

Clinician Costs in Aphasia Treatment: How Much Is a Word Worth?

Allen E. Boysen and Robert T. Wertz

What we know about the costs of treating aphasia resembles a box of picture puzzle pieces. However, many of the pieces are missing, and there is no colorful representation of the end product. We are not certain what we have, what we are missing, or what the product should be. These are the data we use to plan services for managing aphasia. While we can link some of the pieces to form fragments of what it costs society and individuals to endure aphasia, we are missing the pieces that represent changes in the quality of life resulting from being aphasic and how much or whether treatment for aphasia improves quality of life; essentially, how much is a word worth?

The most common cause of aphasia is stroke. Of the estimated 400,000 strokes that occur in the United States each year, 80,000 are believed to result in aphasia (National Aphasia Association, 1989). Little is known about how many of these 80,000 aphasic people receive language treatment or, for those that do, how much treatment they receive. Even less is known about the cost of the treatment provided. Gross estimates indicate annual cost, direct and indirect, for stroke in the United States is \$17.9 billion (Lewin-IFC, 1992). Again, how much of this is spent on providing language treatment for stroke victims who are aphasic is unknown.

Medical economists divide costs into direct—space, personnel, and disposable items—and indirect—days of hospitalization, time until return to work, change in work status, change in personal income, level of physical leisure activity, and quality of life (Eisenberg, 1989). The least expensive treatment in direct costs is not necessarily the most cost-effective. Increased direct costs may be offset by decreased indirect costs. For example, a more expensive treatment may reduce the days of hospitalization, shorten time until return to work, and result in a better quality of life than a less expensive treatment. Thus, clinical management balances efficacy, effectiveness, and economics.

Clinical aphasiology has emphasized efficacy—whether treatment achieves a specified effect; flirted with effectiveness—whether treatment results in desired functional gains; and ignored economics—what treatment costs and whether the improvement obtained is worth the cost. The purpose of this paper is to present the estimated clinician cost in treatment trials that explored the efficacy of treatment and to suggest means for determining the cost-effectiveness of treatment.

METHOD

Even in controlled treatment trials, data are unavailable on all direct and indirect costs. For example, some study patients were inpatients, and some were outpatients. The former are more expensive than the latter. Precise overhead costs such as utilities, building and equipment depreciation, and maintenance are unavailable and probably varied among studies. Similar problems exist with indirect costs. Unknown are days of hospitalization, time until return to work, change in personal income, etc. Thus, total costs, on both direct and indirect, in any of the treatment trials cannot be recovered.

Cost for personnel to provide treatment can be estimated, and the amount of treatment administered in each investigation is generally known. Certainly, hourly cost for treatment varies among settings. Loverso (Personal communication, 1994) indicated that even in a single setting, hourly personnel cost for aphasia treatment will range from \$33, if provided by a full-time employee, to \$55, if provided by per diem personnel.

We have calculated the hourly cost, salary, and benefits of a speech-language pathologist in the Department of Veterans Affairs (VA) at \$28 and used that in the analyses that follow. We assume that the results achieved in each of the investigations analyzed would have been achieved if the treatment had been administered by a VA speech-language pathologist. Of course, this assumption is fragile, but for the purpose of preliminary cost analysis, we suggest it is acceptable to suspend disbelief.

The five investigations shown in Table 1 were selected for analysis. Criteria for selecting investigations were that the amount of treatment administered was available, and the efficacy of the outcome was known. All study patients were aphasic subsequent to a stroke or strokes. Four investigations (Basso, Capitani, and Vignolo, 1979; Shewan and Kertesz, 1984; Wertz et al., 1981; Wertz et al., 1986) reported the positive results that treatment was efficacious. One investigation (Lincoln, McGuirk, Mulley, Lendrem, Jones, and Mitchell, 1984) reported the negative result that treatment was not efficacious. Amount of treatment administered ranged from 48 hours per patient (Lincoln et al., 1984) to 264 hours per patient (Wertz et al., 1981). The

Lincoln et al. investigation is problematic. Even though 48 hours of treatment were prescribed, less than one-third of the treated patients received 48 hours of treatment. We estimated cost based on the treatment prescribed.

When a range of treatment was permitted within an investigation, for example, 6 to 8 hours a week, the lower number was selected to achieve consistency across investigations. Only treatment hours were analyzed. Time spent in evaluation, patient and family counseling, treatment planning, and record keeping were not known.

