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# **COST ANALYSIS TOOL**

**Simplifying Cost Analysis  
for Managers and Staff of  
Health Care Services**

**EngenderHealth**

**DRAFT**

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## ACKNOWLEDGMENTS

The development of this simple cost analysis tool resulted from EngenderHealth's close collaboration and partnership with reproductive health programs in many countries. EngenderHealth\* first developed the Cost Analysis Methodology for Clinic-Based Family Planning Methods in 1996. This current, simplified version came out of EngenderHealth's work with Ministries of Health, Regional Supervisors, and their staff in Kenya, Tanzania, and Uganda, and is adaptable for all health care services. EngenderHealth staff and consultants who supported the development of this simplified version, reviewed it, and provided useful feedback include: Joseph Dwyer, Stephen Wanyee, Maj-Britt Dohlie, Erin Mielke, Karen Beattie, Manisha Mehta, David Adriance, Grace Wambwa, Isaac Achwal, Andrew Lopresti, Paul Libiszowski, and Charles Onoka (Family Planning Association of Kenya). This is the third draft of the tool, and EngenderHealth welcomes feedback for the next draft.

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\*EngenderHealth was known as AVSC International until March 2001.



## Why knowing the cost of services is important

Health care organizations often do not know what their costs are and have no simple way of assessing costs on a regular basis. However, many trends have made it more important than ever for non- and for-profit service-delivery organizations, as well as government agencies, to assess the cost of the services and clinical procedures they provide. Quite a few service-delivery organizations have experienced a decrease in funding from their own governments and donors and, therefore, face increasing pressure to become more accountable and efficient with the funds they do have available. At the same time, some face the need to begin charging user fees or to increase their fees in order to make their services sustainable--an increasingly important issue for different levels of managers in an era of decentralization and health-sector reform. Measuring, understanding, and documenting the cost of services can make it easier to improve the cost-efficiency of services, demonstrate funding needs to governments and donors, and set fees for clients based on realistic site costs.

This cost analysis tool (CAT) is a simplified tool that involves site administrators and service providers themselves in measuring recurrent direct costs of providing services. The tool has been kept as simple as possible because many sites do not have computers and staff trained to use more complicated financial accounting tools for examining costs.

The tool is focused on direct costs only for several reasons:

1. Some indirect costs may be lowered simply by promoting the rational use of site resources, such as staffing, administrative supplies, communications equipment, emergency transport, etc., all without the additional investment in time and effort to calculate indirect costs per service.
2. Direct costs are directly related to the provision of specific services; they are less complicated to calculate than indirect costs.
3. Information about the site's indirect costs may not be kept at the site level, for example, in a government system.
4. In sites using the cost information for setting user fees, many clients may not be willing or able to pay fees that cover direct costs, let alone pay for any additional indirect costs per service.
5. In health care settings, the costs of providing different services can vary widely, for example, between a vaccination (outpatient care) and major surgery (inpatient care). It is difficult to assess an indirect cost per service that is fair to all clients and at the same time encourages access to both preventive and curative care.

Many sites have found that they can collect sufficient initial data on costs with the use of CAT. Managers frequently feel unprepared to assess the costs of the services they provide and welcome an easy-to-use tool that staff can use at the site level.

*This tool can complement and feed into more comprehensive and complex cost analysis tools available depending on the site or organization's needs.* For example, some sites have used CAT (at the site level) and fed the information to the headquarters level, which has the capacity to use a more comprehensive tool.

Some of the sites EngenderHealth works with have used this tool together with *CORE: A Tool for Cost and Revenue Analysis*.<sup>1</sup> Other comprehensive tools that have been developed include the World Health Organization's (WHO) *Mother-Baby Package Costing Spreadsheet*.<sup>2</sup> Both *CORE* and the WHO package also use Excel spreadsheet software.

The *CORE* tool is for managers of health facilities or organizations to use in order to analyze and compare a facility's costs and revenues service by service, and to compare costs and revenues among facilities within the same organization. A cost analysis involving a central level and three facilities in an organization can take about four weeks using *CORE*.

The *Mother-Baby Package Costing Spreadsheet* is targeted at maternal and newborn health and safe motherhood planners, managers and policy makers at the national and district levels. A district-specific study using the *Mother-Baby Package* can take about three months.

It is important that whatever tool is used to analyze costs of service, the information be recorded and shared among different levels of an organization to minimize the duplication of effort and to enhance program planning, monitoring, and evaluation.

## **Audience for CAT**

Nonprofit, for-profit, and government agencies can use this simple tool to analyze costs of services. *Many organizations have found the tool technologically appropriate because it can be used either with or without a computer and takes only two to three days at a site to introduce, and to collect and analyze data.*

This handbook was developed as a training and reference tool to help introduce the cost analysis process to managers and staff in a health care facility. If the site has a quality improvement committee or team, that group can help facilitate the process and later carry on the process of calculating costs for other services or clinical procedures and continue to assess costs on a regular basis.

