

ECONOMIC EVALUATION OF ANTINEOPLASIC CHEMOTHERAPY ADMINISTERED AT HOME OR IN HOSPITALS

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Abstract

Objectives: Comparative economic evaluations of chemotherapy administered in hospital day-care units or in the home are relatively scarce. Furthermore, most existing evaluations do not include methodologic studies. This study seeks to compare the costs of anticancer chemotherapy with hospital at-home care versus a hospital day-care unit in the Rhône-Alpes region of France.

Methods: This study is based on a randomized controlled crossover trial that included 42 patients, to whom chemotherapy courses were alternatively given in both settings. All cost categories were taken into account according to microcosting methods. A detailed assessment was performed on coordination and health care in both structures (marginal costs and average costs), from the viewpoint of society.

Results: The marginal cost for one chemotherapy administration was significantly higher with hospital at-home care than in the hospital day-care unit (\$232.5 vs. \$157, $p < .0001$). Conversely, the average cost was significantly lower with home care than at the hospital (\$252.6 vs. \$277.3, $p = .0002$).

Conclusions: The results show that the interest of developing home care in anticancer chemotherapy is questionable regarding costs. In the French healthcare system, where there is a surplus of hospital beds, marginal costs seem to be more relevant indicators in most cases than average costs.

Keywords: Economic evaluation, Chemotherapy, Home care service, Day-care

Over the past several years, medico-economic evaluation of hospital at-home care has been the subject of numerous publications (3;18). The increasing interest in this subject is linked

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to both the development of home palliative care, particularly in the United States with hospice services (7), and the insufficient number of hospital beds in the United Kingdom (3;15). For the most part, works carried out evaluate costs and quality of life related to home care. The goal of these studies is to test the hypothesis that claims that this type of health care increases the quality of life of patients and, at the same time, decreases the cost of the treatment for society (2).

In France, the country in which hospital at-home care originated (4), this type of health care remains very limited (4,000 beds, corresponding to less than 1% of overall hospital capacity), and is largely concentrated in big cities (over 2,200 beds in the Paris region). Hospital at-home care in France, known as *hospitalisation à domicile*,¹ is far more restrictive than its Anglo-Saxon equivalents (hospital at home or home care) in terms of the types of health services it covers (13), because Anglo-Saxon home care includes medical services that fall under *home nursing care* in France. At this point in time, French public authorities seem willing to modify regulatory measures in order to encourage the development of hospital at-home services (13). As such, it is important to carry out evaluations concerning this type of healthcare management in terms of cost, as well as in terms of quality of life and patient preferences.

In France, cancer treatment represented 57% of hospital at-home care in 1999. If we limit this to occasional care (as opposed to ongoing treatment and rehabilitation), chemotherapy was the primary motive for patient management, representing 40% of home care (12). Within this context, a study was carried out in Lyon (located in the Rhône-Alpes region of France) to compare two methods of administering chemotherapy: in a hospital day-care unit or at home. The hospital day-care unit selected was at the *Centre Léon Bérard* (CLB), a comprehensive cancer center in this region. The day-care unit treats patients from all of the hospital's wards; in 1998 chemotherapy represented 58% of admissions. Hospital at-home care was managed by an association called *Soins et Santé*. This association works in direct contact with hospitals for cancer treatment, and in particular with the CLB.

The principal objective of the study was to compare patient satisfaction according to whether chemotherapy was administered at home or in the hospital. These results shall be reported in other publications. The work presented here concerns one of the secondary objectives of the study: the comparison of costs. More precisely, our aim was to evaluate the cost differential between chemotherapy administered at home or in a hospital day-care unit, then conduct a methodologic reflection on economic evaluation applied to hospitalization alternatives.

