

## Discover: Pharmaceutical Information

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Discovering user's information needs and expectations is a vitally important step when working in any specialised subject area, none more so than in the field of pharmaceutical information. Adjusting search and sourcing strategies accordingly can save unnecessary time and expense, given the rising cost of subscriptions for periodicals and new media and the inherently expensive nature of niche pharmaceutical monographs and reference tests. The needs of the health professional pharmacist are generally accommodated via primary sources (specialist medical journals in particular), and, it should not be forgotten, informal 'delphic' information sources. But what about other users? Differing needs have traditionally converged around certain key reference sources in book/CD-ROM form and computerised abstract/index services. Now the Internet is becoming another focal point - its potential as a 'one-stop shop' for both technical and non-technical pharmaceutical information is being realised, albeit slowly. This article, then, has two aims: to cover both traditional and new sources and to offer something for everyone.

### **IDENTIFICATION OF DRUGS**

Searching for information on drugs is complicated by the fact that every drug has three names. A drug's *chemical* name describes its chemical composition and molecular arrangement. A drug's *nonproprietary* or *generic* name is unique, chosen by its original manufacturer/agency using guidelines issued by the appropriate nomenclature committee who will ultimately approve it. The generic name may often reflect its chemical composition. A drug's *trade* or *brand* name is the name under which it is marketed. This can vary across countries and so it is possible for the same generic drug to have many trade names. It is also worth noting that drugs are sometimes referred to by their class, eg *antihistamine*.

When using any of the three names above, other factors may need to be taken into account such as variant spellings (American, British and International), synonyms and unusual capitalisations. Help is at hand though, in the form of publications like *Saunders Pharmaceutical Word Book* which attempts to take into account all of the above and *Pharmacological and Chemical Synonyms* which lists internationally accepted names of drugs, pesticides and compounds, cross-referenced with alternate, proprietary or chemical names.

Drugs may also be identified in other ways. For example, before being given a generic name, drugs have an identification code assigned to them by the manufacturer. They may have a patent number. Once indexed by the *American Chemical Society*, they will be accorded a CAS Registry Number. However, the increasing sophistication, power and size of computerised indexing/abstracting services is helping to overcome these kind of identification obstacles.

### **ABSTRACTS/INDEXES**

A recent study by Brown (1998)<sup>1</sup> has shown that pharmaceutical information retrieval from *EMBASE*, the online equivalent to *Excerpta Medica*, is superior to *MEDLINE* (*Index Medicus*) in terms of the number of unique citations for a given search. *EMBASE*, unlike *MEDLINE*, permits searches using specific drug identifiers or brand and manufacturer names. Both databases do allow CAS Registry Number searching although Brown stresses caution when using these with *MEDLINE*. Ultimately, given that *MEDLINE* covers more US related material and *EMBASE* has a strong European and Far Eastern emphasis, an exhaustive search using both databases would be ideal, other factors permitting.

A similar conclusion was reached by Fishman, Stone and DiPaula (1996)<sup>2</sup> in their study comparing searches made using *International Pharmaceutical Abstracts* (*IPA*), and *MEDLINE*. Produced by the *American Society of Health-System Pharmacists* (*ASHP* and available from *SilverPlatter* on CD-ROM, *IPA* specialises in pharmaceutical literature covering amongst other subjects: clinical and technical drug information, pharmacy practice, pharmaceutical education, and legal aspects of pharmacy and drugs. As well as drawing on over 750 journals, *IPA* now includes presentation abstracts from major *ASHP*'s meetings and the *APhA* and *AACP* annual meetings. *ASHP* also intends to include abstracts of approved Masters and Doctor theses for degrees offered through schools of pharmacy. It is this kind of coverage which explains why *IPA* has a generally small overlap of citations with *MEDLINE* and is able to produce unique citations for certain searches and topics. That is why Fishman et al recommend comparing descriptors in the indexes of both databases in order to determine which one is more appropriate for the search in hand.

