components of substance abuse treatment.
Discussion: Our data was limited to one case study and may not indicate similar patterns in other treatment programs. The paper suggests that methods of studying cost of treatment should be adjusted to reflect case mix of patients and their expected length of stay.
Implications for Health Policies: Our analysis shows that higher rates should be set for patients at risk for short stays; conversely lower rates should be set for patients likely to complete treatment. Without adjusting the rate for the case mix of patients, health care institutions have an incentive to avoid the difficult cases and concentrate on long stay cases.
Implications for Further Research: A number of instruments that measure severity of illness or difficulty of treatment can be used to anticipate patients' length of stay. Then the rate for units of treatment can be set based on patients' expected length of stay. This paper presents a questionnaire that can be used to collect cost data and estimate cost per unit of treatment adjusted for expected length of stay.

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Introduction

In setting per unit rates for reimbursement of substance abuse treatment, e.g. when Medicaid sets a rate per hour of counseling, it is important that the rates are set fairly. One would appropriately expect that the costs of treatment would vary considerably depending on who, meaning which profession, is providing the counseling and which setting, meaning outpatient or residential setting, is used. What is more surprising is that cost for the same provider within the same program fluctuates depending on the nature of the patients they are treating. This paper discusses the influence of patient's length of stay on estimates of unit cost of treatment and provides a procedure for estimating more accurate unit costs of treatment.

This paper focuses on cost of providing treatment and not cost of treatment to employers[1] or the society, both of which have been reviewed elsewhere.[2-4] The focus here is on cost of treatment from the perspective of insurers (Medicaid program, managed care contractors, etc.) who need to price treatment programs. In addition, the focus of this paper is on helping managers of treatment programs who need to benchmark their efficiency and to negotiate contracts with managed care organizations.

The unit cost of treatment at a particular program can be estimated by dividing the total program cost by the number of patients served and the number of services used by these patients. French and colleagues provide a brief questionnaire that can be used to estimate unit cost of treatment and report cost of treatment for a number of programs.[5-7] Using a similar approach consulting organizations, such as Capital One, are working with the Center for Substance Abuse Treatment to put together large national databases of unit cost of treatment programs.[8]

In contrast to other health care interventions, patients often resist substance abuse treatment. Many do not seek treatment. Of the patients who make an appointment only about 1/3 actually show; and of those who do, many leave the treatment program before completing the entire course of treatment.[9] Because more intensive and more costly services occur early during the patient's stay (e.g., comprehensive assessment,

Table 1. Data available in program budgets

Category	Cost
Personnel	$ 639,231
Material	$ 135,221
Contracted	$ 22,012
Building	$ 124,283
Goods	$ 21,150
Occupancy	$ 71,878
Other	$ 36,796
Direct	$ 1,050,571
Indirect	$ 261,180

treatment planning, orientation, stabilization, management of treatment resistance), programs incur higher costs per episode of care for patients who have short stays. The approach proposed by French and colleagues does not adjust for patients' dropout rate and therefore it may misestimate the cost of programs that differ in attrition.

This paper proposes an alternative approach to estimating the unit cost of services by taking account of patients' drop-out rates. The paper starts with an example showing how much variability in unit cost of services can be expected if no adjustments are made. It then provides a step-by-step approach regarding how patients' observed or expected length of stay can be used to adjust unit cost of services. The paper also presents a brief questionnaire that can be used to assess the risk-adjusted cost of treatment.

Methods

Information was collected from one residential treatment program for substance abusing pregnant women and women with children. We estimated the unit cost of services by

allocating the organization's budget expenditures to the program. Before allocation, we adjusted the expenditures to include market value of donated or in-kind contributions.

The average cost per patient was calculated by dividing total cost by the number of patients served:

Cost per patient = Total cost / Number of patients served

Next, costs were allocated to various components of treatment. We assumed that care of any given patient consisted of the following 14 components: (i) Initial Assessment, (ii) Medical Examination, (iii) Psychological Examination, (iv) Individual Counseling, (v) Group Counseling, (vi) HIV testing and counseling, (vii) Medical Diagnostic Services, (viii) Housing and foodservices, (ix) Clinical case management, (x) Networking/outreach, (xi) Child care services, (xii) Staff education, (xiii) Client Transportation, and (xiv) Client education.

Costs were allocated to above 14 categories using two steps. First, costs were allocated to clinical, residential, childcare and management activities. Second, the management portion was divided among all activities, the clinical portion was divided among clinical activities and the residential portion was divided among residential activities. The basis for allocating personnel cost was the type of personnel involved. Building and occupancy costs were allocated by square footage. Material and supplies either fitted a particular category or were distributed equally among all categories.

Cost per unit for the 14 treatment components was calculated by dividing the cost per component by the number of units of service used by the patients.