### **How often to use CAT**

Sites may want to assess costs one or two times a year, for example, when there are changes in:

- Cost of supplies (due to inflation, availability of supplies, etc.)
- Staff salaries (due to salary increases, changes in staffing, etc.)
- Services offered (services reorganized, new services introduced)
- Client load

## Advantages to using CAT

Who benefits	Potential benefits at each level
<ul style="list-style-type: none"> <li>Headquarters, Ministries of Health, donor organizations</li> </ul>	<ul style="list-style-type: none"> <li>Accountability and efficient use of funds and, ultimately, sustainability of programs</li> </ul>
<ul style="list-style-type: none"> <li>Site administrators</li> </ul>	<ul style="list-style-type: none"> <li>More efficient staffing and use of staff time and supplies at the site</li> </ul>
<ul style="list-style-type: none"> <li>Service providers and staff</li> </ul>	<ul style="list-style-type: none"> <li>Recognition and involvement in improving efficiency in implementing service protocols</li> </ul>
<ul style="list-style-type: none"> <li>Clients</li> </ul>	<ul style="list-style-type: none"> <li>Client fees reflect actual direct costs rather than fees set haphazardly</li> </ul>

## Who to involve

CAT requires the cooperation of different kinds and levels of staff. Before and during data collection, it is, therefore, important to inform and involve all staff who have direct contact with clients receiving the service or clinical procedure being analyzed. Staff with knowledge of the costs of supplies and those with knowledge of staff salaries, benefits, and facility overhead costs also need to be involved (see Step 2 below for the treatment of sensitive and confidential information). **The involvement of service providers with a good working knowledge of standards and medical practices is also important to ensure that the tool is used in a way that improves the quality of services.**

### What CAT measures

#### Direct costs

- Cost of staff time directly providing a service or clinical procedure
- Commodities, expendable supplies, and medications for a particular service or clinical procedure

CAT is a tool to analyze *direct* costs of providing services and clinical procedures. **Direct costs** are those directly related to a particular service or clinical procedure being analyzed:

1. *Cost of the staff time spent directly providing the service or clinical procedure, including the time spent preparing to provide procedures and the time spent cleaning up after procedures.* The actual cost of *staff time* for a particular procedure can be *variable* because sites can change the way staff time is spent in terms of who is

allowed to perform a particular procedure, what the procedure should be, or how the procedure should be carried out. However, the cost of *staff salaries* is *fixed* because the program incurs these costs regardless of the number of procedures provided. (The cost is the same whether the site provides 50 or 10 procedures.)

2. *Cost of commodities, expendable supplies, and medications.* These costs are *variable*. The site's expenses will be higher when it provides, for example, 50 as opposed to 10 procedures.

## Uses of the data

The data obtained by implementing CAT can be used to:

- Set user fees for different types of services and clinical procedures.
- Negotiate subsidies from donors or the government.
- Evaluate the financial implications of having different types of staff perform a clinical procedure or provide a contraceptive method. For example, the methodology can show what it costs to have: a doctor versus a nurse insert an IUD, an obstetrician versus a general practitioner or midwife deliver a baby, or a medical doctor versus a clinical assistant treat a sexually transmitted infection (STI). **These decisions cannot be based on cost alone but must be based on sound medical practice, the situation of the individual client, and so on.**
- Determine the cost of providing a service in different ways, for example, treat postabortion complications with manual vacuum aspiration (MVA) instead of dilation and curettage (D&C). **This and similar decisions cannot be based on cost alone but must be based on sound medical practice, the situation of the individual client, and so on.**

### What CAT does not measure

- Start-up costs (such as exam tables, equipment to provide a service and pre-service training)
- Depreciation (decrease in value of equipment, etc., over time)
- Opportunity cost to clients (what it costs clients to seek and use the service, such as transport, lost wages, etc.)
- Quality of services provided
- Demand for the service
- Clients' willingness and ability to pay for services
- Fees that other providers in the area charge for services

In summary, CAT helps (1) calculate the cost of services and clinical procedures, and (2) examine if resources are used efficiently. Other factors, such as the quality of services, must be addressed through the use of other tools and approaches.

What can happen when the quality of services is overlooked and decisions are based solely on costs? The following is an example of the danger of focusing on costs alone and making service quality suffer.

### **Example One: The potential danger of cost-cutting measures**

In order to save money, one country drastically reduced the numbers of support staff in hospitals who had been responsible for cleaning. The remaining nursing staff then had to clean both inside and outside the wards in the hospital compound, while continuing to perform their regular nursing duties in the wards. Because there was no increase in the numbers of nurses available to perform all the added tasks, clients suffered from inattention and long waiting times to receive nursing care.

Simultaneously, the cleaning tasks were not performed fully because the nurses' time was so limited. This cost-cutting measure made quality suffer and led the site to spend more money for cleaning by having nurses perform these duties, rather than having cleaning staff at lower salaries perform them.

## **Use CAT with other quality improvement approaches and tools**

Because CAT does not automatically interpret the quality of the services provided, it is important to use it together with other quality improvement approaches and tools, and in a manner that is conducive to quality improvement.

