

The evolution of *The Cochrane Library*, 1988-2003

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Synopsis

Cochrane reviews are now a highly regarded source of evidence about the effects of healthcare interventions, partly because they are regularly updated as more information becomes available and in response to comments and criticisms. *The Cochrane Database of Systematic Reviews*, one of the components of *The Cochrane Library*, has evolved from earlier electronic publications of Cochrane reviews, some of which were first published in 1988. This article documents the evolution of *The Cochrane Database of Systematic Reviews* and *The Cochrane Library* between 1988 and 2003, showing how they were conceived as electronic publications from the outset, and designed to take advantage of features unique to electronic publishing.

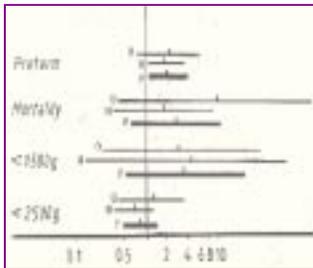
Introduction

Since 1996, systematic reviews prepared and maintained by the Cochrane Collaboration have been published in *The Cochrane Library*, along with bibliographic and quality-assessed material on the effects of healthcare interventions submitted by others. Cochrane reviews have been published in one of the components of *The Cochrane Library*, *The Cochrane Database of Systematic Reviews*. These reviews are regularly updated as more information becomes available and in response to comments and criticism. They are now widely regarded as being of better quality, on average, than their counterparts in print journals (Jadad et al. 1998).

The development of the Cochrane Collaboration has been described elsewhere (Chalmers 1993; Chalmers and Haynes 1994; Bero and Rennie 1995; Chalmers et al. 1997; Dickersin and Manheimer 1998; Chalmers 2003), but the evolution of *The Cochrane Library* has not previously been documented. As many of the systematic reviews now appearing in *The Cochrane Database of Systematic Reviews* were first published electronically in 1988, this seems likely to be the longest running electronic publication in the field of health care. Here we look at the evolution of *The Cochrane Library* as an electronic publication between 1988 and 2003, and some of the features that set it apart from more traditional publications.

A letter to the Lancet, 1986

By the mid 1980's, people had begun to recognise that it was impossible to interpret the results of any one study in isolation, and that critical summaries were needed to put the results into context. Indeed, it began to be realised that, because a systematic approach to assessing research on the effects of healthcare interventions was not being used, patients were suffering and dying unnecessarily. These preventable tragedies were illustrated dramatically in a comparison of advice in textbooks and the information that could have been available had a scientifically defensible approach been used to cumulate evidence as it emerged (Antman et al. 1992).



In 1979 Archie Cochrane had issued a call to assemble “a critical summary, adapted periodically, of all ... relevant randomized controlled trials” (Cochrane 1979), and one of the fields in which people had begun to heed this call by the mid-1980s was perinatal medicine. Work had begun on developing registers of controlled trials of interventions during pregnancy labour and early infancy (Grant and Chalmers 1981; Chalmers et al. 1986), and the advantages of a more systematic approach to reviewing evidence about the effects of healthcare interventions, sometimes combining data from similar studies to create an overall estimate

of effect, had also been demonstrated, both in ‘stand alone’ reviews (Chalmers 1979), and in setting the results of new studies in context (Saunders et al. 1985). The stage was set at the National Perinatal Epidemiology Unit in Oxford to coordinate the creation of a body of systematic reviews in pregnancy and childbirth.

Advances in computer technology were making it possible to consider more ambitious projects. LexisNexis had shown the legal profession the advantages of bringing together reference literature in a database format, and electronic publication held the promise of new ways of assembling and delivering information.

With the earlier example from the perinatal field in mind (Saunders et al. 1985), a letter to the Lancet published in August 1986 (Chalmers 1986) applauded the editor’s decision to include a “lengthy tailpiece” putting in context the results of the very large ISIS-1 trial (ISIS-1 Collaborative group 1986), which had been preceded by many other trials addressing the same question. The letter acknowledged that this was difficult to do in a print journal because of lack of space, and noted the advantages that electronic publication had to offer. Space is limited in printed journals, consequently the amount of detail that can be included in the background and methods sections, as well as in the presentation of results, is restricted. Recognition that the electronic world was not limited in this way allowed people to consider new approaches to

presenting and summarising of research evidence. One such approach, heralded in the letter to the Lancet, was *The Oxford Database of Perinatal Trials*.

The Oxford Database of Perinatal Trials (ODPT)



The first electronic publication to present regularly updated systematic reviews of research on the effects of healthcare interventions was *The Oxford Database of Perinatal Trials* (Chalmers 1988) - known to many affectionately as “Odd Pot” (ODPT).