METHODS

The study was a prospective randomized controlled crossover trial. Patient inclusion took place from October 1995 to June 1998. Each patient had previously been hospitalized at the CLB. Within the trial framework, patients were required to undergo four chemotherapy courses: two at home and two in the hospital day-care unit. The order of passage was selected at random. At the end of the trial, patients were asked whether they preferred to continue chemotherapy at home or in the hospital day-care unit, this choice having been defined as the principal efficacy criterion. The reasons for the patients' choices were then studied by means of a cancer-specific questionnaire filled out by the patient and family members (4). In addition, three quality of life and anxiety scales were administered after the second course of chemotherapy treatment and once again at the end of the trial (the Functional Living Index Cancer [FLIC], the Montgomery scale [MADRS], and the Hamilton anxiety scale). Items related to costs were also recorded.

Certain heavy chemotherapy protocols were excluded from the trial because they could not be administered at home. Patient inclusion criteria were as follows:

- Patient had not received chemotherapy during the two previous months;
- Patient lived in the geographical sector covered by the hospital at-home organization;
- Patient lived with a family member;
- Patient's personal physician consented; and
- Patient had permanent access to a vein or an implantable venous access system (Port-A-Cath®).

After verifying the inclusion criteria and obtaining informed consent, patients were distributed into two groups by means of lottery: in group A the first two chemotherapy courses took place at the hospital and the following two at home, and vice versa for group B.

The difference in resources utilized in the two healthcare methods was evaluated from a societal point of view, in accordance with methodologic recommendations for evaluating healthcare programs (5). When possible, resources were gathered in physical quantities. Monetary valuation was carried out using 1998 unit costs, corresponding to the last year in which patients were included in the study.

We chose to evaluate costs per chemotherapy administration for the following reasons: a) one chemotherapy administration is the most homogeneous unit of activity; in effect, chemotherapy courses may include a variable number of administrations; and b) using one chemotherapy administration as the base analysis unit was adapted to the hospital's information system.

Typology of Costs

Various types of costs were distinguished. Over the course of 1 year, for example, the cost for chemotherapy treatment in a given healthcare facility can be modeled as follows:

$$CT(x) = CF + CV(x),$$

whereby x is the number of chemotherapy administrations, CF = fixed costs, CV = variable costs, and CT = total costs.

Approximately speaking, fixed costs correspond to overhead costs and variable costs to healthcare and coordination personnel, medication, and transport of patients between home and hospital (in the case of treatment in the hospital day-care unit). In addition, variable costs include any additional costs for patients resulting from home treatment. The choice of considering the cost of healthcare and coordination personnel as a variable cost could be discussed. Nevertheless, this viewpoint was maintained because the time devoted by this category of personnel to any specific activity within either of the two structures is open to change.

More simply, we can consider the variable cost as a linear function of x . This approximation is all the more valid since the variation of x is weak.

We can now define:

- a marginal cost $Cm(x) = a$,
- an average cost $CM(x) = CF/x + a$.

Thus, the average cost corresponds to the marginal cost plus overhead costs (for one average chemotherapy administration). The legitimacy of taking overhead costs into consideration in a cost comparison of two methods of healthcare management depends upon the real life decision-making setting. We will talk about this later in the Discussion.

Costs of Personnel

In a hospital day-care unit, patients admitted for chemotherapy first consult their oncologist or the intern attached to the ward, who then authorizes treatment if the patient's health

allows it. The hospital pharmacy then prepares the medication. Installation, surveillance, and removal of the antineoplasics perfusion is carried out by on-duty nursing staff, under the supervision of a head nurse. If patients are at the hospital over lunchtime they are served a meal by the nurses, who are assisted by nurse's aides. It is important to remember that all hospital staff are salaried employees.

In the home setting, the patient's personal physician makes a house call prior to each perfusion in order to authorize the chemotherapy. Following this, a nurse prepares and administers the product. Contrary to the hospital setting, the nurse remains with the patient during the entire perfusion. Before the first chemotherapy administration, both the oncology coordinator and a home-care head nurse visit the patient at home.

Thus, home chemotherapy treatments are carried out by:

- *Salaried employees*: oncology coordinator, head nurses in the two structures (hospital day-care unit and home-care organization), who co-ordinate the transfer of patients to the home, the head nurse at the home-care organization, who supervises nursing care, and the majority of nurses who intervene at home; and
- *Personnel paid on a fee-for-service basis*: patient's personal physician and, for certain chemotherapy administrations, self-employed nurses who are coordinated by the hospital at-home organization. Such medical acts are remunerated on the basis of tariffs fixed by the French Social Security system.