Quality can be defined as meeting the needs and expectations of clients with a minimum of effort, rework, and waste.<sup>3</sup> Organizations that prioritize quality always consider meeting clients' needs and expectations to be their overriding goal. To do so, it is helpful to think of the way you or your own family would like to receive services if you needed care. Continuous self-assessment and problem solving using COPE (Client-Oriented, Provider-Efficient Services) at the site, combined with facilitative supervision and staff development using a whole-site training approach help ensure that CAT is applied in a way that enhances the quality of services.<sup>4</sup>

In turn, analyzing costs supports other quality improvement efforts because many of these efforts focus on ways to examine processes related to service delivery in order to make these processes more efficient. More efficient processes make it easier to meet clients' needs and expectations, and generally lead to cost savings.

## Points to keep in mind while introducing CAT

**Create an environment of trust.** Analyzing the process of service delivery can be threatening to staff. Trust is a precondition for obtaining an honest analysis. CAT requires the examination of work processes and must not be used to blame or victimize individual staff members in any way.

**Adapt the introduction of the tool to the site.** As with all of EngenderHealth's quality improvement approaches and tools, the introduction of CAT must be adapted to the context of the site. Check to see, for example, that all appropriate steps and cadres of staff are listed on the form for the particular procedures to be analyzed.

**Ensure that the service or clinical procedure reflects appropriate, safe medical practices.** It is important that all clinical procedures and all tasks that make up each particular procedure reflect appropriate, safe medical practices. The process must allow time for staff to inform and counsel the client properly to ensure informed choice and consent; and to follow the necessary steps for infection prevention, etc. For this reason, medical and support personnel and administrators must work closely together when the site uses CAT. The strength of this simplified tool is that it encourages involvement and ownership through staff participation in the same way as COPE does.

**Cut costs by eliminating unnecessary effort and preventing rework and waste.** Use of CAT often reveals that staff time, as well as supplies and even equipment and space, can be better used. For example, some sites have discovered that staff use too much gauze or sutures for a given surgical procedure. Correcting inefficiencies in these areas leads to savings. *If cost cutting goes beyond this, it can be counterproductive to quality improvement*, for example, when the client-provider interaction is cut too short, or when an insufficient amount of chlorine is used for decontamination.

And because quality services must be client-focused, keep in mind the following.

### **Note: Consider the client when setting fees**

- CAT does not take into account the client's ability to pay for a particular service
- If fees are too high, some clients may avoid seeking services entirely
- There must be some mechanism for negotiating and explaining fees with communities, governments and donors
- Clients may be more willing to pay for curative services than for preventive services, so some services may charge higher fees for some services to “cross-subsidize” others

The next three examples are of sites that have successfully used CAT.

### **Example Two: IUD insertions and normal deliveries**

At a private hospital with an ob/gyn, medical officers, nurses, and midwives, the practice had been for the ob/gyn to insert IUDs for clients who wanted this method, although the nurses and midwives had been trained in the insertion procedure. After performing a cost analysis, the site provided the midwives with refresher training and reorganized the service protocols. Now the midwives insert IUDs and call the ob/gyn only when his expertise is needed. Appropriate training of the midwives made this possible, with no decline in medical safety.

Similarly, the midwives were well trained and capable of attending to normal deliveries. The ob/gyn remains available on-call for the clinic and is paid per case rather than per month. When he is not needed there, he spends more time offering specialized services. Because the ob/gyn was involved in the process, he saw the benefits of lowering costs for clients.

### **Example Three: Norplant insertions**

One Ministry of Health performed a cost analysis to assess the differences in cost and medical quality of having doctors versus nurses insert Norplant. A study\* showed that with training, nurses were equally capable of inserting Norplant, and that the Ministry of Health sites could use doctors' time more cost-effectively by making them available for more complicated surgeries and cases. This also made Norplant more readily available to clients.

\*(personal communication)

### **Example Four: Postabortion care**

One site performed a cost analysis as part of its introduction of improved postabortion care. After an orientation to postabortion care services, the receptionist in the outpatient department was able to recognize clients complaining of a miscarriage or suffering from an incomplete abortion. Now, the receptionist escorts them to the gynecology ward where the clients are attended by the medical staff on duty. In this way, these clients do not have to wait in a long queue to register and see a clinical officer in the outpatient department before going straight to the gynecology ward for immediate examination and appropriate treatment. Now, most patients are treated and discharged the same day, rather than staying overnight and incurring additional costs both to themselves and to the facility.

## How to use CAT

Review and adapt the following schedule as needed.

### Sample schedule

Preparatory Stage	Communicate with and orient site managers to the tool, review the tool, prepare materials
Day 1--Morning (One Hour)	Pay a courtesy call, review the purpose of the visit with site managers
Day 1--Morning (Two to Three Hours)	Conduct didactic training with site staff, including hands-on use of worksheets in classroom
Day 1--Afternoon (Two to Four Hours) Day 2--Morning (Two to Three Hours)	Assist staff to assess costs (including client-flow analysis) in wards and departments
Day 2--Afternoon (Two to Three Hours)	Wrap up, develop an action plan with site staff and managers

### Preparatory Stage: Prepare yourself and the site for the CAT introduction

Clear communication with site managers will help ensure that the activity goes smoothly.

