Editorial

Medline Obsolescence

"Freedom of the press is guaranteed only to those who own one."

–Abbott Joseph Liebling
New Yorker, May 4, 1960

By excluding the *Journal of Orthomolecular Medicine* and certain other journals from its Medline/PubMed indexing services, the U.S. National Library of Medicine (NLM) has limited doctors' access to information. At one time, limits were understandable; only 239 journals were indexed when Medline first went online in 1971. Medline became freely available on the Internet in June of 1997, and now, ten years later, indexes over 5,000 journals. Interestingly, it is the Internet itself that has made Medline obsolete. The 'net offers numerous search engines and indexing services for professionals and public alike. Preeminent among these is Google Scholar.

Google Scholar

The meteoric rise of Google over the last decade has helped people instantly access a substantial proportion of the world's knowledge. As Google has become more successful, it has diversified into specialist areas. One of its more recent search engines, Google Scholar (http://scholar.google.com), is now a primary resource for scientists and academics.

Google Scholar indexes Medline itself, but this constitutes only a fraction of its information base. Google Scholar will also show web pages for a journal, the authors, and frequently an independent PDF copy of the article itself. Furthermore, Google Scholar allows libraries and publishers to index their collections, including abstracts and direct links to obtain the complete article. Google Scholar also indexes government sites, university lecture notes, academic presentations, scientific conferences and, potentially, any relevant material available or linked to the Internet.

With the advent of Google Scholar, medical information access has reached a tipping point.[1] It is no longer possible for agencies such as NLM to control rapid access to journals it chooses to exclude. Those who want information can find it just as fast via Google Scholar as they can with Medline, and Google Scholar is far more comprehensive. That is why, for many researchers, Google Scholar provides the initial portal for online searches. Google Scholar indexes the Journal of Orthomolecular Medicine. Indeed, any Internet search engine can find the new online JOM archives at http://orthomolecular.org/library/jom.

The French Institute of Scientific and Technical Information (Cat.inist) searches "about 13 million bibliographic records of documents held in the INIST/CNRS collections and covering all fields of worldwide research." (http://international.inist.fr/rubrique4.html) It is provided by the Centre National de la Recherche Scientifique, part of France's Ministry of Research, the largest fundamental research organization in Europe. INIST indexes the Journal of Orthomolecular Medicine. And, among its more than 20,000 journals, so does British Library Direct (http://direct.bl.uk/bld/Home.do).

EBSCOhost (http://www.epnet.com/titleLists/aw-complete.htm) and the Allied and Complementary Medicine Database (AMED) (http://www.bl.uk/collections/health/amed.html) also index JOM.

But not the U.S. National Library of Medicine. To be fair, it must be admitted that in May 2007, NLM acknowledged that it does have JOM on its shelves, saying in correspondence:

"While we hold the Journal of Orthomolecular Medicine in our print collection here at NLM, it is not currently indexed for MEDLINE/PubMed."

One might well wonder why NLM, a taxpayer-supported public library, physically archives a journal, and yet refuses

to index it. JOM Associate Editor Harold Foster has wryly observed that "Medline treats the Journal like a dirty magazine: to be read privately, but the fact kept hidden from the public."

The Old Information Age

Researchers have found it hard to publish research on nutritional medicine since the 1960s. Abram Hoffer, a psychiatrist with a PhD in biochemistry, reported that content, not quality, of research was the primary disqualification. For example, a representative of the Journal of the American Psychiatric Association told Hoffer that the journal would never publish articles from his group. In response, the US and Canadian Schizophrenia Associations started the Journal of Schizophrenia, later the Journal of Orthomolecular Psychiatry, to provide a vehicle for research into nutrition and psychiatry. As interest in nutritional medicine expanded, the name was changed to the Journal of Orthomolecular Medicine.

NLM's reluctance to index JOM may be historical, rooted in the controversy ensuing from Linus Pauling's promotion of vitamin C. Notably, Pauling coined the term orthomolecular in an influential paper to Science in 1968.[2] However, if Hoffer is correct that Medline excludes journals based on content, then medical practitioners and scientists interested in the therapeutic uses of nutritional substances are being denied access to the relevant literature. Papers in this and related disciplines are indexed only when published in journals such as *Medical Hypotheses*, which Medline deems acceptable.

Medline is a selective filter, aimed at physicians and academics who are too busy to manually trawl the literature. The benefits are obvious, the dangers less so. In legal matters, defendants would be ill served if their attorneys relied on an electronic database of some court cases. In medical research, progress depends on the availability of a broad range of information. If sources are limited, then searches are biased and patients will suffer.