Costs for personnel were valued according to physical quantities, duration, or number of acts, then weighted with the corresponding unit costs (remuneration rates and Social Security tariffs, respectively). For hospital at-home care, activities carried out by medical personnel and nurses were divided between health care and coordination. This taxonomy highlights the importance of healthcare coordination, notably carried out by the oncology coordinator and the head nurses of the two structures (neither of whom intervenes directly in the treatment itself).

Health Care. In regard to salaried employees (physicians and nurses in the hospital day-care unit and part of the home-care nursing staff), costs were evaluated according to the amount of time spent on chemotherapy, weighted by the hourly cost in the two structures, respectively.

The amount of activity spent on chemotherapy was timed; however, nursing care in the hospital day-care unit was adjusted in order to be homogeneous with hospital at-home nursing. In effect, hospital at-home nursing care includes all of the time spent at the patient's home plus transportation time. It is therefore not limited to technical acts but encompasses time spent waiting, informing, and talking with the patient, as well as with the patient's personal physician and oncologist. However, in the hospital day-care unit, only time spent on the actual technical act could be measured. In order to measure global nursing time (providing information, communicating with patients, and coordinating other categories of personnel), it was necessary to make the following adjustments:

1. The proportion of nursing time in the hospital day-care unit corresponding to chemotherapy-related activity was calculated according to works carried out within the framework of French diagnosis-related groups (DRGs), on which public hospital financing is based (6;14). These works provide a measure of value for nursing care in each DRG. Based on the number of patients per DRG treated in the day-care unit in 1998, we were able to estimate the value of nursing care for chemotherapy patients as well as for all of the patient groups in the unit. We were then able to deduce the portion corresponding to chemotherapy.
2. The duration spent on chemotherapy treatment was obtained by applying this proportion to global nursing time in the ward in 1998.

3. The average amount of nursing time per chemotherapy administration was calculated by dividing this duration by the number of chemotherapy administrations carried out in the ward in 1998.
4. A comparison between the average amount of time thus obtained and the recorded timings provided a coefficient that enabled us to adjust the measured observations.

Nevertheless, it is important to note that this method could lead to an overestimation without knowing the true proportion. As previously mentioned, certain heavy chemotherapy protocols that could not be carried out at home were excluded from the trial.

To guarantee the homogeneity of nursing time taken into consideration (at home or in the hospital), another adjustment needed to be made concerning the preparation of medication. In hospital at-home care, the nursing personnel prepares the antineoplastic medication, whereas in the hospital day-care unit this operation is performed by the hospital pharmacy for reasons of security and economy related to product loss. The result is that this task is carried out by one single nurse with home care, but divided between several categories of personnel in the hospital day-care unit (nurse, dispenser, and nurse's aide). Therefore, it was necessary to add the time spent by the dispenser and the nurse's aide to the hospital day-care unit nursing time. This value was obtained by questioning the concerned parties directly.

On the other hand, personnel paid on a fee-for-service basis only intervene in home care. The number of medical acts carried out was gathered, then multiplied by Social Security tariffs. The house call made by the patient's personal physician (who authorizes the administration of antineoplastics) was valued at the rate of a general practitioner house call. In regard to home care administered by self-employed nurses, two rates were applied, depending on whether the perfusion was accompanied by other types of care (dressing, bathing, etc.).

Hospital At-home Coordination. All personnel who ensure the coordination of home care are salaried employees of one of the two structures (hospital at-home organization or hospital day-care unit). The transfer of patients from the hospital to home (departure from the hospital and transmission of dossiers to the hospital at-home organization), is managed by the home-care coordination bureau located in the hospital, which works hand-in-hand with the head nurses of the hospital at-home organization. The corresponding cost for both structures was estimated according to the average time required to finalize a transfer. Coordination of home nursing staff was carried out by head nurses in the home-care organization. Medical follow-up was ensured by the oncology coordinator, who was the contact person for both the general practitioner and the patient. The amount of time spent by the oncologist and head nurses was estimated by determining the average amount of time spent by each of the two parties on a chemotherapy cycle, adjusted to one chemotherapy administration.