UK hospital pharmacists have developed their own CD-ROM database to pharmacy-related research papers called *Pharmline*. It does not have as a sophisticated interface as *Silverplatter WebSpirs* products, something which limits search-refining and makes cross-referencing more time-consuming. *BIOSIS* is an online service renowned for its coverage of pharmacological literature, incorporating data from 6,500 life science journals as well as numerous review articles and books. It is available from several European hosts, eg *EDINA* in the UK. *Chemical Abstracts*, accessible via *STN International* is one of the best means of accessing chemical and patent information on a drug via a patent code and/or CAS Registry number. With *CAS Scifinder* and *Scifinder Substructure Module* (*SSM*), this type of information can now be accessed direct from the desk-top by inputting a chemical substructure. Clearly, further research is needed to produce a detailed comparison of the effectiveness of these abstracting/indexing services.

One of the most rapid current awareness services relevant to pharmaceutical information is *Current Contents: Life Sciences*. Available from the *Institute for Scientific Information*, it is published weekly in paperback format and contains author, title, source and bibliographic information only, ie without abstracts. *Monthly Index of Medical Specialities* (*MIMs*) is considered to be a major source of updated drug information in the UK and mention should also be made of the UK's national drug information bulletins: the *Medicines Resource Centre Bulletin* (*MeReC Bulletin*) compiled by drug information pharmacists and the *Drug and Therapeutics Bulletin* (*DTB*) compiled by the *Consumer's Association* which aim to disseminate brief, referenced reviews of new products and therapeutic areas to the busy health professional.<sup>3</sup>

## PHARMACOPOEIA/FORMULARIES

Pharmacopoeial specifications are the standards for pharmaceutical products in a given country, acting as a publicly available quality control and, as such, are an essential source of pharmaceutical information. *The European Pharmacopoeia* is available in English and French language versions and contains around 1200 monographs on drug substances. EEC member states' pharmacopoeias complement it but are not a subset of it. *The British Pharmacopoeia*, for example, contains over 2,000 monographs for substances and articles used in the practice of medicine, in two volumes. Volume I contains monographs for medicinal and auxiliary substances and the infrared spectra, while Volume II deals with formulated preparations, blood products, immunological; products, radiopharmaceutical preparations and surgical materials. A new edition appears quinquennially. *Martindale, The Extra Pharmacopoeia* is another important reference work as it aims to provide unbiased, evaluated information on drugs and medicines on a *world-wide* basis. This is based on previously published information and some 26,000 references are included; in an attempt to cover important drug studies and place these in context. Good for herbal and homeopathic medications. All of the above are now available in CD-ROM format. Some publishers are now offering special 'bundle' rates for subscribers who opt for both book and CD-ROM versions. It is worth checking whether subscriptions include annual updates and addenda. Formularies vary from country to country. The British version is revised twice a year and is paper-back guide to dispensing. *The British National Formulary* is also now available in a CD-ROM version (*eBNF*).

## OTHER DATABASES

The *Iowa Drug Information File (IDIS)* available on-line from *Ovid Technologies* contains bibliographic records to articles on human drug therapy published in over 180 biomedical journals. Each record describes the drugs, diseases, and clinical concepts reported in the article. IDIS features controlled vocabulary indexing with over 6,600 specific drug terms, and over 2,400 disease/condition terms. Over 100 descriptor terms index the age group of the study population, study design, treatment efficacy, dosage, administration techniques, pharmacokinetics, pharmacodynamics, pharmacoeconomics, pharmaceuticals, incompatibilities, drug interactions, toxicology, and side effects. Animal studies are not covered, however. *Chapman & Hall's Combined Chemical Dictionary on CD-ROM* contains their dictionaries of organic compounds; natural products; inorganic and organometalli compounds; pharmacological agents and analytical reagents. It features around 30,000 compounds for drug and pharmacological agents alone and claims to include all currently marketed drugs under most generic names as well as those undergoing current clinical trials. It allows both text and chemical structure searching. Finally, it is worth taking a look at *MICROMEDEX* products. Their *Computerised Clinical Information System (CCIS)* combines *DRUGDEX* - a collection of drug monographs; *POISINDEX* - a comprehensive source for poison control information, including management of poisonings and the very useful *IDENTIDEX* - the final link in drug identification as it identifies drug delivery systems by imprint code or visual characteristics. All of these resources are available individually.