ODPT was funded by Oxford University Press as part of an ambitious project at the UK’s National Perinatal Epidemiology Unit to systematically review the effects of care in pregnancy and childbirth. Drawing on the experience and success of the *Classified Bibliography of Controlled Trials in Perinatal Medicine* (National Perinatal Epidemiology Unit 1985), ODPT initially sought to provide registers of perinatal trials to “provide a resource for reviews of the safety and efficacy of interventions used in perinatal care...” (Chalmers et al. 1986).

A computerised register of randomised controlled trials in perinatal medicine had been designed and developed earlier (Mugford et al. 1982). ODPT went beyond storing bibliographic information on the clinical trials that formed the material for systematic reviews. In an innovative step, ODPT was expanded to include:

- raw data from the clinical trials, i.e., the results of the trials, and
- commentaries on the analyses, i.e., the full text of the systematic reviews themselves.

In addition, ODPT was conceptualised as a publication in its own right. The database became one of a trio of complementary products to emerge from the National Perinatal Epidemiology Unit and published by Oxford University Press. These products, all based on the trial registers and systematic reviews, included in addition to ODPT, the 2-volume reference work *Effective Care in Pregnancy and Childbirth* (Chalmers et al. 1989), and a paperback, reader-friendly version stripped of statistics and references, *A Guide to Effective Care in Pregnancy and Childbirth* (Enkin et al. 1989). This was a powerful collection, of direct relevance to practitioners, pregnant women and their families, researchers, policy makers and others interested in pregnancy and childbirth.

ODPT was a valuable addition to the printed work. Published twice yearly, first on 5¼ inch and then on 3½ inch diskettes, it had several advantages as an electronic publication, not the least of which was that the systematic reviews could be maintained and updated after the books had gone to print. Distribution of ODPT on a subscription basis also provided the opportunity to circulate newsletters highlighting new or substantially revised reviews (see *Spring Newsletter* 1992).

Structured documents

ODPT was developed using a popular microcomputer database program based on the “dBase” file specification. The reviews were not held as documents *per se*. Instead, a relational database was used, and the data were stored in a highly structured form. All references, for example, were held in one file, while all author’s names and affiliations were held in another. Similarly, the titles of all comparisons in the analyses were held together, as were the data extracted from each of the included studies. As a consequence, the systematic reviews themselves were highly structured, and were all in the same format.

The systematic reviews in ODPT were known as “overviews” to distinguish them from the ongoing, planned, unpublished and published trial reports that were also included in the database. As the term suggests, overviews were summaries of groups of studies evaluating similar interventions. Each overview had a designated ‘editor’, who provided a structured textual summary termed the ‘Editorial Commentary’.

The overviews in ODPT were data orientated. Data on different outcomes following the

interventions studied were considered 'Parts' of the overview, and within each Part, where possible and appropriate, the software would display the data from each included study and produce a statistical summary or meta-analysis. The analyses were based on the notion of calculating odds ratios from the outcome data of the individual trials, and then pooling the odds ratios to get an overall estimate of effect (cf. [Saunders et al. 1985](#)).

This highly structured approach to presentation gave the reader an important advantage: once you understood how to read one graph and how to interpret a couple of statistics, you could apply that understanding to all reviews in the database. This removed one of the big barriers between research and practice, namely the effort required to figure out how the researchers had analysed the data and had reached their conclusions. The process was transparent and consistent for the reviews presented in *ODPT*.

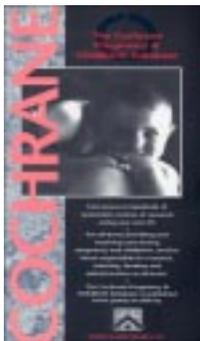
Consistent analysis and data presentation

Unlike more traditional printed articles, the *ODPT* database system allowed the raw data used in the meta-analyses to be stored with the article, which in turn meant that statistics could be calculated and figures drawn in 'real time', that is, when the figure was displayed. As new studies were added to the database, and new data became available, they were automatically incorporated in the analyses.

One interesting feature when displaying meta-analyses in *ODPT* was that you could watch the pooled effect estimate and confidence interval change as each trial was added into the analysis, the ordering being based on the assessed quality of each study, its statistical power, or its year of publication.

Storing the data with the reviews also meant that when it came time to produce the graphs for the 2-volume book *Effective Care in Pregnancy and Childbirth* ([Chalmers et al. 1989](#)), a software program could be written to step through the database and produce the graphs and figures for delivery to the publisher. The data published in printed form represented a 'time-slice' or 'snap-shot' of the state of research evidence at the time of submission for publication.

