

# Time Lapses in Information Dissemination: Research Laboratory to Physician's Office

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## ABSTRACT

To illustrate the extent of time lags from manuscript submission to journal publication certain "core" journals in neurology and general medicine have been surveyed. The clinical journals experience less time lag, but more of a problem with backlogs of manuscripts, than basic research journals. Most editors of the journals surveyed cited the following as the major causes for publication delay: failure of authors to follow journal requirements, slowness of editorial and referee reviews, and author revisions.

After reviewing the results of the journal survey and articles concerning information dissemination, it seems that the role of the journal is changing. Publication speed in a journal is not of vital importance to members within an "invisible college" but is important to those conducting research in fields outside of their "invisible college" contacts. Distinctions will have to be made between the archival function and the rapid dissemination function if efficient and effective modes of information dissemination are to be developed.

THE time lag in information dissemination continues to be a problem acknowledged by scientists and physicians. Recent editorials and letters to the editor appearing in *Nature* (1-3), the *British Medical Journal* (4), and the *American Journal of Psychiatry* (5, 6), either lament the time lag of articles being published or reprove authors for being overly critical of time lags. Other factors besides time lapses in journal publication are responsible for delay in information dissemination. Recognition that a

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research finding has clinical significance may be slow in coming. This factor alone may slow further development of related research far more than publication lag. Although the time lag in journal publication is a problem, there has been little documentation concerning how much and why.

For this project certain "core" journals in neurology and general medicine were selected to illustrate the importance of time lapses between the submission of a manuscript for publication and its actual appearance in the journal. The results of a survey of these journals will be presented and an attempt made to correlate the findings with the trends in information dissemination. Finally, some of the trends in information dissemination will be discussed.

To determine time lapses, letters were sent to the editors of selected journals, asking about the time lags in their journals and what factors contributed most to delays. For convenience, the journal titles were arbitrarily divided into two groups: clinically-oriented and basic research-oriented.

It was assumed that the main factors contributing to the time lapses between the submission of a manuscript and its eventual appearance in a journal are: backlog of manuscripts; evaluations by editors and referees; author revisions; type-setting, layout, and printing; return of galley proofs by authors; and distribution to readers. (The figures shown on the charts are averages quoted by the editors.)

Editors of the basic research journals offered some rather interesting comments (Figure 1).

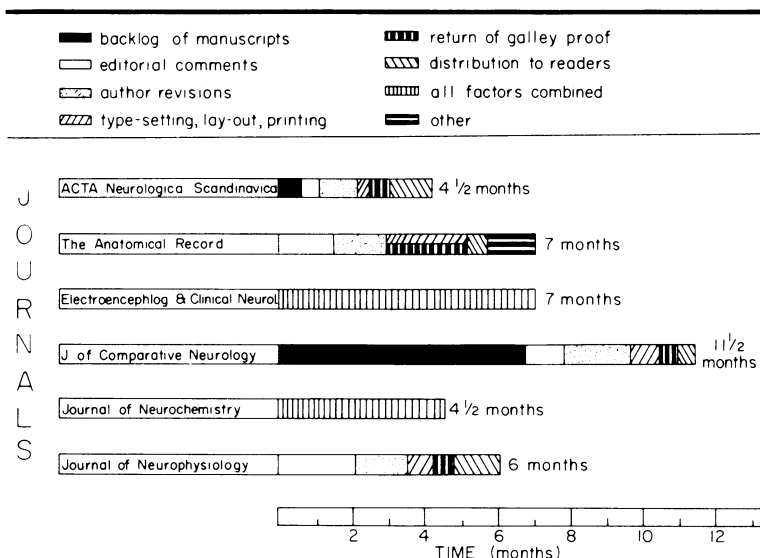


FIG. 1—Time lapses in basic research journals.

The editor of the *Anatomical Record* reported that the major factors in the delay of manuscript publication were failure by authors to conform to journal requirements stated in the instructions for contributors, and the printing process. (He suggested that the delay in the printing process may be minimized by trying photo-offset of manuscripts without sending galley proofs to the authors (7).) The editor of the *Journal of Comparative Neurology* attributed delays to the backlog of manuscripts. To remedy this situation he resorted to the publication of two issues per month (8). The editor of the *Journal of Neurochemistry* reported that major delays occurred in the printing process. This had been remedied by a speedier press which had cut the time lapse from six months to four and one-half months (9). The editor of the *Journal of Neurophysiology* said that his major delay was caused by waiting for author revisions. (The record wait that he experienced was eighteen months.) To give readers of the *Journal of Neurophysiology* an idea of the time lapse, the table of contents of each issue lists the date when the manuscripts were received in their final form ready for printing (10).