Other Personnel Costs. In hospital at-home care, two other cost categories were included as well:

- Household help required on the day of the perfusion that was directly related to home medical care. The real costs for these interventions were attributed to the corresponding chemotherapy administration.
- Interventions by hospital at-home social workers for the initial home treatment. The time required for this intervention was estimated by the social workers themselves, then divided by the average number of chemotherapy administrations in the cycle.

For the hospital day-care unit, the time spent by admissions staff for one chemotherapy administration was obtained by dividing the global amount of working time by the number

of admissions. Time spent by nurses' aides on the patients' meals was also taken into consideration.

Medication

The principal medications consumed were antineoplastics, antiemetics, and corticoids. Medication was valued according to observed costs. In the hospital day-care unit, the unit cost retained was the price of acquisition from a centralized distributor. For each patient, only the cost of products actually administered was considered, since centralized preparation procedures limit waste due to packaging. For hospital at-home care, the unit cost retained was the price practiced by chemists, which is fixed during negotiations between the pharmaceutical companies and the French administration. The quantity retained was the quantity bought.

Nonetheless, certain hospital at-home organization facilities are located in hospitals and, as such, benefit from hospital purchasing methods. In order to take this into account, we presumed that medication represented the same cost with home care and at the hospital day-care unit in the sensitivity analysis.

Other Supplies

Remember that contrary to other types of hospital at-home care (e.g., palliative care, neurodegenerative disease), chemotherapy does not require specific equipment (medical beds, oxygen apparatuses, etc.). The material required for injections (syringes, tubes, antiseptics, etc.) is identical at home and in the hospital. These costs were therefore not included. The cost of food, considered to be equivalent at home and in the hospital, was also discarded from the analysis. The cost for hospital laundering was calculated by means of the hospital analytical accounting system and attributed to each chemotherapy administration.

Cost for Transporting Patients to the Hospital

Transportation was valued as if all patients chose to be reimbursed for traveling expenses by taxi or medical vehicle, since all of them have this right. It is difficult to estimate transport costs if patients use their own vehicle (possibly driven by a family member).

Costs Incurred for Patients

Costs incurred for patients or their family can be multiple. Such costs were searched for by means of a specific questionnaire.

Patients questioned declared that costs incurred for them were the same in both health-care management methods. In addition, family members were questioned about their obligation to be present, extra housework, additional fatigue and/or anguish, lack of free time or vacation, and extra expenses. In each of these categories, family members answered for the most part that they did not notice any difference between the two methods. Of the few persons who said they noticed a difference, just as many felt an additional load in both the hospital day-care unit setting and in the home setting.

Since this study is a differential evaluation, this cost category was discarded.

Overhead Costs

The average cost was obtained by adding the marginal cost and the average overhead costs. The difficulty in breaking down overhead costs in the hospital sector is well known (1;5;16). At the CLB, overhead costs were broken down into a *pro rata* value for DRG acts corresponding to chemotherapy administrations.

An evaluation of overhead costs associated to chemotherapy administrations was also performed at the *Soins et Santé* healthcare association by means of its analytical accounting system.

RESULTS

The number of subjects in the trial was originally set at 160. Remember, this number had been chosen in relation to the principal study criterion—that is, the patient's preference as to whether chemotherapy should be continued at home or in the hospital at the end of the trial (see Methods). However, of the first 52 patients who accepted to participate in the trial, 95% expressed a preference for home treatment. This being the case, the trial was terminated prematurely.

Sixty-two patients were approached, 10 of whom refused to participate: six did not have enough confidence in hospital at-home care, and four did not want to impose this situation on their close ones. Of the 52 patients who agreed to participate, 42 were retained in the medico-economic study. Of the 10 dropouts, six died before the end of the four chemotherapy courses, and the four others reported a deterioration in health status that required a modification in the treatment. The final population included 35 women and 7 men, the majority of whom suffered from malignant breast tumors (34 persons). No other tumor localization concerned more than one individual. Most patients had had surgery (86%): 61%, radiotherapy; and 46%, previous chemotherapy. The average age of the patients was 60 years, with a standard deviation of 11 years, and the most frequently used protocols were AC, CMF, and navelbine.²

All monetary results are in 1998 U.S. dollars, using purchasing power parities.