The Cochrane Pregnancy and Childbirth Database (CCPC)



By 1992, many policy makers, practitioners, and consumers had come to recognise the importance of systematic reviews for making decisions about health care. The books *Effective Care in Pregnancy and Childbirth* ([Chalmers et al. 1989](#)) and *Effective Care of the Newborn Infant* ([Sinclair & Bracken 1992](#)) were acknowledged as important achievements within the profession, and *A Guide to Effective Care in Pregnancy and Childbirth* ([Enkin et al. 1989](#)) in paperback had proved popular with professionals and non-professionals alike.

The Oxford Database of Perinatal Trials ([Chalmers 1992](#)) was being maintained at the National Perinatal Epidemiology Unit, and an international team of contributors was updating the systematic reviews. As the editors of

ODPT recounted at the time:

"If we had the opportunity to begin again from the beginning, we might well have decided that, before any attempt was made to prepare either of the books, all of the systematic reviews on which they were based should have been completed, with structured reports prepared, and held in electronic form." (Millbank Quarterly Special Issue 1993).

Although the books had proved popular, Oxford University Press found the electronic publication costly to maintain, and in the end concluded that it was not economically viable. In 1992, Oxford University Press decided to discontinue *ODPT* as a commercial product.

While it was hoped that central funding could be obtained to support the dissemination of the

database, this was not to be the case. In the United Kingdom, supporting the production of systematic reviews was recognised as a legitimate use of research and development money, but the dissemination of systematic reviews was not. In addition, plans were being made to create a national Centre for Reviews and Dissemination, but the exact remit of the Centre was undecided. These two factors contributed to the decision by the National Health Service Research and Development Programme not to fund dissemination, and so commercial models were again pursued.

It was still early days in the history of electronic publishing. The World Wide Web had yet to gain popularity, and attempts to interest other publishers in taking over the publication of *ODPT* were not successful. The most likely successor to *ODPT* at the time was an ambitious project known as 'Medical Knowledge', which was to be a publication under the auspices of the newly formed Maxwell Electronic Publishing. This project ended following Robert Maxwell's death in 1991 (<http://news.bbc.co.uk/1/hi/business/1249739.stm>).

Personal computer technology was changing quickly in the early 1990s, and access to desktop computers was becoming commonplace. In 1992, Update Software redesigned *ODPT* in an attempt to bring the systematic reviews to the forefront, and to make the information more accessible to the average computer user. The result was that in April 1993, Update Software reissued the systematic reviews contained in *The Oxford Database of Perinatal Trials* as an electronic publication entitled *The Cochrane Pregnancy and Childbirth Database (CCPC)*.

At the same time, the then recently established Research and Development Programme of the UK National Health Service had recognised the value of the work being done at the National Perinatal Epidemiology Unit and provided funds for a new centre, the UK Cochrane Centre, to promote an extension of the process to other areas of healthcare. The development and launch of *CCPC* thus coincided with the opening of the UK Cochrane Centre in October 1992, and planning for the launch of the international Cochrane Collaboration in October 1993. *CCPC* was designed in part as a pilot to show how Cochrane Reviews in all areas of healthcare could be published electronically. The original title of the publication was the "Cochrane Collaboration Pregnancy and Childbirth database", hence the double 'C's in *CCPC*.

The reviews in *CCPC* were organised under topics following the natural progression of pregnancy and childbirth, from "Care during pregnancy" to "Unhappiness after childbirth". Each review included a summary graph displaying the pooled effect measure for each outcome included in the review. This meant there was a single figure, generated directly from the stored data, which summarised the review. The software allowed the user to start at the beginning of the database, and, using the PageDown key on the computer keyboard, display each summary graph in turn until the end of the database was reached. By 1994, Issue 2, there were 615 reviews included in *CCPC*.

The highly structured nature of the reviews in *CCPC* allowed for very specific search and retrieval facilities. It was possible, for example, to search on the entry characteristics for the studies reviewed (for example, women who had had Caesarean sections), the intervention reviewed (for example, Caesarean section), and/or the outcome measured (for example, number of women having Caesarean sections after induction of labour).

When the second edition (Enkin et al. 1995) of *A Guide to Effective Care in Pregnancy and Childbirth (GECPC)* was commissioned, the editors were able to start at the top of the topic list and step through the database summarising the evidence available under each topic. One immediate benefit of the relationship between the database and the book was that it allowed linking the individual reviews to text from the relevant chapters. That is, while reading a review on screen, a single keystroke allowed the reader to display the relevant chapter of the book. For example, the review "Upright versus recumbent position during the second stage of labour" was linked to the *GECPC* Chapter 2, 'The Second Stage of Labour', which includes a discussion of position during labour.

CCPC proved very popular and sold over 1000 copies in the first year, which was remarkable given that it was still early days in electronic publishing. It was especially popular among midwives and others who did not have ready access to the research literature. Including the text from *GECPC* in the electronic publication was a significant contribution, in part because it provided those not familiar with the research literature with a context in which it could be

interpreted.

