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First Intercountry Workshop on National Drug Information Services

Chennai, India, 8-11 May 2007



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1. Introduction

The first Intercountry Workshop on National Drug Information Services was held in association with the Karnataka State Pharmacy Council, Bangalore from 8-11th May 2007 in Chennai.

The general objective of the workshop was to strengthen drug information services in five selected South Asian countries

The specific objectives were:

- (1) To review the functioning of Drug Information Services in the five selected countries of the Region..
- (2) To provide hands-on experience in drug/health information retrieval.
- (3) To formulate plans for regional collaboration in drug information activities.

Participants from Bhutan, India, Maldives, Nepal, and Sri Lanka who were pharmacists and doctors attended the workshop.

2. Opening remarks

The Regional Adviser, Essential Drugs and Medicines WHO, Regional Office for South-East Asia (SEARO) Dr K. Weerasuriya, delivered the message from Dr Samlee Plianbangchang, Regional Director, WHO South-East Asia Region

Dr Plianbangchang said that medicines are one of the most cost-effective interventions for improving health. The concept of Essential Drugs was enunciated in 1975 and given practical shape as the List of Essential

Drugs in 1977. This list is revised every two years. Providing appropriate information for the rational use of medicines is a key component to achieving their full potential. However, the complex nature of the varied stakeholders and their sometimes contradictory objectives are barriers to providing information.

Dr Plianbangchang added that medicines are a commodity that is subject to market forces; it is a highly profitable commodity producing a high rate of return. It is therefore understandable why those involved in its production and sale would try to influence the decision as to what medicines are prescribed and sold.

The Regional Director further elaborated that when information on medicines is looked at from the perspective of health, there should be only one objective – information to prescribe the correct medicine using the generic name, in the correct dose, for the correct duration with affordability in mind, and with the appropriate information being provided to the patient or consumer. To achieve this, drug information should be evidence-based, scientifically driven and unbiased. Scientific literature, which should be the basis for this evidence, should be specified as a part of transparency. If clear recommendations cannot be made, the evidence must be presented for the prescriber to make the correct and appropriate decision.

Drug information activities are in various stages of development in countries of the Region. However, all countries have the potential for establishing an independent drug information service useful to their particular situations. This could be in the health ministry itself, or in collaboration with partners such as a department of pharmacology in a faculty of medicine or institutions such as pharmacy councils. Even with limited resources there is sufficient evidence-based, scientifically driven, unbiased information that a drug information service could use to provide useful and relevant information to their health-care professionals.

This workshop would also present an opportunity for sharing country experiences on the existing drug information services. Finally, participants could share regional experiences in drug information such as regional licenses (for full text of address, see Annex 1).

3. Drug information

3.1 Drug information services: Australia

Mr Graeme Vernon gave an overview of drug information centre (DICs)¹ in Australia. He said that a drug information center offers direct advice to health professionals and/or consumers. This advice should extend beyond the approved product information and can involve unlicensed indications, dosages and routes of administration. New information that can guide drug therapy should be available and a drug information pharmacist should be able to interpret this information to improve patient care. Areas that require particular care include patients who take multiple drugs, those with co-morbidities, children, as well as pregnant and lactating women. Drug information services are well placed to work with therapeutic advisory committees and pharmacovigilance programmes.

In Australia, most DICs are located in hospitals and associated with clinical pharmacy programmes. The National Prescribing Service (NPS) is an independent, government-funded organization to promote the quality of medicines for patient care and consumer education. The NPS provides a toll-free telephone service for primary care practitioners. Separate lines are provided for adverse medical events. A psychotropic drug advisory service is also available. NPS also funds a dedicated telephone service for consumers. A list of drug information services is available on the web site of the Society of Hospital Pharmacists of Australia (www.shpa.org.au).

Medline is the most important bibliographic database for drug information practice. It is important that drug information specialists understand how the database is indexed and know how to perform structured searches to obtain a focused set of literature citations. Allowing PubMed to create a search strategy will not utilize the full potential of subject headings, subheadings and limits. Particular care is required when searching for drugs that do not have medical subject headings (MeSH).

Access to full-text medical literature has increased in recent years but significant deficiencies still impede clinical information support in many countries. Full text is necessary for a critical analysis of published research

¹ A Drug Information Centre is considered to be a specific organisation/entity dedicated to providing drug information. When drug information is provided as a part of general service (e.g. from a department of pharmacology in a university), it is considered a drug information service. The activities in the entire health services are referred to as drug information services.

reports and the details may be required to safely transfer the results of research to clinical practice. It is equally important to have access to independent sources of clinical information support. Examples include *Micromedex*, *MedicinesComplete*, *Therapeutic Guidelines* and the *British National Formulary (BNF)*. Sources of evidence-based medicine, such as Cochrane Reviews, provide comprehensive selections of good-quality research and meta-analyses of the overall data. Piracetam is an example of a drug used following ischaemic stroke in Asian countries but not in the US, UK or Australia. A recent Cochrane analysis of available evidence did not support its use for this indication. The evidence necessary to support the confident use of many drugs is lacking and there are regional differences in drug use, which may have arisen through limited access to the medical literature and the skills required for a critical analysis of all the available data.

Assessing new drugs is difficult because these drugs are heavily promoted before prescribers have an opportunity to assess the drug in clinical practice or make comparative assessments. Advertising to health professionals is not always supported by adequate data, and drug information practitioners should be able to critically analyse promotional material.

Quality assurance is an important component of a credible drug information service. Seeking feedback from enquirers can only provide a general perspective of a service. The best approach to check the quality of responses is through peer review from colleagues (external drug information specialists or medical practitioners).