Personnel Costs

As previously mentioned, personnel costs were calculated by multiplying the amount of time spent on chemotherapy by the hourly cost for salaried employees, and the number of medical acts performed by the corresponding tariffs for self-employed personnel. Table 1 indicates the valuation for hourly costs (social security contributions included), and tariffs for personnel involved in either health care or coordination. Please note that the consultation preceding chemotherapy treatment at the hospital is carried out in 60% of cases by an oncologist, and in the remaining 40% by an intern. The cost of this consultation was calculated according to this distribution.

Personnel costs are summarized in Table 2. If we include all personnel cost categories, the cost for personnel is significantly higher with home chemotherapy (\$95.8 vs. \$55.0).

Healthcare Personnel. The cost for healthcare personnel is significantly greater with hospital at-home care (\$69.1) than in the hospital day-care unit (\$51.7). The observed difference is less a result of nursing care (\$49.3 for home care as compared with \$43.7 in the day-care unit) than of additional expenditure related to home consultations with the

Table 1. Hourly Costs and Tariffs for Health Care and Coordination Personnel (in U.S. Dollars)

Category of personnel	Hourly cost or tariff per medical act
Salaried nursing personnel ^a	20.9
Self-employed nursing personnel ^b	35.0
	40.8 ^c
Interns	14.6
Head nurse ^a	27.0
Oncologist	51.1
Patient's physician ^b	19.8 (house visit)

^aHourly cost is identical at home or in the hospital.

^bTariff as opposed to hourly cost.

^cPerfusion accompanied by other care (dressing, bathing, etc.).

Table 2. Cost of Personnel for One Chemotherapy Administration According to Setting (in U.S. Dollars)

Category of personnel	Home care		Hospital day-care unit		Home care – hospital day-care unit
	m_1^a	$(\sigma_1)^b$	m_2^a	$(\sigma_2)^b$	$m_1 - m_2^c$
Healthcare personnel	69.1	(19.2)	51.7	(10.6)	17.4 (S) $p < .0001$
Coordination	20.2		—		20.2
Other	6.6		3.3		3.3
Total	95.8	(19.2)	55.0	(10.6)	40.8 (S) $p < .0001$

^a m = average cost per chemotherapy administration.

^b σ = standard deviation.

^cDistributions compared by means of the Wilcoxon test. (S) = significant difference with threshold $\alpha = 5\%$.

physician (\$19.8 as compared with \$7.9 for the hospital consultation). Moreover, as previously mentioned, nursing costs at the hospital day-care unit were probably overestimated, which only reinforces the validity of this conclusion.

Coordination. Home-care medical coordination costs were estimated at \$20.2, one-half of which corresponds to the oncologist's salary adjusted to one chemotherapy administration. This category represents 20% of personnel costs for hospital at-home care.

Medication

The cost of medication for one chemotherapy administration is presented in Table 3. We observed that this cost category is almost twice as high in home care as at the hospital. In both settings, antineoplastics represent 80% of medication costs.

In Table 4 we break down costs for the three most frequent types of chemotherapy courses. We observed that the cost for one home chemotherapy administration exceeds the cost for one administration at the hospital day-care unit by 25% to 121%, depending on the type of protocol. However, this range merely reflects the difference in medication purchasing methods in home care and at the hospital.

Table 3. Cost of Medication for One Chemotherapy Administration According to Setting (in U.S. Dollars)

Type of course	Home care		Hospital day-care unit		Home care – hospital day-care unit
	m_1^1	$(\sigma)^2$	m_2^1	$(\sigma)^2$	$m_1 - m_2^3$
All courses	136.7	81.9	74.0	52.8	62.7 (S) $p < .0001$

^a m = average cost per chemotherapy administration.

^b σ = standard deviation.

^cDistributions compared by means of the Wilcoxon test. (S) = significant difference with threshold $\alpha = 5\%$.