## CORE REFERENCE BOOKS

The main stays of pharmaceutical literature are revised continually, testifying to their reputation and research value. Annotated guides to suggested tertiary literature already exist, notably *Walford's guide to reference material* and a long section in the *Keyguide to information sources in pharmacy*. Key texts include *The Pharmaceutical Codex: Principles and Practice of Pharmaceutics* aims to provide a source of reference for the pharmaceutical science of the development and provision of active dosage forms. The development of drug delivery systems and quality issues are also covered. *The Merck Index* contains a collection of some 10,000 monographs covering a wide range of drugs and pharmaceuticals, common organic chemicals, and laboratory reagents and naturally occurring substances and plants. It also contains physical and chemical properties, trade names and patent numbers. *The Pharmacological basis of therapeutics* is acknowledged to be a standard pharmacology reference work as is *Meyley's Side Effects of Drugs: An Encyclopedia of Adverse Reactions & Interactions* for toxicological subjects. *Remington's Pharmaceutical Sciences* is the standard treatise on the theory and practice of pharmaceutical science broken down into orientation, pharmaceutics, pharmaceutical chemistry, testing and analysis, radioisotopes, pharmaceutical and medicinal agents, biological products, pharmaceutical preparations and their manufacture and pharmaceutical practice. The section on agents in particular is thorough. UK readers are recommended Turner, Volans and Wiseman's *Drugs Handbook*. Published annually, it is a handy, quick reference guide to current trade names, approved drug names and definitions of drug group names. It also retains information on obsolescent drugs which still hold therapeutic, toxicological or pharmacological interest.

## INTERNET SOURCES

Farmer and van Hengel (1994)<sup>4</sup> suggest that although public libraries are unlikely to be able to cater for all specialised drug information needs, given their limitations of a wide consumer base and limited resources, they could fulfill a wider role as a referral service to a more appropriate information source. Using a simple browser and the following sites, the Internet can help realise that role, and not just for public libraries. One common element of these sites is the 'Russian doll effect' - they all contain (mostly unique) links to other pharmacy related sites. The time needed to sift through and evaluate the sites is a precious commodity though and the usual caveats should be heeded - an potential bias towards American information, the ephemeral nature of certain private sites and the reliance on English language material. *PharmInfoNet* is very thorough with some excellent links to biotechnology, drug information, drug research and development sources as well as to general medical and governmental resources. It also contains links to pharmaceutical associations and companies and pharmacy schools. *Virtual Library Pharmacy* has an excellent list of pharmacy related mailing lists. The University of Manchester, UK has established *PharmWeb* - an open-access pharmaceutical information database and directory of pharmacy information resources. As well as containing links to the major international pharmaceutical associations, it also offers the very useful *PharmWeb directory* - a searchable world-wide directory of people working in pharmacy and related areas. *PharmWeb* has mirror-sites for easier European access. *The Centre for Medical Research International (CMRI)* home-page is worth a visit for information on the very latest

drug research on a world-wide basis. Founded in 1981 and based in the UK, it is an internationally-recognised not-for-profit organisation, funded by the research-based pharmaceutical industry world-wide. Its mission is 'to provide unique data as well as expert analyses to address technical, medical, economic, regulatory and policy issues in the discovery, development and safe use of medicines.' Importantly, it has links to most regulatory bodies and regulatory information across the world. In order to gain the European perspective on the pharmaceutical industry and its regulatory framework, try the web-pages of the *European Agency for the Evaluation of Medicinal Products (EMA)*. With *Adobe Acrobat Reader* installed, the various directories of legislation (*Eurdalex*) and authorised products *Community Register of Medicinal Products* can be searched and viewed in full-text. It also contains news on important new directives and initiatives which will affect the sector. Another useful on-line database is *Inter-Pharm* which provides contacts for a whole range of world-wide pharmaceutical support services from advertising through to translating via information services.