RESULTS

Because the number of treatment hours each week and the duration of the treatment trial varied among studies, clinician cost per patient to administer the treatment also varied. As shown in Table 2, total clinician cost for each patient, using \$28 per hour for a VA speech-language pathologist, ranged from \$1,344 in the Lincoln et al. (1984) investigation to \$7,392 in the first Veterans Administration Cooperative Study (Wertz et al., 1981).

Table 1. Intensity, Duration, and Efficacy in Selected Treatment Trials

<i>Trial</i>	<i>Treatment</i>		<i>Efficacy</i>
	<i>Hours Per Week</i>	<i>Duration In Weeks</i>	
Basso et al. (1979)	3	26	+
Lincoln et al. (1984)	2	24	-
Shewan and Kertesz (1984)	3	52	+
Wertz et al. (1981)	6	44	+
Wertz et al. (1986)	8	12	+

Note: + = treatment was efficacious; - = treatment was not efficacious

Table 2. Clinician Cost Per Patient in Selected Treatment Trials

<i>Intensity</i>	<i>Duration</i>	<i>Cost Per Patient</i>
3 Hours/Week	26 Weeks	\$2,184
2 Hours/Week	24 Weeks	\$1,344
3 Hours/Week	52 Weeks	\$4,368
6 Hours/Week	44 Weeks	\$7,392
8 Hours/Week	12 Weeks	\$2,688

Two of the treatment trials, Basso et al. (1979) and Shewan and Kertesz (1984), demonstrated treatment was efficacious by comparing improvement in treated patients with self-selected, nontreatment groups. Total clinician costs for each patient are \$2,184 in Basso et al. and \$4,368 in Shewan and Kertesz. The first Veterans Administration Cooperative Study (Wertz et al., 1981) implied treatment was efficacious based on significant improvement in treated patients between 6 and 12 months post onset—after spontaneous recovery in stroke is assumed to have ended. Clinician cost for each patient was \$7,392. The second Veterans Administrations Cooperative Study (Wertz et al., 1986) demonstrated treatment was efficacious by comparing improvement in treated patients with a randomly assigned nontreatment group. Clinician cost for each patient was \$2,688.

Obviously the cost for treating aphasia is expensive, and our analyses only capture a fraction of total direct and indirect costs. Clinician costs alone ranged from \$1,344 per patient for treatment that was not efficacious to \$7,392 for treatment that was efficacious. The best buy for an efficacious treatment was 3 hours a week for 26 weeks at a cost of \$2,184 (Basso et al., 1979).

We can speculate on the direct costs not captured in our analysis. For example, a typical means for capturing some direct costs such as utilities, building and equipment depreciation, maintenance, etc., is to figure **overhead**. This is computed by adding personnel costs and all other costs and determining the percentage each contributes to total cost. Because all other costs are unknown for any of the clinical trials, we computed hypothetical overheads of 25%, 50%, and 75% based on estimated clinician cost for each of the five treatment trials. Table 3 indicates that for the least expensive, efficacious treatment, 3 hours a week for 26 weeks (Basso et al., 1979), per patient cost ranged from \$2,730 at 25% overhead to \$3,822 at 75% overhead. For the most expensive, 6 hours a week for 44 weeks (Wertz et al., 1981), per patient cost ranged from \$9,240 at 25% overhead to \$12,936 at 75% overhead.

Table 3. Costs Per Patient with Different Amounts of Institutional Overhead

<i>Intensity</i>	<i>Duration</i>	<i>Overhead</i>		
		25%	50%	75%
3 Hours/Week	26 Weeks	\$2,730	\$3,276	\$3,822
2 Hours/Week	24 Weeks	\$1,680	\$2,016	\$2,352
3 Hours/Week	52 Weeks	\$5,460	\$6,552	\$7,644
6 Hours/Week	44 Weeks	\$9,240	\$11,088	\$12,936
8 Hours/Week	12 Weeks	\$3,360	\$4,032	\$4,704

In the VA, general information on overhead is available. For an outpatient visit, personnel services constitute 85% of total costs, and other costs account for 15% of total costs. It is not clear whether all other costs, for example, building and equipment depreciation, are contained in the 15% overhead figure. Nevertheless, as shown in Table 4, at the 15% VA overhead, cost per patient in the five treatment trials examined ranged from \$1,546 for inefficacious treatment through \$2,512 for the least expensive efficacious treatment to \$8,500 for the most expensive efficacious treatment. Of course if treatment is provided to inpatients, cost is considerably more. The cost varies depending on where within a medical center the patient resides. For example, in the VA, cost per patient per day ranges from \$85 in a domiciliary bed to \$612 in a medical bed.