Table 4. Cost of Medication for One Chemotherapy Administration with Most Frequently Used Protocols According to Setting (in U.S. Dollars)

Protocol	Home care	Hospital day-care unit	Home care – hospital day-care unit
AC	169.1	76.5	92.6
CMF	76.2	22.1	54.1
Navelbine	140.5	111.9	28.6

Other Marginal Cost Components

At the hospital day-care unit, the cost for transporting patients was estimated at \$21.8 per chemotherapy administration and the cost for laundering at \$6.1.

Overhead Costs

Overhead costs correspond to one chemotherapy administration, either at the hospital day-care unit or at home. These costs were estimated at \$120.3 and \$20.1, respectively.

Total Costs

Global results are presented in Table 5. We observe that the marginal cost for one chemotherapy administration, which does not include overhead costs, is higher at home than at the hospital with a significant difference of \$75.5. This result is due to personnel and medication costs, which are far greater at home. Nonetheless, this conclusion switches around if we look at average costs, which include overhead costs, with a significant difference of \$24.7 in the other direction. In effect, the portion of overhead costs in the average cost is far greater at the hospital (43%) than at home (8%).

Sensitivity Analysis: The Cost of Medication

If the cost of medication is clearly higher in home care, this is a reflection, as we previously saw, of the different purchasing methods practiced by the two structures. It was therefore interesting to examine how the comparison would have been affected if hospital at-home facilities had access to a hospital pharmacy. To do this, we aligned the cost of medication in hospital at-home care with medication at the hospital.

In Table 6, costs corresponding to hospital at-home care are qualified as “theoretical.” The differences between marginal costs and average costs maintain the same respective order; however, marginal costs are now closer, and the average cost for chemotherapy administered at home is clearly less than in the hospital day-care unit.

DISCUSSION

Comparison with Other Works

A search was carried out on publications concerning cost comparisons of chemotherapy according to place of administration (at a hospital or in the home). Although no

Table 5. Marginal Costs and Average Costs for One Chemotherapy Administration According to Setting (in U.S. Dollars)

Type of cost	Home care		Hospital day-care unit		Home care – hospital day-care unit
	m_1^a	$(\sigma)^b$	m_2^a	$(\sigma)^b$	$m_1 - m_2^c$
Personnel	95.8	(19.2)	55.0	(78)	40.8 (S) $p < .0001$
Medication	136.7	(81.9)	74.0	(58.2)	62.7 (S) $p < .0001$
Other ^d	—	—	28.0	—	-28.0
Marginal cost	232.5	(81.8)	157.0	(62)	75.5 (S) $p < .0001$
Overheads	20.1	—	120.3	—	-100.2
Average cost	252.6	(81.8)	277.3	(62)	-24.7 (S) $p = .0002$

^a m = average cost per chemotherapy administration.

^b σ = standard deviation.

^cDistributions compared by means of the Wilcoxon test. (S) = significant difference with threshold $\alpha = 5\%$.

^dTransport and laundering.

Table 6. Marginal Costs and Average Costs for One Chemotherapy Administration According to Setting (with Identical Medication Costs) (in U.S. Dollars)

Type of cost	Home care theoretical costs		Hospital day-care unit observed costs		Home care – hospital day-care unit
	m_1^a	$(\sigma)^b$	m_2^a	$(\sigma)^b$	$m_1 - m_2^c$
Marginal cost	170.0	(58.2)	157.0	(62.0)	13.0 (S) $p < .0001$
Average cost	190.0	(58.2)	277.3	(62.0)	-87.3 (S) $p < .0001$

^am = average cost per chemotherapy administration.

^b σ = standard deviation.

^cDistributions compared by means of the Wilcoxon test. (S) = significant differences threshold $\alpha = 5\%$.