## NEW DRUG INFORMATION

Given the high amount of investment in R&D that is required to produce a new pharmaceutical product, pharmaceutical companies are understandably protective of the fruits of their research. A trawl of 'grey' literature is one way of accessing this kind of pharmaceutical information. The *Pharmaprojects* databases available from *Ovid online* enable just that, reporting on pharmaceutical products under development in all major markets by over 800 companies. International journals, business newsletters, conference proceedings, stock brokerage and annual reports and publications are all scanned for inclusion. *Pharmaprojects Current (PHAR)*, updated monthly, follows the progress of compounds from the laboratory through all phases of clinical development to registration and worldwide launch. It includes the latest news on the development and licensing status of each compound and a digest of relevant chemical, pre-clinical and clinical details. When products are considered to be no longer in development in any major markets, their documents are moved to either the *Pharmaprojects Launched Product File (PHAP)* or, if discontinued, to the *Pharmaprojects Discontinued Product File (PHAB)*. All 3 databases can be searched via *Pharmaprojects (PHAZ)*.

The UK Cochrane Centre prepares, collects and disseminates systematic reviews of randomized controlled trials in the form of *The Cochrane Controlled Trials Register (CCTR)* available on CD-ROM. It aims to be an unbiased source of data and also include sources not covered fully by other databases such as *MEDLINE*. Finally, sites like *CenterWatch* can be used to keep an eye on what's happening in trials across the Atlantic.

## FURTHER READING

One of the best and most thorough guides to pharmaceutical information in all its forms in the 1990s is *Information Sources in Pharmaceuticals*. Particularly apposite is the chapter on pharmaceutical information needs and availability in Western Europe. *Drug information - a guide for pharmacists*, although aimed at the American market, does detail useful American products and has some very useful appendices including a list of useful tertiary and secondary resources for commonly requested drug

information, filed by type of inquiry. Although nearly 15 years old, Revill's *Drug Information Sources* is still a valuable resource, both for its comprehensive section containing international professional/trade associations and publications indexed by country (Afghanistan to Zimbabwe) and for its selection of literature chosen from the pharmaceutical manufacturer's viewpoint. Strickland-Hodge et al's (1989) work is a solid piece of work with a good historical perspective and, inter alia, a list of recommended English/Non-English language primary sources. *The Pharmacist's Directory and Yearbook 1997-98* has some very useful contact details for pharmaceutical related organisations including veterinary pharmaceutical companies. It is, however, aimed at the UK reader.

Finally, on a personal note, I would urge readers not to overlook research undertaken as part of degree and higher degree programmes within the higher education institutions of their own countries. So much time and research goes into this work only to end up untouched on library shelves.

The author would like to thank Simon Jackson and King's College London Library.

[Boxed text] **INTERNET ADDRESSES**

**Ad Referendum**

[http://www.info-med.co.uk/adref/pharm/ph\\_t.htm](http://www.info-med.co.uk/adref/pharm/ph_t.htm)

**CenterWatch**

<http://www.centerwatch.com>

**Chapman Hall - Electronic Publishing Division**

<http://www.chaphall.com> CHECK!

**The Cochrane Collaboration**

<http://www.update-software.com/ccweb/default.html>

**InterPharma**

<http://interpharma.co.uk>

**Micromedex Inc**

<http://micromedex.com> CHECK!