Interesting comments were made by the editors of *Electroencephalography and Clinical Neurophysiology*. It takes about twelve weeks for a manuscript to be reviewed by referees and

the editor and to have author revisions completed. Each month the editor receives a Stock List in which papers are coded according to the state of readiness (usually about fourteen weeks to reach the stage at which the first proofs are back from editor and author). If a paper has been coded 10 (final form) on the Stock List, it still takes approximately fourteen weeks before delivery of early copy. Add ten days to that figure for distribution in Europe and add three weeks for delivery in America. Since there are ordinarily 150 papers on hand to make a 112-page issue, many of the papers are delayed until the next month's issue, causing another delay. One of the editors stressed greater editorial concern with the quality of the journal than with the speed of publication. Quality requires extensive use of referees, literature searches to determine whether someone else has published the same ideas, and checks of formulae and statistics by experts. At the same time the editors feel an obligation to keep the cost of the journal within financial reach of the scientists. Because the *EEG Journal* is an international journal, two special factors contribute to delay: the poor English used in manuscripts from non-English speaking authors, and the need for expert translations of the summaries. The journal publishes a summary of each article in either French or English, depending upon the language of the original

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article. At the other end of the spectrum, *Experimental Neurology* has an editorial policy of accepting manuscripts only if they can be published within six months (11).

Editors of the clinical journals also stated that delays were largely due to the time spent on author revisions and reviews by referees (Figure 2). The editor of *Neurology* pointed out that occasionally there were delays in referee responses because the referees were away or on vacation. He also recommended that the galley proofs be returned to the publisher instead of the editor (12).

Another problem occurs when there are too many articles for one issue. The editor of *Brain*, a quarterly journal, stated that even when a manuscript was accepted, it did not necessarily appear in the next issue. Usually the article was published in a subsequent issue, which meant a delay of six to nine months instead of two and one-half months (13).

In comparing the time lapses of clinical and basic research journals, one notes a tendency for clinical journals to experience less time lapse and a greater backlog of manuscripts than is characteristic of basic research journals. A majority of the editors, of clinical and basic journals alike, cited failure of authors to follow the instructions for contributors, slowness of author revisions, and time spent in editorial or referee reviews as the main factors for the delay in journal publication. The rejection of a

manuscript by one or more journals before finally being accepted may add ten to twelve months to the publication process (14).

However, publication speed is not necessarily the major factor in the overall development of a concept; delayed recognition that a finding has clinical significance may be a greater factor. For example, the development of L-Dopa as a therapeutic agent for treating Parkinsonism has been documented (Table 1). The single most important paper which initiated research interest in L-Dopa was published in 1958 by Carlsson and his associates. However, the drug was not actually available for general use until June 1970. Thus, it took from 1958 until 1970 before the concept of using L-Dopa to treat Parkinsonism became accepted and established. Therefore, a time lag of approximately six months in journal publication is not much when compared with a time span of twelve years. Those scientists who were intimately associated with research on L-Dopa were aware of the latest developments or experimental results some time before the articles were published, because they had used informal channels of communication such as telephone calls, letters, etc. Another study by Neelameghan (15) on the development of antibiotics also illustrates the long time lapses involved in establishing a concept. In addition he found that the duplication of discoveries reported in a country was highest in reports published in that

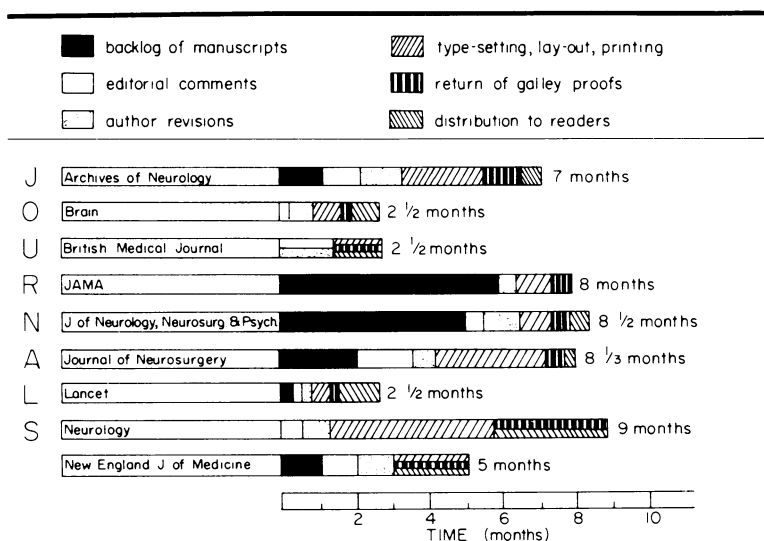


FIG. 2—Time lapses in clinical journals.