The Cochrane Database of Systematic Reviews (CDSR)



The Cochrane Collaboration was inaugurated in October 1993, but it continued to be difficult to interest publishers in an exclusively electronic publication. The most promising discussions were with the American Association for the Advancement of Science (AAAS), which had just launched an electronic journal named the *Online Journal of Current Clinical Trials* (hosted by OCLC – Online Computer Library Center, Inc; [click here](#) for a description of the Online Journal). The idea was to create a separate section for Cochrane Reviews in the *Online Journal of Current Clinical Trials*. It was proposed that authors prepare the documents electronically, and, once approved by the appropriate Cochrane Review Group, the reviews would be sent electronically and automatically published on the OCLC system. These discussions ultimately failed to progress, in part because of the legal implications of AAAS and OCLC publishing ‘sight unseen’ material from international sources over which they had no editorial control.

Update Software continued to develop a system for managing and disseminating registers of trials and systematic reviews, and by October 1994, at the 2nd Cochrane Colloquium in Hamilton, Ontario, Canada, Update Software demonstrated a prototype of a new CD-ROM publication, *The Cochrane Database of Systematic Reviews (CDSR)*.

The Cochrane Collaboration was, and continues to be, a loose-knit organisation. It is based on the enthusiasm of people wishing to contribute and does not have an easily defined membership. The CD-ROM publication provided a means of communication among those interested in the work of the Collaboration, as well as an outlet for the work of the Collaboration. The CD-ROM listed contact details of all groups in the Collaboration, including the reference Cochrane Centres for all countries in the world. It also included listings of titles of planned reviews, and protocols for reviews in preparation.

CDSR continued the tradition established with *CCPC*, where authors retained copyright and were encouraged to publish articles in print journals based on the reviews held in electronic form. In keeping with the spirit of Collaboration, and as an incentive to publish, each author was given a complimentary subscription to the CD-ROM publication.

Authoring tools: ODMAN, RevMan and ModMan

The original information management system supporting the Oxford Database of Perinatal Trials was a program named the Oxford Database Manager (*ODMAN*). This started the ‘manager’ naming convention that has persisted to this day. *ODMAN* was maintained at the National Perinatal Epidemiology Unit in Oxford, UK, and all data were entered and reviews created on this one system.

With the development of the Cochrane Collaboration, it became clear that the resources were not available for a centralised management system. “Let a hundred flowers bloom” was the sentiment of the time. The Cochrane Collaboration was committed to building on the enthusiasm of individuals. In response to this new organisation, Update Software introduced a review authoring tool, the *Review Manager* (RevMan), that was intended to allow individuals to produce the highly structured reviews that featured in *ODPT* and *CCPC*. The information management system was designed to mirror the structure of the Collaboration, where systematic reviews produced by individual authors were authored in *RevMan*, and then sent to the editorial bases of Collaborative Review Groups where they were assembled into modules of reviews using a *Module Management* program (*ModMan*). The modules were then sent to Update Software where they were assembled to form a *Parent Database* from which publications could be derived.

This system has remained intact for 10 years now and the software programs supporting the

system remain virtually unchanged. *RevMan* was first released in July 1993 (*RevMan* 1.03 for DOS) followed by versions 2 and 3 in November 1995 and October 1996, respectively. Interim versions have been released subsequently but it was recognised that a period of stability was desirable and so no major changes were made for a couple of years. At present, *RevMan* 4.2 is available without charge on the Internet at <http://www.cochrane.de/cochrane/revman.htm>.

In 1997, Update Software gave the Information Management System to the Collaboration, and the Nordic Cochrane Centre took over responsibility for maintaining *RevMan*. A few years later, in 2001, the Nordic Cochrane Centre assumed responsibility for developing *ModMan* as well. The *RevMan* software has always been freely available and has been used widely to produce systematic reviews outside the Cochrane Collaboration.

The great advantage of using the authoring tool was that all documents had the same structure and the different parts of the document could be readily identified and independently manipulated. This allowed them to be transformed into different formats for different publishing systems. Over the years, Cochrane Reviews have appeared as ASCII text, in MARC formats (www.loc.gov/marc), using Standardized General Markup Language (SGML), HyperText Markup Language (HTML), and Extensible Markup Language (XML; see <http://www.w3.org/> for information on standard technologies for Web publishing), as well as proprietary formats for specialised products.

The Cochrane Library



It was clear from the start of the Cochrane Collaboration in 1993 that it would be many years before the majority of reliable research studies assessing the effects of healthcare interventions could be placed in the context of a systematic review. It was also clear that the Cochrane Collaboration was not the only group producing high-quality reviews.

In addition, while the management software supporting *The Cochrane Database of Systematic Reviews* helped to create structured reviews in many different clinical areas, it was missing one essential element: the register of trials that provided the source material for the systematic reviews.