1. Communicate with site managers about the purpose of CAT, the staff who should be involved in the exercise (all staff who have direct contact with clients receiving the services or clinical procedures being analyzed, staff who know the costs of supplies, and staff who know staff salaries), and set the date for introducing the tool.
2. Together, decide which version of the tool to use: the **computer** or the **manual** version. Find out if the site has a computer, as well as personnel familiar with spreadsheet software.
3. Ensure that you have the necessary materials for the version you choose.
4. If you use the computer version: copy the file to another diskette or a hard drive and use the copies for your analysis.

## Necessary materials

<p><b>For the computer version, you need:</b></p> <ul style="list-style-type: none"> <li>• Microsoft Excel (Windows 1995)</li> <li>• A diskette containing the worksheets (this comes with the handbook)</li> <li>• A watch that allows for measuring minutes accurately</li> <li>• The CAT handbook</li> <li>• A letter with information on CAT to send to the site administrator well in advance, as needed (see attached)</li> </ul>	<p><b>For the manual version, you need:</b></p> <ul style="list-style-type: none"> <li>• A calculator, pencils, and erasers</li> <li>• Blank copies of Worksheet One, Parts One and Two; Worksheet Two; and Worksheet Three, Parts One and Two--complete sets for each service or clinical procedure that you plan to analyze</li> <li>• A watch that allows for measuring minutes accurately</li> <li>• The CAT handbook</li> <li>• A letter with information on CAT to send to the site administrator well in advance, as needed (see attached)</li> </ul>
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4. Assist the site manager and staff in deciding how to collect the data required. This can be done various ways.
  - a. Conduct a client-flow analysis (in which all staff record the minutes of direct contact they spend with sample clients) as outlined in the COPE handbook to examine direct staff contact time with clients. Also, to determine cleaning and clinic preparation time, etc., staff will need to time themselves performing these tasks (or the facilitator will need to arrange for the quality improvement committee or a few staff members to observe and measure the staff time spent on these activities).
  - b. Staff receive thorough instructions and then measure their time spent as they provide the clinical procedure or method, clean up, etc., as outlined in Worksheet One, and the amount of supplies they used as outlined in Worksheet Three. The facilitator oversees the process and provides continuous feedback to the staff who are measuring themselves, ensuring that the information is properly timed and recorded.
  - c. Members from the quality improvement committee (or selected staff) can each follow a few clients from the moment they arrive at the reception desk until their discharge, measuring their contact time with staff; staff time for clean up, as outlined in Worksheet One; as well as measuring the amount of supplies used, measuring the supplies described in Worksheet Three. If the committee members choose to use this approach, it will be necessary to ask the clients' permission and explain the reason for following the clients.
  - d. The site needs to record which of these approaches it uses so that if and when it uses CAT again, it uses the same approach.

Keep in mind that the more staff are involved, the more ownership and commitment they will feel toward this effort.

**Day 1--Morning (One Hour): Meet with Site Managers**

1. Pay a courtesy call to site managers and review the purpose of the exercise, staff involved, types of records needed, and the schedule of activities.

<b>Examples of site records needed</b>
<ul style="list-style-type: none"> <li>• Personnel records with staff salaries and benefits</li> <li>• Drugs and commodities cost lists</li> <li>• Records of client load for specific services being assessed</li> <li>• Any records of site fees for specific services</li> </ul>

**Day 1--Morning (Two to Three Hours): Didactic Training Session for Staff**

**Step 1: Explain CAT and work through a practical example with site staff who will be involved in the data collection and analysis**

When staff know what is going on and understand the purpose, they are more likely to actively participate in using the tool.

1. Explain why it is important to know the cost of services and clinical procedures, and what CAT does and does not measure (refer to pages 1-7 of this tool).
2. Ask staff to select a service or procedure offered at the site, which you will use to practice completing the worksheets.
3. Ask the staff what they currently charge clients for this service or clinical procedure (and if there is any other income for each service or clinical procedure offered, e.g., a donor subsidy per client served in a particular service or clinical procedure). Note the information for later comparison.
4. For practice, review Worksheet One, Part One, filling in the information based on staff's educated guesses about the procedure that they have selected.