Medline limits access to scientific data by exercising control over which journals it includes. Bland extraneous publications, like Reader's Digest or The Times newspaper, are included. Conversely, important publications that show maverick tendencies, such as the Journal of American Physicians and Surgeons, Medical Veritas, and the Journal of Nutritional and Ecological Medicine, are excluded from Medline. The idea that the *Reader's Digest* is of greater clinical utility than these journals is clearly absurd.

NLM excludes journals by employing a Literature Selection Technical Review Committee (LSTRC). Since Medline's inclusion criteria are vague, committee members exercise a high degree of subjective choice.[3] Proposers of rejected journals receive the results of a simple point system, without detailed justification of the reasons for exclusion. There are no hearings, no public input, and no appeal mechanism to challenge the decision.

Members of the LSTRC are selected, privately, for eminence in particular fields of study. Such selection is an established method for biasing group decisions.[4,5] In legal cases, both prosecution and defense lawyers have the right to exclude jurors.[6] Neilson and Wilson studied the effectiveness of such "peremptory challenges".[7] They found that if the defendant belongs to a minority group, and wrongful conviction charges are large, then it may be optimal to allow the defense to exclude more jurors. By analogy, a minority view such as orthomolecular medicine should be given fair representation on the committee. In fact, orthomolecular medicine does not have any representation on NLM's Literature Selection Technical Review Committee.

Selection of Medline review committee members allows them to be chosen

to represent a particular viewpoint. For example, avoiding indexing journals in the orthomolecular field might involve selecting doctors with a disdain of alternative and complementary medicine. All committee members are appointed by NLM. Notably, when asked, NLM was unable to provide details of any committee member with a background in orthomolecular medicine.[8] This suggests that, at best, the Medline committee lacks experience in the fields it is reviewing.

The New Information Age

Until recently, Medline's suppression of publications, such as the journal Fluoride (the journal of the International Society for Fluoride Research), was a powerful restriction of data that challenged the medical status quo. However, the advent of the Internet has opened up vast informational resources to the public. This explosion of data availability is unstructured and largely uncensored. The result is an abundance of health information sources of widely variable quality.

Until recently, most patients had limited access to medical information and, to a greater or lesser extent, were subject to screening and interpretation by medical practitioners. Nowadays, however, it is possible for patients to truly be more informed about their disease and its treatment than their doctor is. This changes the doctor-patient relationship. A major criticism of such increasing patient empowerment is the lack of quality control on the Internet. Even if patients find an accurate site, they may not have sufficient understanding or experience to apply the information to their particular condition.

The counter-argument has been described as the "wisdom of crowds", which is related to the cybernetic concept of requisite variety.[9,10] Surprisingly, it has been shown that a population of independent agents can be more effective at analyzing data than any single expert.[11,12] This finding underpins economic free market systems. Any single person might be mistaken, but, on average, a diverse group of independent individuals can present a more accurate and complete interpretation of the available data. Abraham Lincoln was right: you cannot fool all of the people all of the time.

Those physicians complaining about patients accessing the Internet for information may be chastened by the thought that, on average, their patients may be more right than wrong. Such "wisdom of crowds" effects have promoted and sustained orthomolecular medicine since its inception.

Medline's Dominance Ends

When it began in 1971, Medline was the only game in town. We are now witnessing the end of Medline's era as the premiere source of medical information. While it remains heavily used, it is fast losing its dominance to Google Scholar. Given time, additional indexing services will enhance delivery of information to doctors, scientists and medical professionals.

Authors can overcome censorship of individual journals by publishing elsewhere or by starting their own journals. However, scientists' careers depend on the visibility of the papers they publish. Medline exerted a powerful disincentive for career-minded scientists to submit papers to excluded journals. Journals indexed by Medline have had greater prestige. Inclusion of a paper in Medline meant that it would be noticed more easily, and referenced more often. Medline was not just censoring the journal's output; it was also preventing papers being submitted to excluded journals.

The U. S. National Library of Medicine appears to have forgotten that human beings are historically intolerant of censorship, and have rarely responded

positively to it. "In the long run of history," wrote Alfred Whitney Griswold, "the censor and the inquisitor have always lost."[13]

We are now entering a new era of medical informatics. The wide availability of information on the safety and effectiveness of nutritional therapies is changing health care. People have tried orthomolecular medicine for themselves and found it effective. Before too long, the wisdom of patients, backed by the pressure of hundreds of millions of Goggle Scholar searches, may drag conventional doctors, kicking and screaming, into the orthomolecular information age.

It will be a birth worth attending.

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