In 1995, Update Software convened an advisory group that recommended creating a library of information sources to inform decision-making in healthcare and to help in the production of systematic reviews. David Sackett, then Chair of the Cochrane Collaboration, welcomed the suggestion and authorised its implementation by Update Software. Thus it was that, in April 1996, Update Software presented the first issue of *The Cochrane Library*. This incorporated:

- Regularly-updated systematic reviews and protocols for reviews in preparation, in the *Cochrane Database of Systematic Reviews* (contributed by the Cochrane Collaboration)
- Quality appraisals of reviews published elsewhere, in the *Database of Abstracts of Reviews of Effectiveness* (contributed by the UK National Health Service Centre for Reviews and Dissemination)
- A register of controlled trials, in the *Cochrane Controlled Trials Register* (assembled by Update Software from registers submitted by Cochrane Centres and Cochrane review groups, together with entries downloaded from MEDLINE and Embase)
- A register of articles on the science of reviewing evidence (contributed by the Oslo branch of the Nordic Cochrane Centre)
- Information about the Cochrane Collaboration (assembled from material supplied by the Cochrane Collaboration)

The first three of these collections were viewed as part of a hierarchy of evidence, ranging from

regularly updated reviews, to high-quality reviews published elsewhere, to reports of individual controlled trials. The intention was to extend this range to include planned and ongoing trials (cf. [Chalmers et al. 1986](#)) and topic summaries such as those from the *Guide to Effective Care in Pregnancy and Childbirth* (cf. *CCPC*).

The Cochrane Library was accessed using specially written software that allowed rapid searching of all documents in the collection, while distinguishing between types of documents when reporting the results of the search. That is, after entering search criteria, the user was shown the number of regularly updated systematic reviews that met the criteria, followed by the number of reviews published elsewhere, then the number of trial reports, and so forth. This design was intended to emphasise the differences between the types of documents retrieved by a search strategy, a design now known as a “thematic approach to information retrieval” and was unusual at the time.

MetaView



The Cochrane Library used a novel approach to presenting figures and graphs, and further developed the strategy of separating the data themselves from displays of the data. In most scientific publications, figures and graphs are stored as images. *The Cochrane Library* broke with this tradition and continued the strategy first used in ODPT - storing raw data with the Cochrane Reviews and generating figures and graphs in ‘real time’, that is, at the time when they were displayed. In the case of *The Cochrane Library*, this was accomplished by developing a specialised program named MetaView that acted as a “data viewer”. MetaView was included with the authoring tool RevMan to allow the review authors to calculate statistics and view figures and graphs. MetaView was also included with the CD-ROM and later Internet versions of *The Cochrane Library*, which meant not only that readers of reviews could view the same figures and graphs as the authors, but they could select different statistics and manipulate the data as well.

Technically, this was a very efficient method of publishing figures and graphs. By 2003 there were almost 35,000 graphs with over 100,000 trial outcomes with numerical data to be displayed. The numerical data needed to create a graph could be transmitted far more rapidly than the graph images themselves, and the space saved by storing numerical data allowed the database to be published on CD-ROM.

This approach was criticized by some statisticians ([Senn 2000](#)), who argued that the average reader would not know what statistics were appropriate to a given data set (e.g., odds ratio or relative risk; fixed effect or random effect analysis), and in recent years reviewers have had the option of setting a default analysis.

Comments and criticisms

Each completed review and review protocol appearing in *The Cochrane Library* includes contact details for both the reviewer(s) and the Collaborative Review Group responsible for the review. Readers were encouraged from the outset to use these contacts if they had criticisms or suggestions for how the review might be improved. Comments on review protocols provide a form of ‘pre-publication’ feedback on how the reviewers plan to conduct the review. Comments made ‘post-publication’ provide a mechanism for ongoing feedback on such topics as the methods used, the questions addressed, and the conclusions reached. Reviewers and review group editors take these comments into account when updating the reviews. By updating reviews in response to comments and criticisms, mistakes can be corrected and the overall quality of the review will continue to improve.

Update Software launched a formal ‘Comments and Criticisms’ system for Cochrane Reviews at the 4th Cochrane Colloquium in Adelaide, Australia, in 1996. In its current form, the system allows readers to post comments to a Web site from links in the reviews, the abstracts of reviews, or directly (see links in the review abstracts at www.update-software.com/cochrane/abstract.htm). Once posted, a copy of the comment is automatically forwarded to the Collaborative Review Group responsible for the review and to a Criticism Editor, who in turn passes the comment or a summary of the comment to the appropriate reviewer. When the review is updated, either the comment or the Criticism Editor’s summary of

the comment along with the reviewer's reply is published as part of the updated review. Reviewers, editors and others may also reply to the comment directly on the Web site.