<b>Worksheet One</b>			
Calculation of Staff Time for Services or Clinical Procedures			
<b>Part One: Steps in Service Provision</b>			
Service or Clinical Procedure: _____			
Staff Time--Admission, Counseling, and Examination			
Location	Activity	Individual Responsible	Time (minutes)

This worksheet guides the site in identifying:

- Steps (tasks or activities) required to provide the service/procedure
- Type of staff who perform the steps
- Time needed to perform the steps
- Number of follow-up visits required (the worksheet allows up to two follow-up visits)

**Note the following:**

- Worksheet One is completed for each client and can be used for any type of service or clinical procedure.
  - Some activities or tasks are done per clinic session but affect all clients served during the session, e.g., cleaning the room at the end of the day. For such activities, at the end of the session, measure the total time spent and divide this figure by the number of clients served to find the average time (total time/number of clients = average time). Then enter the average time under the category of staff responsible for the task on Worksheet One.
  - For an activity, such as sterilizing equipment, follow the steps as described above, but count only staff time required for cleaning the equipment, **not** the time it takes the autoclave to process the equipment.
  - If you do not do a client-flow analysis (discussed in Step 3), you need to observe several clients, at least five or six, from the starting point (registration) through discharge, in order to calculate the average time for a particular service or clinical procedure. This also applies to follow-up visits.
5. Review Worksheet One, Part Two, and add the total staff time for a clinical procedure.

<b>Worksheet One</b>	
Part Two: Total Amount of Staff Time for a Service or Clinical Procedure	
Staff	Total Time

- The **computer version** automatically adds up the total amount of staff time utilized for different categories of staff. **Note:** if you have included other categories of staff not already listed on the worksheet, their time will not be automatically added. Their total time will have to be calculated manually.
- The **manual version** requires that the participants add up staff time for each category of staff from Part One of the worksheet. Then enter the amount in Part Two, e.g., all physician time is entered on the first line, all nurse time on the second line, and so on.

6. Review Worksheet Two and calculate the cost per minute of staff time.

Worksheet Two						
Calculation of Cost Per Minute of Clinic Staff Time						
A	B	C	D	E	F	G
Staff Position	Annual Salary and Fringe Benefits	Number of Working Days Per Year	Cost Per Day (B/C)	Number of Working Hours Per Day	Number of Working Minutes Per Day (E x 60)	Cost Per Minute (D/F)

This worksheet estimates the cost per minute of each staff member involved in providing direct client services. **Note that information related to salary and benefits is generally very sensitive and must be kept confidential.** When reviewing the worksheet, explain to the committee that you will use fictitious numbers, and that site staff with access to such information can later collect and enter the correct numbers. When they enter the correct numbers, they must follow these steps:

- Add any additional staff positions in Column A, as needed.
- Collect and enter annual salary and fringe benefits in Column B (taking an average salary if there are several staff in the same position with different salaries).
- Enter the number of working days per year in Column C.

<p><b>If you use the computer version:</b></p> <ul style="list-style-type: none"> <li>• The <i>cost per day</i> in Column D will be calculated for you.</li> <li>• Enter the number of hours each type of staff works per day in Column E. (For doctors, the number you use may be per session depending on the system used at the site.)</li> <li>• The <i>number of working minutes per day</i> in Column F will be calculated for you.</li> <li>• The <i>cost per minute</i> in Column G will be calculated for you.</li> </ul>	<p><b>If you use the manual version:</b></p> <ul style="list-style-type: none"> <li>• Divide the annual salary by the number of working days to find the cost per day for each type of staff: Column B/Column C = the cost per day, and enter the <i>cost per day</i> in Column D.</li> <li>• Enter the number of hours each type of staff works per day in Column E. (For doctors, the number you use may be per session depending on the system used at the site.)</li> <li>• Multiply the number of working hours per day by 60: Column E x 60 = the number of minutes worked per day, and enter the <i>number of working minutes per day</i> in Column F.</li> <li>• Divide the cost per day by the number of working minutes per day: Column D divided by column F = the cost per minute. Enter the <i>cost per minute</i> in Column G.</li> </ul>
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7. Review Worksheet Three, Part One, and calculate the total direct cost of staff time per procedure.

<b>Worksheet Three</b>			
Calculation of Service or Clinical Procedure-Specific Costs			
Name of Service or Clinical Procedure: _____			
Part One: Direct Cost of Staff Time			
Staff Position	A	B	C
	Time Spent	Cost Per Minute	Total Cost Per Client (A x B)

<p><b>If you use the computer version:</b></p> <ul style="list-style-type: none"> <li>The total direct cost of staff time per procedure will be calculated for you.</li> </ul>	<p><b>If you use the manual version:</b></p> <ul style="list-style-type: none"> <li>Enter the total amount of staff time for procedures for each category of staff from Worksheet One, Part Two, to Worksheet Three, Part One, Column A (time spent).</li> <li>Enter the cost per minute from Worksheet Two, Column G, to Worksheet Three, Part One, Column B (cost per minute).</li> <li>Multiply the time spent by the cost per minute and enter the <i>total cost per client for each category of staff</i> (Column A x Column B = Column C).</li> <li>Add all the numbers in Column C and enter the <i>total cost of staff time</i>.</li> </ul>
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8. Review Worksheet Three, Part Two. This shows service or clinical procedure-specific supplies.

<b>Worksheet Three</b>				
Part Two: Service or Clinical Procedure-Specific Supplies				
Item	A	B	C	D
	Amount in Unit	Unit Cost	Amount Used Per Client	Cost Per Client (C/A) x B

- Ask the group for estimates when explaining how to use Worksheet Three, Part Two.