TABLE 1  
 L-DOPA TREATMENT FOR PARKINSONISM

1958	Carlsson, A. <i>et al.</i> On the presence of 3-hydroxytyramine in brain. <i>Science</i> 127: 471.
1962	Birkmayer, W., and Hornykiewicz, O. Der L-dioxyphenylalanine (= L-DOPA) Effekt beim Parkinson-syndrom des Menschen zur Pathogenese und Behandlung der Parkinsonakinese. <i>Arch. Psychiatr. Nervenkr.</i> 203: 560.
1962	Barbeau, A. <i>et al.</i> Les catécholamines dans la maladie de Parkinson. In: Ajuriaguerra, J. de, ed. <i>Monamines et Système Nerveux Central</i> . Genève, Georg, p. 247-262.
1963	Hornykiewicz, O. Die topische Lokalisation und das Verhalten von Noradrenalin und Dopamin (3-hydroxytyramin) in der substantia nigra des normalen und Parkinsonkranken Menschen. <i>Wien. Klin. Wochenschr.</i> 75: 309.
1966	Poirier, L. J. <i>et al.</i> Striatal amines, experimental tremor and effect of harmaline in monkey. <i>Brain</i> 89: 37.
June 1967	} Cotzias, G. C. <i>et al.</i> Progress reports given at various society meetings.
Sept. 1967	
Apr. 1968	
May 1968	
Feb. 1969	Cotzias, G. C. <i>et al.</i> Modification of Parkinsonism—chronic treatment with L-Dopa. <i>N. Engl. J. Med.</i> 280: 337.
Nov. 1969	Cotzias, G. C. Parkinsonism and dopa. <i>J. Chronic Dis.</i> 22: 297.
June 1970	L-Dopa is approved to treat Parkinsonism. FDA Current Drug Information.

country and that the number of cases of duplication was highest in the same year as the publication of the original report.

Publication speed seems most important to the worker attempting to keep abreast of new findings and to avoid duplication of research efforts. He is eager to discover new ideas and techniques to benefit his own research. This is especially a problem for the new worker who is starting research in a particular area and has not become a member of that area's "invisible college."

After reviewing the results of the present survey and reading recent articles concerning information dissemination and journal publication, it becomes apparent that the role of the journal is changing. These recent articles tend to agree that there are three basic functions of a journal: recording information, disseminating information, and conveying prestige and recognition. Historically, disseminating information and conveying prestige and recognition are most important. Today, there is an emphasis on informal means of communication as the major agents for rapid dissemination of information, while the journal's main functions are recording information and conveying prestige and recognition. However, for those outside of a particular "invisible college" the journal serves as a major medium for disseminating news. Those within the "invisible college" may take advan-

tage of the technological advances in communications media. They can gain pertinent information quickly by telephoning the appropriate researchers or meeting with them at scientific meetings. Both word-of-mouth communication and transportation facilities are of course more readily accessible now than in the past.

Before speculating on future modes of information dissemination a few of the methods being tested today are worthy of comment. The most commonly used practice is the "Letters" or "Short Communications" sections of journals such as *JAMA*, the *British Medical Journal*, and the *Journal of Neurochemistry*. These sections offer preliminary announcements of work, with brief descriptions of new concepts, ideas, or techniques. It is understood that the material will be reported in full as journal articles later. Several physical sciences journals (*FEBS Letters*, *Journal of the Chemical Society*, *Chemical Communications*, *Radiochemical and Radioanalytical Letters*) publish separate issues called "Letters," rather than adding them to a regular journal, as a means of decreasing the time lapse. Journals like the *British Medical Journal* and *Lancet*, containing mainly short articles, reduce the time lapse and may be viewed as similar to the separately published "Letters."

Because readers wish to spend less time

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scanning journals with irrelevant articles, there are services being offered in the physical sciences like the Mathematical Offprint Service and Single Article Service by the American Chemical Society Publications Division. The Mathematical Offprint Service offers to the "individual on a continuing basis reprints and/or title listings of articles which satisfy the criteria specified in his interest profile. In addition to the interest profile, the subscriber indicates authors whose works he specifically wishes to receive or exclude, fields of primary and secondary interest, languages, and journals from which he does not wish to receive articles or titles" (16). The Single Article Service by ACS Publications Division reproduces and distributes to subscribers the table of contents of the society's research journals. The subscribers can then order reprints of any articles listed (17).