Dissemination

Update Software distributed *The Cochrane Library* from January 1997 to March 2003. The dissemination strategy, as agreed with the Cochrane Collaboration, was to make *The Cochrane Library* available directly to subscribers, and to prepare the reviews and other resources for those wishing to disseminate the material on other platforms.

In September 1996, for example, *The Cochrane Database of Systematic Reviews* was made available on the World Wide Web in partnership with Synapse Publishing Inc. Update Software worked with Ovid Technologies to prepare data for use in *Evidence Base Medicine Reviews*, launched in October 1998.

Similarly, the World Health Organisation sponsored the *WHO Reproductive Health Library*. This highly successful disk-based product disseminated a selection of Cochrane reviews relevant to developing countries, together with practitioners' comments on the applicability of the reviews in different practice settings. *Evidence-based medicine guidelines* presented treatment recommendations backed by evidence summaries and the full text of Cochrane Reviews. This allows a 'drill-down' approach where readers can examine for themselves the evidence on which treatment recommendations had been based.

By 2003, Cochrane Reviews were available from most major information providers, including Dialog and DataStar, EBSCO, SilverPlatter and Ovid. Open access over the Internet was provided in several countries, including Australia, Finland, Ireland, Norway and the United Kingdom. *The Cochrane Library* was also made available throughout Latin America and the Caribbean through the BIREME system, and to all low- and low-middle countries as defined by the World Bank, through the HINARI, INASP and TALC programs.

Discussion

Evidence-based healthcare in general, and systematic reviews in particular, have achieved widespread recognition in the years since ODPT was first published 1988. In 2003, for example, the "Grady Filters" on the Emory University Health Libraries Web site retrieved over 8500 systematic reviews, including health-technology assessments, when used on PubMed.

Although no longer unique, Cochrane reviews remain distinctive because their electronic publication allows two key features difficult to achieve with traditional print media:

- (1) because there are no practical constraints on space, systematic reviews published electronically can include more transparently details of background, materials and methods, data presentation and analysis, which would often have to be omitted in print documents.
- (2) reviews published electronically can be updated as new information becomes available and when mistakes or other ways of improving them are identified. This makes it possible to produce a reference work that is continually improving in content and quality.

Although there are a great number of electronic publications available on CD-ROM and over the Internet today, most of these contain 'papers' originally intended for print journals. In general, the electronic versions of the major medical journals have been judged to be very much like their print counterparts, and in many respects have failed to live up to expectations (Delamothe 2002).

The Cochrane Library differs from traditional publications in that it was conceived as an electronic publication from the outset, and was designed to take advantage of features unique to electronic publishing. It illustrates how an electronic publication was developed in its own right to improve the quality and relevance of published reports of scientific information. Cochrane reviews are now widely cited in policy documents and practice guidelines (Holmes et

al. 2001). Hopefully they will also be used increasingly to improve the quality of Discussion sections in reports of new research on the effects of health care (Clarke et al. 2002). In these ways, *The Cochrane Library* has helped and should continue to help ensure that healthcare interventions do more good than harm.

Chronology

See also: [Chronology of the Cochrane Collaboration](#)

1974	Card file of references to controlled trials in perinatal medicine established; MEDLINE search strategy designed and implemented monthly
1978	Grant provided by Maternal and Child Health Unit, WHO, Geneva, enabling systematic hand-search for reports of perinatal trials to begin
1979	First overview (meta-analysis) of perinatal trials published (Chalmers 1979).
1980	Introduction of pilot classification system for perinatal trials
1982	Microcomputer funded by WHO for storage of information about registered trials in a database Publication of a book reviewing controlled trials of antenatal care, but without using meta-analysis (<i>Effectiveness and Satisfaction in Antenatal Care</i>)
1983	Development of software for manipulating searches of the database of perinatal trials more flexibly
1984	Implementation of amended classification system for perinatal trials and coding of more than 3000 trials
1985	Publication in the <i>Lancet</i> of a report of a controlled trial of hospital admission for bed rest in twin pregnancy, with the results of the new trial set in the context of a systematic review of all the relevant evidence (Saunders et al. 1985) Publication of a ' <i>Classified Bibliography of Controlled Trials in Perinatal Medicine 1940-1984</i> ', in book form Grant from Oxford University Press to develop database for eventual release as an electronic publication
1986	Development of database of perinatal trials documented in <i>Controlled Clinical Trials</i> and <i>WHO Chronicle</i>
1987	Software of database of perinatal trials 'beta-tested'
1988	Publication of ' <i>Oxford Database of Perinatal Trials (ODPT)</i> ' (Version 1.0, Disk Issue 1) Publication of the first in a series of overviews (meta-analyses) in the <i>Br J Obstet Gynaecol</i>
1989	Publication of ' <i>Effective Care in Pregnancy and Childbirth (ECPC)</i> ' Publication of ' <i>A Guide to Effective Care in Pregnancy and Childbirth (GECPC)</i> ' 'ODPT' Disk Issues distributed 6-monthly
1990	Development and introduction of structured editorial commentaries for overviews published within ' <i>ODPT</i> '