French publications were found on this subject, five were identified in other countries (2;8;10;11;17). It is important to mention that only the evaluation by Rischin et al. (17) was based on a randomized controlled trial. Furthermore, the five articles did not encompass certain criteria that would have been necessary to transpose these results to the French healthcare system (19). Unit prices and hourly costs are not communicated, and descriptions of facilities are not thorough enough. Of the five studies, three concern paediatrics (2;8;10), where transferring the patient to the home setting places a much greater load on the patient's family, as underlined by Stommel et al. (20). As for the two studies concerning adults (11;17), we observe that their results coincide with our own: a favorable differential for hospital day-care units in terms of marginal costs, yet favorable to home care from the standpoint of average costs.

Generally speaking, the comparability of results is limited by healthcare safety regulations, which vary from country to country, in particular concerning the amount of time nurses must remain present during home treatment. Moreover, as pointed out by Coast et al. (3), certain hospital at-home schemes are evaluated even though they are still in the experimental phase, which can lead to lower efficacy and higher costs.

Coordination

Coordination represents more than 20% of global home-care personnel costs. In addition to the important role played by the coordinating physician, as emphasized by the Ministry of Health (12;13), it is important to remember that the role played by home-care head nurses is also very important. It is their activity (managing and monitoring nursing care) that ensures the quality and safety of home healthcare services.

Costs of Medication Linked to the Organization of Home Care

The observed cost level for medication in home care leads us to question the rules and regulations governing access to medication. Supposing that these costs were the same for home care as in the hospital, the cost differential observed for marginal costs would tend to disappear. It is worth noting that some change in these rules is taking place: hospital at-home care organizations can now acquire certain drugs at hospital prices.

The Choice of Marginal Costs or Average Costs

It appears that results are greatly influenced by the methodology applied. In a situation such as this, it is indispensable to justify the approach chosen and define the limits of its validity. As underlined by Coast et al. (3) in the sole article concerning the methodology of evaluating hospital at-home care, the choice of using marginal costs or average costs must first and foremost be based upon the organization's capacity to admit additional patients. Indeed, if

an organization is operating at full capacity, the admission of new patients generally requires additional facilities, and the corresponding cost could be estimated based upon average cost. If, to the contrary, the organization's full capacity is not being used, new patients can be treated without any modification to the structure, as long as they are not too numerous. The resulting cost in this case could be estimated based upon the marginal cost.

In a more general fashion, the choice of relevant costs in a comparison of two types of patient management must be driven by the decisional setting studied. If, for example, the transfer of activity from a hospital day-care unit to the home is minor, and if the hospital at-home organization is operating at full capacity, the most relevant costs to be used in the comparison would be the marginal cost for the hospital and the average cost for home care. In light of the results obtained, whereby the marginal cost for hospital day-care (\$157.0) is less than the average cost of home care (\$252.6), the anticipated transfer would represent an increase in costs.

POLICY IMPLICATIONS

To the question: "Is the administration of antineoplastic chemotherapy less costly for society at home than in the hospital?", we are obliged to respond that there is no simple answer, for it depends entirely upon the setting studied.

The cost comparison here is unfavorable toward hospital at-home care if we presume that the transfer of activity from the hospital to the home is minimal. In this case, the relevant cost for the hospital is the marginal cost, which is lower than either the average cost or the marginal cost for home care. But it is important to emphasize that in the hospital at-home setting studied here, the home was never very far away from the hospital and, as such, the cost of transportation from home to the hospital remained low. The comparison of costs would obviously be more favorable for hospital at-home care in rural areas, where patients' homes might be located far away from the hospital (9). This observation could serve as an argument for the development of healthcare organizations in rural areas in coordination with local community care and hospitals.

In any case, the comparison of costs must be viewed in relationship to the results. When there is no clinical difference between the two types of patient management, patient satisfaction becomes a relevant criterion. Within the framework of our study, hospital at-home care was elected by the overwhelming majority of patients, with a preference rate of 95% at the end of the trial. This result does not indicate a rejection of the hospital setting, since patients declared being satisfied with their hospital, but rather a preference for healthcare management methods that enable them to maintain their daily habits and family context.

NOTES

¹ The term "*hospitalisation à domicile*" corresponds to a legal form of healthcare recognised within the French administration.

² AC-adriablastin (doxorubicin), endoxan (cyclophosphamide); CMF-endoxan, fluorouracile, methotrexate, navelbine (vinorelbine).

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