Cost per unit = Cost per component / Number of units used

To illustrate how much length of stay may make a difference in unit cost of service, we repeated the above analysis but this time differentiated between units used by short and long stay patients. We selected five shortest and longest stay patients and asked counselors to estimate the number of units

Table 2. Components of treatment services

	Material	Contract	Building	Indirect	Others	Occupancy	Goods	Personel
Initial Assesment	$ 1,807	$ 55	$ 5,790	$ 4,884	$ 3,345	$ 4,993	$ 959	$ 2,698
Counseling	$ 1,807	$ 55	$ 5,790	$ 6,155	$ 3,345	$ 4,993	$ 959	$ 7,806
Group Counseling	$ 1,807	$ 55	$ 5,790	$ 15,305	$ 3,345	$ 4,993	$ 959	$ 44,613
Diagnostic Services	$ 5,832	$ 19,457	$ 5,790	$ 10,038	$ 3,345	$ 4,993	$ 959	$ 0
Housing & food	$ 111,174	$ 55	$ 71,971	$ 54,203	$ 3,345	$ 4,993	$ 4,359	$ 22,127
Case management	$ 1,807	$ 55	$ 5,790	$ 6,012	$ 3,345	$ 4,993	$ 959	$ 7,233
Outreach	$ 1,807	$ 55	$ 5,790	$ 5,186	$ 3,345	$ 4,993	$ 959	$ 3,912
Child care	$ 1,807	$ 55	$ 4,858	$ 97,714	$ 3,345	$ 4,993	$ 959	$ 377,029
Staff discussion	$ 1,807	$ 55	$ 5,790	$ 5,911	$ 3,345	$ 4,993	$ 959	$ 6,828
Transportation	$ 1,807	$ 2,065	$ 1,130	$ 9,577	$ 3,345	$ 21,948	$ 8,159	$ 67
Client education	$ 3,755	$ 55	$ 5,790	$ 46,195	$ 3,345	$ 4,993	$ 959	$ 166,918

Table 3. Cost per treatment service

	Cost for Average Stay
Patient length of stay (in days)	79
Initial Assessment	$ 104
Individual Counseling	$ 132
Group Counseling	$ 327
Medical Diagnostic Services	$ 215
Housing and food services	$ 1,158
Clinical case management	$ 128
Networking/outreach	$ 111
Child care services	$ 2,088
Staff discussion	$ 126
Client Transportation	$ 205
Client education	$ 987
Total	$ 5,582

Table 4. Cost per treatment component

	Units	Cost per unit
Initial Assessment	1 per patient	104
Medical Examination		
Psychological Examination		
Individual Counseling	12 hours	$ 11
Group Counseling	66 hours	$ 5
HIV testing and counseling		
Medical Diagnostic Services	1 per patient	$ 215
Housing and food services	79 days	$ 15
Clinical case management	11 hours	$ 12
Networking/outreach	6 hours	$ 19
Child care services	412 hours	$ 5
Staff discussion	10 hours	$ 12
Client Transportation	79 days	$ 3
Client education	248 hours	$ 4

of services each patient received during their stay. The counselors were asked to review the medical record to refresh their memory of the patients' utilization. On the basis of these data, we calculated two different unit costs of services, one for short stay patients and the other for long stay patients.

Results

Costs without Length of Stay Adjustments

Table 1 below describes the cost of the treatment program as available from analysis of the program budget.

The cost per patient was $5,582. **Table 2** shows the allocation of costs to each of the components of treatment service.

Costs associated with material, contract services, building, and other similar costs are shown on the top row of the **Table 2**. These costs were allocated to the various service components. The cost per treatment component is provided in **Table 3**.

Based on the utilization of services by an average patient, the cost per unit of service was calculated and is provided in **Table 4**.

Costs with Length of Stay Adjustments

To estimate the effect of length of stay, we distinguished between the utilization of services by the short and long stay patients. **Figure 1** shows the cost of one hour of counseling is reduced by about 2/3, when patients stay longer. The graph also shows similar changes for cost of group counseling. Similar large changes in unit cost of treatment were observed (but not presented in this paper) for cost of a day of residential treatment.

Discussion

In this paper, we have laid out a strategy of estimating unit cost of services based on patient's potential for leaving treatment programs prematurely. Data from a sample treatment program was used to show the sensitivity of unit cost of services to length of stay. We observed large changes in unit cost of treatment depending on the range of patient's length of stay. Our findings were limited to a single treatment program and may not be generalize to other settings and programs. Nevertheless, they provide an estimate of magnitude of differences that patient's length of stay can make in unit cost of treatment.

Patients differ considerably in units of service they use. Some patients stay a short time, use few services and then leave; others stay longer and use many more services. The unit cost per service will be higher for those patients who use few units of service because fixed costs are divided by a smaller number of units. Conversely, the unit cost per service will decrease as the length of stay increases because fixed costs are divided by a larger number of units. As the number of patients and their length of stay changes, the contribution of fixed cost to the cost of a unit of service changes.

If our findings are supported in future studies, there are a number of policy implications for setting rates for substance abuse treatment visits. First, payers who effectively encourage patients to stay the full course of treatment should pay less per treatment unit. For example, if court-ordered patients are more likely to stay the full course of treatment, then these patients will have a lower unit cost and therefore, it may be reasonable for courts to pay less.