	Publication of the first in a series of Commentaries for the <i>Br J Obstet Gynaecol</i> based on overviews (meta-analyses) published electronically
1991	<p>Finalisation of team of obstetric and midwifery reviewers for pregnancy and childbirth</p> <p>Introduction of 4-page newsletters published with each 6-monthly disk issue of 'ODPT'</p> <p>Publication of an account of 'ECPC' and 'ODPT' in <i>'The Future of Medical Journals'</i> (a book marking 150 years of the BMJ)</p>
1992	<p>Publication of <i>'Effective Care of the Newborn Infant (ECNI)'</i></p> <p>Final Disk Issue of 'ODPT' published</p> <p>'The Cochrane Centre' opens in Oxford, UK</p>
1993	<p>Update Software reissues <i>'The Oxford Database of Perinatal Trials (ODPT)'</i> as an electronic journal entitled <i>'The Cochrane Pregnancy and Childbirth Database (CCPC)'</i></p> <p>Update Software releases Version 1 of Review Manager (RevMan)</p> <p>Formal launch of the Cochrane Collaboration at the 1st Cochrane Colloquium, in Oxford, UK</p>
1994	First public demonstration of <i>The Cochrane Database of Systematic Reviews</i> , designed by Update Software
1995	<p><i>The Cochrane Database of Systematic Reviews</i> launched in London by the English Minister for Health</p> <p>Cochrane Collaboration registered as a Company and a Charity under English law</p>
1996	<i>The Cochrane Library</i> launched by Update Software as a quarterly publication on CD-ROM and disk, incorporating <i>The Cochrane Database of Systematic Reviews</i> , <i>The Database of Abstracts of Reviews of Effectiveness</i> , <i>The Cochrane Controlled Trials Register</i> and <i>The Cochrane Review Methodology Database</i> . This was the first issue to use Hypertext Markup Language (HTML) to display Cochrane Reviews
1997	Cochrane Collaboration signed an agreement with Update Software recognising <i>The Cochrane Library</i> as the main outlet for its work, while agreeing that Update Software would prepare datasets for anyone wishing to publish Cochrane Reviews on other platforms
1997	Electronic Comments and Criticisms System launched within <i>The Cochrane Database of Systematic Reviews</i>
1998	<p><i>The Cochrane Library</i> made available on the World Wide Web on Update Software's Internet server.</p> <p>Ovid launched <i>Evidence Based Medicine Reviews</i>, linking Cochrane Reviews to MEDLINE records</p>
2001	Richard Smith and Iain Chalmers describe their vision of a "Medline of synthesised, reliable, and up to date evidence" comprising <i>Clinical Evidence</i> , <i>The Cochrane Library</i> and the <i>metaRegister of Controlled Trials</i> , and propose that the British government fund universal free access (Smith and Chalmers, 2001)
2002	Open access to <i>The Cochrane Library</i> on the Internet provided in several countries, including Australia, Finland, Ireland, Norway and the United Kingdom.

	Public Internet access also provided throughout Latin America and the Caribbean through the BIREME system, as well as in all low- and low-middle income countries as defined by the World Bank through the HINARI , INASP and TALC programs
2003	The Cochrane Collaboration contracts with John Wiley & Sons to commercially market and distribute Cochrane reviews and other Collaboration output

References and links

Antman EM, Lau J, Kupelnick B, Mosteller F, Chalmers TC (1992). A comparison of results of meta-analyses of randomized control trials and recommendations of clinical experts. *JAMA*;268:240-48. [[PubMed](#)]

Bero L, Rennie D (1995). The Cochrane Collaboration: preparing, maintaining and disseminating systematic reviews of the effects of health care. *JAMA* 274:1935-1938. [[PubMed](#)]

Chalmers I (1979). Randomised controlled trials of fetal monitoring 1973-1977. In: Thalhammer O, Baumgarten K, Pollak A, editors. *Perinatal Medicine*. Stuttgart: Georg Thieme:260-265.

Chalmers I (1986). Electronic publications for updating controlled trial reviews. *Lancet* 2:287. [[Free full text](#)]

Chalmers I, editor (1988 – 1992). *Oxford Database of Perinatal Trials*. Oxford: Oxford University Press.