Another method for overcoming delays and time-wasting irrelevant articles is the publication of two-edition journals. The two-edition journal combines: (1) desirability of a more concise and efficient personal subscription journal and (2) the accessibility of full papers. One edition is aimed at a broad readership by emphasizing the "core" information, including key experimental data and discussion in short articles written by the authors. The other edition is for limited circulation to libraries and contains the complete papers. The edition with the complete papers can be placed on microfilm or microfiche cards to facilitate storage. Thus far, the ACS has had some success with this method. They hope as researchers become more accustomed to using microforms, and as long as production costs are kept within reason, that the two-edition journal will become more popular (18, 19).

Today the use of audiovisual materials as information disseminators has mushroomed. Cassette tape recorders are perhaps the most popular. At scientific and society meetings it is common to see a researcher walking along the exhibits talking into a microphone attached to a small tape recorder, or recording the presentation and discussion of a paper. Thus, he has an accurate, up-to-date account of the events and thoughts of that meeting without waiting for the published proceedings. Some national societies have realized the importance of using tapes as an information medium and have

begun to offer tape service. For example, the AMA offers the *Audio News Journal* which covers scientific news on treatments, techniques, and drugs; reviews major medical journals; and carries interviews with scientific exhibitors and leading speakers at medical conventions. Subscriptions cost about \$40 per year and entitle the subscriber to one sixty-minute tape a month.

In planning further modes of information dissemination to correct some of the ills of the present system, one must reevaluate the purposes of the various levels of information dissemination (whether it be rapid dissemination or archival storage) and then decide the functions of each level. Several authors (Bever of NIH; Brown, Pierce, and Traub of Bell Telephone Laboratories in New Jersey; and Herschman of AIP) have agreed that future information disseminators will be based on the concept of the "duality of quick and [of] archival communication" (20).

One communication mode is the selective dissemination of information according to group profiles, the journal still being distributed to libraries for archival and reference purposes, but with individuals receiving separate articles according to their group interests. In other words, the journal articles will be repackaged to maximize their relevance to readers. Brown, Pierce, and Traub have devised such a system. The readers have several options in receiving information according to their interest profiles. A few of the options are: preprint option in which a subscriber receives both preprints and final papers; abstracts only, in which one receives only abstracts of papers with the provision that one can order full papers later; or the specified author or institution option; and citation option (Table 2). In this system the author submits his paper and list of relevant subject headings taken from a prescribed vocabulary list. A computer matches the reader's interest profile with the author lists of subjects. Readers then get printouts according to the options chosen (21).

Arthur Herschman has proposed a very futuristic mode of information dissemination. He envisions the day when each researcher or clinician will have an interactive terminal built into his desk. The terminal will have the "capabilities of querying the public file as if it were a public library and being used as a key to

TABLE 2  
SUBSCRIBER'S OPTIONS

Options	Contents
Preprints	Preprints + final papers
Abstracts	Abstracts only (complete papers available upon request)
Titles	Titles only (complete papers available upon request)
Panoramic	Broad papers incorporating several fields
Specified author	Papers written by a particular author
Specified institution	Papers written by persons in a particular institution
Citation	Papers citing a particular article

his private mail box with all of the assurances of first class mail." The user in his role as an author will transmit his manuscript to the mail box of the appropriate editor or to private mail boxes of any other correspondents. After scanning his private file of authors, the user in his role as an editor will transmit the manuscript with appropriate comments to the mail box of a referee. Then after some interchange among the editor, referee, and author, the editor has the authority to transmit the accepted manuscript to the public file. If the manuscript is rejected, the author has the option to send it to another, hopefully more sympathetic, editor. Once the manuscript is in the public file, it is available for use by the analyzer (information service) to put into the appropriate SDI (Selective Dissemination of Information) or current awareness channels. Also, the manuscript information is available to the user in his role as an evaluator for digestion into a compilation or review. Lastly, the user can just browse through the system, reading articles of interest (22).

In planning future information dissemination systems one must identify the types of users and their needs. For example, clinicians desire "sifted, succinct information for immediate, bread-and-butter utilization" (23), while basic scientists desire articles with much more technical detail. Thus, in light of these divergent needs one sees the limitations of the journal as an information disseminator of the future. In the future the recording of information—the

archival function of the journal—may become most significant. The priority establishment function will be fulfilled partly by future modes of information dissemination. The journal and other information disseminators are having to undergo a change in philosophy in order to meet more effectively and efficiently the demands of readers swamped by the information explosion. A distinction must be made between rapid information dissemination and archival information since media trying to serve both current awareness and storage functions perform neither very effectively.

The problem of time lapses in journal publication represents, thus, only one portion of the dilemma concerning the dissemination of new information after research has been completed. Continuous reevaluation of functions of the journal and other information disseminators will contribute to a solution of the problem of time lapses in information dissemination.

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