- Explain that when staff go through this exercise, they need to carefully measure or count what they use.
- This exercise is a good opportunity to review whether correct supplies and measurements are generally used, which can help improve quality. If necessary, refer to the standards or manufacturers' instructions.
- Add any relevant supply items to the list (e.g., laboratory test reagents, etc.).
- It is **essential** that both medical staff and staff responsible for purchasing supplies assist in completing this section.

For **both** the **computer** and the **manual versions** of CAT:

- Enter the amount in the unit in Column A.
- Enter the unit cost of the item in Column B.
- Enter the amount used per client in Column C.

<p><b>If you use the computer version:</b></p> <ul style="list-style-type: none"> <li>• The <i>cost per client</i> will be calculated for you in Column D.</li> </ul>	<p><b>If you use the manual version:</b></p> <ul style="list-style-type: none"> <li>• Calculate the cost per client for each item: divide the amount used per client with the amount in the unit, and then multiply by the unit cost to get the cost per client for each item: <math>\text{Column C} / \text{Column A} \times \text{Column B} = \text{the cost per client}</math>. Enter the amount in Column D.</li> <li>• Add all the numbers in Column D. Enter the <i>total cost of supplies</i>.</li> </ul>
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9. Review Worksheet Three, Part Three. This shows the total direct variable costs for a clinical procedure.

<b>Worksheet Three</b>	
Part Three: Total Direct Variable Costs	
Total Cost of Staff Time	
Total Cost of Supplies	
Total Cost of Laboratory Tests	
Total Daily Inpatient Costs	
Other	
Total Direct Variable Costs	

<p><b>If you use the computer version:</b></p> <ul style="list-style-type: none"> <li>• The computer will automatically enter the <i>total cost of staff time</i> and the <i>total cost of supplies</i>.</li> </ul>	<p><b>If you use the manual version:</b></p> <ul style="list-style-type: none"> <li>• Enter the <i>total cost of staff time</i> from Worksheet Three, Part One.</li> <li>• Enter the <i>total cost of supplies</i> from Worksheet Three, Part Two.</li> </ul>
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For **both** the **computer** and the **manual version** of CAT:

- Enter any additional costs of laboratory tests, if applicable.
- Enter daily inpatient costs (such as staff time, food provided, etc., if applicable). It is advisable to use CAT to calculate these rates also. Multiply the cost per day by the number of days of a patient's stay in the facility.
- Enter other costs if applicable.
- Add all the costs to find the total direct variable costs for a clinical procedure (the computer version will calculate this automatically).

### **Day 1--Afternoon, Day 2--Morning**

#### **Step 2: Help the site collect the needed data and calculate the cost of one or more services or clinical procedures**

- The site calculates the direct costs of one or more services or clinical procedures based on site level data.

### **Day 2--Afternoon**

#### **Step 3: Wrap up at the site and develop an action plan**

- Compare the direct cost of providing a clinical procedure with the fee the site currently charges, as well as with any other income directly linked to the procedure (such as a donor or government subsidy for each client who receives a particular service). Base the comparison on the fees or other income discussed during the didactic training at the beginning of the exercise (see page 10 of this version).
- Help site staff use the data. Consider the following:
- Staff use: Does staff time appear to be used in the best way possible?
- Use of supplies, equipment, and infrastructure: Can these be used more efficiently?
- Cost sharing and fees: Are clients likely to be able and willing to pay a fee, or a higher fee? Would they be more willing to pay for some services or clinical procedures than others?
- Negotiation of subsidies: Would donors, the government, or insurance plans be willing to pay the gap between well-documented costs and the fees charged?
- Ways to provide the service or clinical procedure: Can different types of staff be used for delivering the service or clinical procedure?
- Work with staff to help them decide on a course of action and incorporate planned actions in the site's action plan. If the site has conducted COPE, this new plan should be integrated into the ongoing COPE action plan.

Here is an example showing the format for an action plan:

Action-plan format

<b>Problem</b>	<b>Cause(s)</b>	<b>Solution</b>	<b>By Whom</b>	<b>By When</b>
Site administrators do not know the direct cost of service X	Staff have never measured the direct cost of service X	Use CAT with the ward staff to find out the direct cost of service X	Name 1	Date 1
Direct costs for service Y are quite high	Staff are using supplies inefficiently, such as unnecessary amounts of gauze, sutures, etc., when providing service Y	Show all providers of service Y the appropriate amounts of supplies to use in providing service Y ( <b>and reinforce proper medical practices</b> )	Name 2	Date 2

Track changes in costs, income, and client load over time. The following shows one format a site can use to record this information over time.

Name of Service	Current Direct Cost	How Direct Cost Was Measured (client-flow analysis, observation of clients, staff interview, etc.)	Total of Current Income for Service (including any user fees, subsidies, etc.)	Number of Clients Per Year for the Service	Date

Consider ways to share and compare the information with other similar sites or with other levels within the organization (if the site is not a stand-alone facility).