DISCUSSION

The statement, "American health care costs too much," is not an original observation. The current annual bill is over \$800 billion; nearly 14% of the gross national product (Enthoven, 1992). If the treatment of aphasia is to stay afloat in today's economy, aphasiologists must become serious about economics as well as efficacy. To begin we need to collect accurate evidence on the current cost of aphasic treatment. For example, what are the direct and indirect costs for treating aphasia? Some of these data exist and can be obtained, for example, cost for space, personnel, and disposable items to treat aphasia. Methods for collecting other necessary data need to be developed, for example, cost for change in patients' income, change in the level of communicative leisure activity, and change in the quality of life.

We have said nothing about cost-benefit beyond the observation that treated patients improve significantly more than untreated patients. Essentially, how much is a word worth? This could be determined by comparing **treatment effect**—the specified difference to be achieved between treated and untreated patients—with the cost of treatment. Treatment

Table 4. Cost Per Patient at 15 Percent Department of Veterans Affairs Overhead

<i>Intensity</i>	<i>Duration</i>	<i>Cost Per Patient</i>
3 Hours/Week	26 Weeks	\$2,512
2 Hours/Week	24 Weeks	\$1,546
3 Hours/Week	52 Weeks	\$5,023
6 Hours/Week	44 Weeks	\$8,500
8 Hours/Week	12 Weeks	\$3,091

effect size was not specified by Basso et al. (1979) or Shewan and Kertesz (1984). Both VA cooperative studies established a 15% difference in the PICA overall percentile as the treatment effect size. Combining estimated personnel costs and the VA 15% overhead for outpatient treatment, this translates into \$567 per percentile for the first cooperative study and \$206 per percentile for the second.

Is what we call efficacious aphasia treatment worth what it costs? We don't know. One way to find out is to compare amount of improvement in aphasia with its influence on patients' livelihood, leisure activity, and quality of life. These data, and the means to collect them, are some of the pieces of the puzzle that are missing.

The cost of aphasia treatment we have presented is based on estimates and assumptions. We do not know exactly the cost of what we do or whether what we do is worth what it costs. Probably, it is time for aphasiologists to determine exactly what it costs to provide treatment and whether the treatment provided is worth the cost. We suspect, aphasia treatment will be driven in the future by economics as well as efficacy. If we do not provide the data to answer the questions, we may be forced to live with erroneous answers. Thus, the old question "Is treatment *being* effective?" must be revised to ask, as well, "Is treatment cost-effective?"

REFERENCES

- Basso, A., Capitani, E., & Vignolo, L. (1979). Influence of rehabilitation of language skills in aphasic patients: A controlled study. *Archives of Neurology*, *36*, 190-196.
- Eisenberg, J. M. (1989). Clinical economics: A guide to the economic analysis of clinical practices. *Journal of the American Medical Association*, *262*, 2879-2886.
- Enthoven, A. C. (1992). Health care: Prescription for change. *Stanford*, September, 28-33.
- Lewin-IFC (1992). *The cost of disorders of the brain*. Prepared for the National Foundation for Brain Research, Washington, DC.
- Lincoln, N. B., McGuirk, E., Mully, G. P., Lendrem, W., Jones, A. C., & Mitchell, J. R. A. (1984). Effectiveness of speech therapy for aphasic stroke patients: A randomized controlled trial. *Lancet*, *1*, 1197-1200.
- Loverso, F. L. (1994). Personal communication.
- National Aphasia Association (1989). Impact of aphasia on patients & family. *Aphasia*, *1*, 1-6.
- Shewan, C. M., & Kertesz, A. (1984). Effects of speech and language treatment on recovery from aphasia. *Brain and Language*, *23*, 272-299.
- Wertz, R. T., Collins, M. J., Weiss, D., Kurtzke, J. F., Friden, T., Brookshire, R. H., Pierce, J., Holtzapple, P., Hubbard, D. J., Porch, B. E., West, J. A., Davis, L., Matovitch, V., Morley, G. K., & Resurreccion, E. (1981). Veterans Administration

cooperative study on aphasia: A comparison of individual and group treatment. *Journal of Speech and Hearing Research*, 24, 580-594.

Wertz, R. T., Weiss, D. G., Aten, J. L., Brookshire, R. H., Garcia-Bunuel, L., Holland, A. L., Kurtzke, J. F., LaPointe, L. L., Milianti, F. J., Brannegan, R., Greenbaum, H., Marshall, R. C., Vogel, D., Carter, J., Barnes, N. S., & Goodman, R. (1986). Comparison of clinic, home, and deferred language treatment for aphasia: A Veterans Administration cooperative study. *Archives of Neurology*, 43, 653-658.