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[ODPT1988.ZIP - Oxford Database of Perinatal Trials, 1988 version 1.0](#)

For screen shots from the program, see:

<http://www.update-software.com/history/odpt.htm>

Chalmers I (1993). The Cochrane Collaboration: preparing, maintaining, and disseminating systematic reviews of the effects of health care. *Ann N Y Acad Sci* 703:156-65. [[PubMed](#)]

Chalmers I (2003). The prehistory of the UK Cochrane Centre. In: Bosch X, editor. *Back to the front*. Barcelona.

Chalmers I, Enkin M, Keirse MJNC (1989). *Effective Care in Pregnancy and Childbirth*. Oxford: Oxford University Press.

Chalmers I, Haynes RB (1994). Reporting, updating, and correcting systematic reviews of the effects of health care. *BMJ* 309:862-865. [[Free full text](#)]

Chalmers I, Hetherington J, Newdick M, Mutch L, Grant A, Enkin M, Enkin E, Dickersin K (1986). The Oxford Database of Perinatal Trials: developing a register of published reports of controlled trials. *Controlled Clinical Trials* 7:306-324. [[PubMed](#)]

Chalmers I, Sackett DL, Silagy C (1997). The Cochrane Collaboration. In Maynard A, Chalmers I, editors. *Non-random reflections on health services research*. London, BMJ Publishing Group:231-239. [[Book Review](#)]

Clarke M, Alderson P, Chalmers I (2002). Discussion sections in reports of controlled trials published in general medical journals. *JAMA* 287:2799-2801. [[PubMed](#)]

Cochrane AL (1972). *'Effectiveness and Efficiency: random reflections on health services'*. London: Nuffield Provincial Hospitals Trust. [[Description and ordering information](#)]

Cochrane AL (1979). 1931-1971: a critical review, with particular reference to the medical profession. In: *Medicines for the year 2000*. London: Office of Health Economics:1-11.

Delamothe T (2002). Is that it? How online articles have changed over the past five years. *BMJ* 325:1475-1478. [[Free full text](#)].

Dickersin K, Manheimer E (1998). The Cochrane Collaboration: Evaluation of health care and services using systematic reviews of the results of randomized clinical trials. *Clin Obstet Gynecol* 41:315-331. [[PubMed](#)]

Enkin M, Keirse MJNC, Chalmers I (1989). *A Guide to Effective Care during Pregnancy and Childbirth*. Oxford: Oxford University Press. [[Free full text of most recent edition](#)]

Enkin M, Keirse MJNC, Renfrew MJ, Neilson JP (1993). *A Guide to Effective Care during Pregnancy and Childbirth*, 2nd edition. Oxford: Oxford University Press. [[Free full text of most recent edition](#)]

Enkin M, Keirse MJNC, Renfrew MJ, Neilson JP (1994). *The Cochrane Pregnancy and Childbirth database*. Oxford: Update Software Ltd., Disk Issue 2.

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[CCPC1994.ZIP - The Cochrane Pregnancy and Childbirth Database](#)

Grant A, Chalmers I (1981). Register of randomised controlled trials in perinatal medicine. *Lancet* 1:100.

Holmes L, Lusher A, Chalmers I (2001). Citation of Cochrane Reviews in national and international guidelines and policies, reports of the NHS Health Technology Assessment Programme, *Effective Health Care*, Finnish Evidence-Based Medicine Guidelines, and *Clinical Evidence*. UK Cochrane Centre.

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ISIS-1 Collaborative group (1986). Randomised trial of intravenous atenolol among 16 027 cases of suspected acute myocardial infarction: ISIS-1. *Lancet* ii: 57-66. [[PubMed](#)]

Jadad AR, Cook DJ, Jones A, Klassen TP, Tugwell P, Moher M, Moher D (1998). Methodology and reports of systematic reviews and meta-analyses: a comparison of Cochrane reviews with articles published in paper-based journals. *JAMA* 280:278-280. [[PubMed](#)]

Mugford M, Grant A, Chalmers I (1982). Developing a register of randomized controlled trials in perinatal medicine. In Lindberg DAB, Reichertz PL, editors. *Lecture notes in medical informatics*. Berlin: Springer-Verlag:162-167.

National Perinatal Epidemiology Unit (1985). *A classified bibliography of controlled trials in perinatal medicine 1940-1984*. Oxford: Oxford University Press.

Saunders MC, Dick JS, Brown I, McPherson K, Chalmers I (1985). The effects of hospital admission for bed rest on the duration of twin pregnancy: A randomised trial. *Lancet* 2:793-795. [[PubMed](#)]

Senn S (2000). Review is biased. *BMJ* 321:297. [[Free full text](#)]

Sinclair JC, Bracken M (1992). *Effective Care of the Newborn Infant*. Oxford: Oxford University Press.

Smith R, Chalmers I (2001). Britain's gift: a "Medline" of synthesised evidence. *BMJ* 323:1437-1438. [[Free full text](#)]