## Notes

1. Management Sciences for Health, 1998.
2. World Health Organization (WHO), 1999.
3. Berwick et. al., 1990.
4. See AVSC International's *COPE: Client-Oriented, Provider-Efficient Services* (1995) and *Working Paper #11—Whole-Site Training: A New Approach to the Organization of Training* (1998) and EngenderHealth's *Facilitative Supervision Handbook* (2001) for more information about these quality improvement approaches.

## References

AVSC International. *COPE: Client-Oriented, Provider-Efficient Services*. New York: AVSC International, 1995.

Berwick, Donald M., Godfrey, A. B., and Roessner, J. *Curing Health Care: New Strategies for Quality Improvement*. San Francisco: Jossey-Bass, 1990.

Bradley, J., Lynam, P. F., Dwyer, J. C., and Wambwa, G. E. *Working Paper #11--Whole-Site Training: A New Approach to the Organization of Training*, 1998. AVSC International: New York.

*CORE: A Tool for Cost and Revenue Analysis User's Guide*, Version 1.0. Boston: Management Sciences for Health, 1998.

EngenderHealth. *Facilitative Supervision Handbook*. New York: EngenderHealth, 2001.

Papke, T. *Cost-Analysis Methodology for Clinic-Based Family Planning Methods*. New York: AVSC International, 1996.

World Health Organization. *Mother-Baby Package Costing Spreadsheet*, Version 1.01, 1999. Geneva.



Date

Dr. Ali Hassan  
X Hospital

Dear Dr. Hassan:

I thank you for inviting us to your hospital to introduce our cost analysis tool (CAT) and would like to confirm that I will arrive at x hospital on April 19, xxxx, at 9 A.M.

The introduction will take place over two days. The first morning, I will explain the tool to you and your staff. The rest of the time we will spend calculating the cost of one or more of the clinical procedures or contraceptive methods you choose to analyze first. Later, you may want to continue to analyze all the clinical procedures or methods you provide.

Many trends have made it essential for government, nonprofit, and for-profit hospitals to know the cost of the services they provide. All are increasingly asked to provide relatively more services with fewer resources. Many organizations--nonprofit as well as for-profit--have experienced a decrease in funds from donors. Clients may be neither willing nor able to pay more for the services they need. Because of this, many hospitals have had to begin to charge fees or increase their fees for services.

Knowing the costs of services and being able to explain costs to donors and clients can make it easier both to raise funds from donors and to charge clients fees. For-profit organizations either need to calculate their costs in order to set fees that cover costs, or to find ways to lower costs in order to make a profit that will ensure the sustainability of the organization. Nonprofit, for-profit, and government hospitals all need to find ways to use resources more efficiently and contain costs.

I appreciate your interest in this important endeavor and am looking forward to working with you and your staff. If you have any questions, please do not hesitate to contact me before I come to your hospital. Thank you.

Sincerely,

Xxxx  
Title  
EngenderHealth



# Worksheet One

Site Name.....

Date.....

## Calculation of Staff Time for Services or Clinical Procedures

### Part One: Steps in Service Provision

<i>Service or Clinical Procedure</i> .....			
<b>Staff Time--Admission, Counseling, and Examination</b>			
Location	Activity	Individual Responsible	Time (minutes)
	Register client	Receptionist	
	Collect payment	Cashiers	
	Take medical history	Nurse	
		Physician	
	Prepare room and client	Support staff	
		Nurse	
	Conduct physical examination	Physician*	
		Nurse	
	Laboratory--Register client	Receptionist	
		Cashiers	
	Laboratory--Conduct test(s)	Lab technician	
	Provide preprocedure information and counseling	Support staff	
		Nurse	
	Prepare examination room after each client	Nurse	
		Support staff	
	Schedule procedure (this may be scheduled for the same day or for another day)	Receptionist	
		Nurse	
<b>Daily Tasks in Procedure Room</b>			
	Prepare procedure room at beginning of day ( _____ minutes for _____ clients)	Support staff	
		Nurse	
	Clean and prepare examination equipment ( _____ minutes for _____ clients)	Nurse	
		Support staff	
	Clean room at end of day ( _____ minutes for _____ clients)	Support staff	
		Nurse	
	Overall staff supervision	Supervisor	

\* Actual involvement by a physician in this activity varies according to national and local protocols.



# Worksheet One

## Calculation of Variable Labor Costs

<i>Service or Clinical Procedure .....</i>			
<b>Staff Time--Surgical or Medical Procedure</b>			
Location	Activity	Individual Responsible	Time (minutes)
	Register client	Receptionist	
	Prepare client and take vital signs	Physician	
		Nurse	
	Provide preoperative drugs	Anaesthetist	
		Physician	
		Nurse	
	Repeat examination, review laboratory tests, and obtain informed consent	Physician	
		Nurse	
Surgical teams generally carry out a number of procedures in one session. The times listed should be divided by the number of procedures to obtain the time per procedure per client.			
<b>Preprocedure</b>			
	Prepare equipment and materials ( _____ minutes for _____ clients)	Nurse	
		Support staff	
	Perform scrub (surgical team)	Physician	
		OR Nurse	
<b>During procedure</b>			
	Give anaesthesia (General and/or local)	Anaesthetist	
		Physician	
	Clinical procedure _____ minutes each procedure and _____ minutes between clients for cleaning and preparation (total _____ minutes)	Physician	
		OR Nurse	
		Runner nurse	
		Support staff	
	Clean up procedure room ( _____ minutes weekly for _____ clients)	Support staff	
		Nurse	
<b>Postprocedure care</b>			
	Rest in recovery room ( _____ minutes for _____ clients)	Nurse	
		Support staff	
	Provide postprocedure instructions	Physician	
		Nurse	
	Schedule follow-up visit	Receptionist	
	Discharge patient	Physician	
	Clean up recovery room and equipment ( _____ minutes daily for _____ clients)	Nurse	
		Support staff	
	Overall staff supervision	Supervisor	