Second, when estimating unit cost of treatment for the purpose of setting reimbursement rates, providers should calculate varying rates based on patient's expected length of
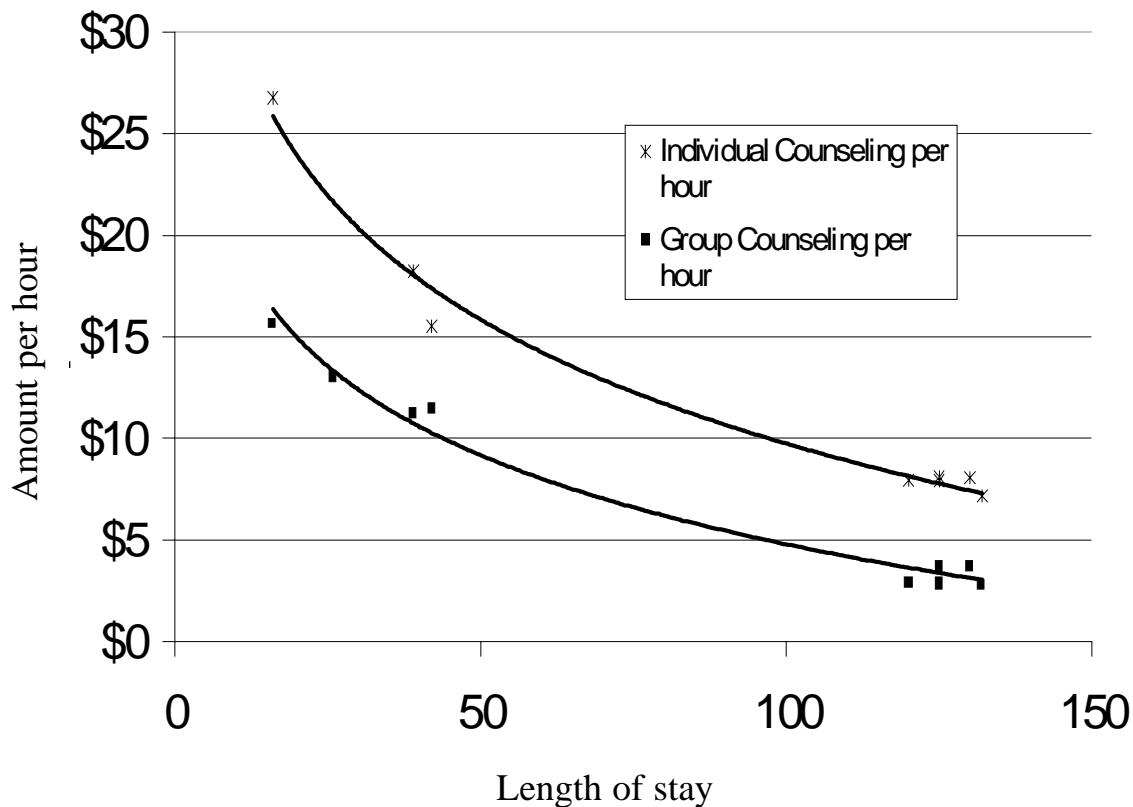
Figure 1. Sensitivity of cost of one hour of counseling to drop out rate

stay. Failure to do so will create an incentive for providers to select the easy to manage cases. Without such adjustments, reimbursement schemes that pay for units of treatment (e.g., Medicaid) would create incentives to focus on long stay (more profitable) patients and may in the long term reduce access for difficult-to-treat short stay patients.

In practice, it is not always reasonable to adjust the unit cost of treatment based on the dropout rate, as this information is not available on admission. Furthermore, the rate can be affected by the quality of care and may be manipulated by the provider, who wishes to maximize reimbursement. An alternative that can be used instead of observed patients' length of stay is the patients' severity of illness[10] and difficulty of treatment.[11] Patients who at admission are predicted to be easier to treat (e.g. patients previously in treatment, patients who are not violent, patients who have been ordered by the court to treatment) are expected to stay in treatment longer, thus, resulting in a lower unit cost per service. Patients predicted to be more severely addicted or more difficult to treat are expected to stay shorter period of time in treatment and will thus have a higher unit cost per service. If an instrument can be found to reasonably predict patients' length of stay, then this instrument can be used to set cost of treatment on admission to a program.

We have developed a tool useful in estimating unit cost of treatment adjusted for patients' expected length of stay (available through the first author). The first part of this survey is a questionnaire that can be used to estimate the total cost of a program and allocate program costs to various service components. Part two is based on Expected Treatment Outcome scale (ETOS), useful in predicting length of stay. Part two also includes survey items needed for review of services used by short and long stay patients.

In the District of Columbia in United States of America, we have proposed Medicaid rates for substance abuse treatment programs based on the model presented in this paper. As a result, three price levels were recommended corresponding to low, medium and high levels of expected length of stay. By allowing providers to bill Medicaid at different rates, we hope to reduce the risk of under or over compensation for care.

The need for additional research on fair pricing of treatment units remains. The calculation of the patient's length of stay can be based on historical trends or can be anticipated by a number of existing measures of difficulty of treatment and addiction severity. This paper does not address which instrument is best for predicting length of stay. Comparative studies are needed to establish which of the existing instruments can accurately predict patient's length of stay on admission.

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