**Molecular Biology & Pharmacology Links**

<http://www.uic.edu/~durand/molbiol.htm>

**Ovid Technologies**

<http://ovid.com>

**PharmInfoNet**

<http://pharminfo.com/phrmlink.html>

**PharmWeb**

<http://www.pharmweb.net>

**Silverplatter**

<http://silverplatter.com>

**STN International**

<http://www.fiz-karlsruhe.de/stn.html>

**US Food & Drug Agency - Center for Drug Evaluation & Research**

<http://www.fda.gov/cder/>

**University of Cambridge: Department of Pharmacology**

<http://www.phar.cam.ac.uk>

**Virtual Library Pharmacy**

<http://www.cpb.uokhsc.edu/pharmacy/pharmint.html>

**World Health Organisation**

<http://www.who.ch>

**Worldwide List of Pharmacy Schools**

<http://orchid.phrm.cf.ac.uk/WWW-WSP/SopListHomePage.html>

[boxed text] **SELECTED CONTACTS**

**Association of the British Pharmaceutical Industry**

12 Whitehall, London, SW1A 2DY

Tel: +44 (0)171 930 3477

Email: [abpi@abpi.org.uk](mailto:abpi@abpi.org.uk)

<http://www.abpi.org.uk>

**British Library SRIS**

25 Southampton Buildings, London WC2A 1AW, UK

Tel: +44 (0)171 412 7494/7496

Email: [sris-centre-desk@bl.uk](mailto:sris-centre-desk@bl.uk)

<http://portico.bl.uk>

**Centre for Medicines Research International**

Woodmansterne Road, Carshalton, Surrey, SM5 4DS, UK

Tel: +44 (0)181 643 4411

E-mail: [information@cmr.org](mailto:information@cmr.org)

<http://www.cmr.org/>

**The European Agency for the Evaluation of Medicinal Products**

7 Westferry Circus, Canary Wharf, London, E14 4HB, UK

Tel: +44 (0)171 418 8400

<http://www.eudra.org>

**Institute for the Study of Drug Dependence Library & Information Service**

Waterbridge House, 32-36 Loman Street, London SE1 OEE

Tel: +44 (0)171 928 1211

**Institute for Scientific Information**

3501 Market Street, Philadelphia, Pennsylvania 19104, USA

Tel: +1 215 386 0100

**International Pharmaceutical Federation (FIP)**

Andries Bickerweg 5

2517 JP The Hague

The Netherlands

Tel: (31) 70 363 1925

<http://www.pharmweb.net/pwmirror/pw9/fip/pharmweb92.html>

**Royal Pharmaceutical Society of Great Britain**

1 Lambeth High Street, London, SE1 7JN

Tel. +44 (0)171 735 9141

Email: [info.rpsgb@dial.pipex.com](mailto:info.rpsgb@dial.pipex.com)  
<http://www.rpsgb.org.uk/>

**Royal Society of Chemistry Library & Information Centre**

Burlington House, Piccadilly, London, W1V 0BN

Tel: +44 (0)171 437 8656

Email: [LIBRARY@RSC.ORG](mailto:LIBRARY@RSC.ORG)

<http://chemistry.rsc.org/lic/library.htm>

**Royal Society of Medicine Library**

1 Wimpole Street, London W1M 8AE, UK

Tel: (+44) (0)171 290 2900

Email: [library@roysocmed.ac.uk](mailto:library@roysocmed.ac.uk)

<http://roysocmed.ac.uk>

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2 vols. Gordon Press Publishers: 1991. 0849045711

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P. Weller. The Pharmaceutical Press: 1997. 0853693862

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<sup>1</sup> BROWN, C. The benefits of searching EMBASE versus MEDLINE for pharmaceutical information. *Online & CD-ROM Review*, 1998. 22(1) pp.3-8.

<sup>2</sup> FISHMAN, D., STONE, V, DIPAUOLA, B. Where should the pharmacy researcher look first? Comparing International Pharmaceutical Abstracts and MEDLINE. *Bulletin of the Medicial Library Association*, 1996. 84(3) pp.402-408.

<sup>3</sup> See: SMITH, J. Drug information bulletins, an analysis of citations. *Journal of Information Science*, 1996. 22(5) pp.375-380.

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<sup>4</sup> FARMER, J. & VAN HENGEL, J. Drug information for patients - do we know the answer? *Journal of Documentation*, 1994. 50(4) pp.333-338.