**Worksheet One**  
**Calculation of Variable Labor Costs**

<i>Service or Clinical Procedure.....</i>			
<b>Staff Time--First Follow-up Visit</b>			
Location	Activity	Individual Responsible	Time (minutes)
	Register patient	Receptionist	
	Review records	Physician	
		Nurse	
	Remove stitches or check postprocedure condition	Physician	
		Nurse	
	Clean up review room and equipment ( ___ minutes daily for ___ clients)	Support staff	
		Nurse	
	Overall staff supervision	Supervisor	

<b>Staff Time--Second Follow-up Visit</b>			
Location	Activity	Individual Responsible	Time (minutes)
	Register patient	Receptionist	
	Review records	Physician	
		Nurse	
	Remove stitches or check postprocedure condition	Physician	
		Nurse	
	Clean up review room and equipment ( ___ minutes daily for ___ clients)	Support staff	
		Nurse	
	Overall staff supervision	Supervisor	



## Worksheet One

### Part Two: Total Amount of Staff Time for a Service or Clinical Procedure

Staff	Total Time
Physician	
Nurse	
Receptionist	
Support staff	
OR nurse	
Runner nurse	
Lab technician	
Supervisor	
Cashier	
Others (1)	
Others (2)	
Others (3)	

## Worksheet Two

### Calculation of Cost Per Minute of Clinic Staff Time

A	B	C	D	E	F	G
Staff Position	Annual Salary and Fringe Benefits	Number of Working Days Per Year	Cost Per Day  (B/C)	Number of Working Hours Per Day	Number of Working Minutes Per Day (E x 60)	Cost Per Minute  (D/F)
Physician-sessional						
Nurse						
Receptionist						
Support staff						
OR nurse						
Runner nurse						
Lab technician						
Supervisor						
Cashier						
Others (1)						
Others (2)						
Others (3)						

### Worksheet Three

#### Calculation of Service or Clinical Procedure-Specific Costs

Name of Service or Clinical Procedure: .....

#### Part One: Direct Cost of Staff Time

Staff Position	A	B	C
	Time Spent	Cost per Minute	Total Cost Per Client (A x B)
Physician-sessional			
Nurse			
Receptionist			
Support staff			
OR nurse			
Runner nurse			
Lab technician			
Supervisor			
Cashier			
Others (1)			
Others (2)			
<b>Total Cost of Staff Time</b>			

### Worksheet Three

#### Part Two: Service or Clinical Procedure-Specific Supplies

Item	A	B	C	D
	Amount in Unit	Unit Cost	Amount Used Per Client	Cost Per Client (C/A) x B
Chromic catgut				
Plain catgut				
Silk No.2 or No. 0				
Cotton wool				
Absorbent cotton gauze (plain)				
Strapping (tape)				
Disposable syringes 2 cc				
Disposable syringes 5 cc				
Disposable syringes 10 cc				
Disposable syringes 20 cc				
Disposable needles				
Nondisposable surgeon's gloves				
Disposable gloves				
1% Xylocain without epinephrine				
Atropine injection (0.5 mg dose)				
Tincture of iodine				
Glove powder				
Autoclaving tape				
Surgical spirit (methylated spirit)				
Antiseptic solution				
Urine dipstick				
Paracetamol (acetaminophen)				
Surgical blades				
Soap				
Bleach/chlorine solution				
Diazepam 5 mg				
Falope rings				
Disinfectant solution				
Microscopic slides				
Condoms				
Silk sutures 2.0				
IUD				
Sanitary pad				
DMPA or Net En				
Alcohol				
Norplant implants				
Trocar				
Hand towel				
IV fluid (5% dextrose)				
Adrenaline injection				
Hydrocortisone injection				
Sofra-Tule (Vaseline gauze)				
Oxygen gas				
Halothan gas				
Nitrous oxide gas				
IV Ketamine				
Thiopentine				
Total Cost of Supplies				

### Worksheet Three

#### Part Three: Total Direct Variable Costs

Total Cost of Staff Time	
Total Cost of Supplies	
Total Cost of Laboratory Tests (Add only costs that are not already included above)	
Total Daily Inpatient Costs (Staff time, food for patients, etc.) (Cost per day _____ x number of days _____)	
Other (describe):	
<b>TOTAL DIRECT VARIABLE COSTS</b>	