3.2 Drug information services: United Kingdom

Ms Rachel Kenward provided an overview of the structure and function of the Medicines Information Service in the United Kingdom.

The United Kingdom Medicines Information Service (UKMi) is a National Health Service (NHS)-funded, pharmacy-based service available to all health-care professionals in primary and secondary care. It aims to support the safe, effective and efficient use of medicines by the provision of evidence-based information and advice on their therapeutic use. It supports the management of medicines within NHS organizations and the pharmaceutical care of individual patients. The service is provided by a

network of two national centres, 14 regional centres and 250 local centres (based in the pharmacy departments of most hospitals). These centres work closely to provide a virtual national service. The centres are staffed by pharmacists and technicians with clinical expertise, and special training in locating, assessing and interpreting information about medicines.

At the local level the services are used by health-care professionals, patients and managers. Services provided include answering queries on all aspects of the therapeutic use of drugs, pro-active information (bulletins/newsletters), setting service standards, preparing standard operating procedures and risk management policies, support for Drug and Therapeutic Committees, and education and training. Specialist and toxicology services are also provided. Advice is provided on all aspects of the therapeutic use of medicines and a wide range of biomedical and pharmaceutical sources of information are available for reference.

The Royal Pharmaceutical Society of Great Britain (RPSGB) Technical Information Service is staffed by five pharmacists and provides a service to its members including replies to queries, literature search and training.

3.3 Drug information services: India

Dr P.K. Lakshmi spoke about the DICs presently providing services throughout India. She said that dissemination of unbiased drug information is the need of the hour, especially in a country such as India with a population of over a billion. The challenges in promoting rational drug therapy will only escalate further with the availability of more than 80 000 formulations, a considerable number being irrational, fixed-dose combinations that are used widely.

The pioneers in providing drug information in India were the Karnataka State Pharmacy Council (KSPC), JSS College of Pharmacy, Mysore, and the Ooty and Thiruvananthapuram medical colleges. Following this trend, many DICs were initiated in India. There are some specialized centres that provide information exclusively on poisoning, e.g. Poison Information Centre, All India Institute of Medical Sciences (AIIMS), New Delhi. Most of the DICs are attached to teaching hospitals in collaboration with pharmacy schools running clinical pharmacy programmes.

In view of the concentration of DICs in south India, a project was conceptualized and executed by KSPC in collaboration with the WHO Country Office in India. The project included the establishment of five independent DICs in northern India which are working efficiently.

Dr Lakshmi highlighted the functions of a good DIC, such as providing drug information, documenting the queries asked, retrieving information, conducting quality assurance analysis and upgrading of skills on a continuous basis. Good communication facilities and distribution of promotional materials are a part of the services provided. DICs can also train health-care professionals in promoting the rational use of drugs. DICs should liaise with international organizations such as WHO, national organizations and NGOs. Networking with other established DICs would be of help in answering complex queries.

3.4 Drug information services: Nepal

Mr P. Subish presented a report on the DICs available in Nepal. Like most other developing countries, Nepal also suffers from lack of adequate drug information due to limited availability of current literature as well as poor documentation and dissemination of the available information. Generally, unbiased and current drug references are not available in most clinical facilities, and to officials, clinicians and committees developing drug lists and making procurement decisions.

In 1992, United States Pharmacopeia (USP), began working in developing countries through the Rational Pharmaceutical Management (RPM) project to improve access to essential drugs, increase rational drug use and local capacity to develop, package and disseminate unbiased and locally specific drug information. Four organizations in Kathmandu were initially identified as potential sites for DICs and the first DIC was started at the Tribhuvan University Teaching Hospital, Kathmandu in 1994.

To encourage liaison between various organizations, the Drug Information Network of Nepal (DINoN) was established on November 1996 with multisectoral participation from the government, academic and nongovernmental institutions. Presently, the DINoN has nine members though, of late, its activities are at a low key.

The first DIC in the private sector was established in Manipal Teaching Hospital, a tertiary care hospital in western Nepal in November 2003 in collaboration with the United States Pharmacopeia Drug Quality Information/United States Agency for International Development (USPDQI/USAID). This DIC has gained widespread acceptance as a source of medicines and therapeutic information. The DIC has also been active in a number of other areas including publication of a drug information bulletin, medication counselling services to patients, contributions to the Drugs and Therapeutics Committee, pharmacovigilance, a continuing pharmacy education programme as well as research in the rational use of medicines.

4. Introduction to Resources and Hands-on Experience

4.1 Primary literature retrieval and interpretation

The participants were trained to analyse and interpret available information and critically evaluate it. How the literature is indexed was explained in addition to the protocols and procedures for retrieving information and answering queries. Simultaneously, exercises were conducted, which provided a platform for the participants to gain hands-on experience.

During the sessions on retrieving drug information, participants were provided with access to a number of information resources including *Martindale* (35th edition), *Micromedex healthcare series*, *Therapeutic guidelines (eTG)*, *BNF 52* and *MedicinesComplete*.

The development of standard operating procedures as a means of ensuring that the correct background information is collected and the most appropriate resources are used in the right order was discussed.

4.2 Hands-on experience

Participants were invited to submit medicine information queries. They were then guided in the development of appropriate search strategies for the queries they had submitted and encouraged to use the above information sources to compare and contrast the layout and information

available in order to answer their queries. The importance of applying the information available in each source to their own context (clinical scenarios, availability of drugs, etc.) and of cross-referencing information was stressed.

The following examples highlight the use made of each of the information resources:

Use of nifedipine during pregnancy

After discussing the need for additional background information, the information available in the above reference sources was investigated. *BNF* 52 appendix 4 provided limited information regarding the use of nifedipine during pregnancy and highlighted the need to consult further reference sources. *Martindale* 35 reported the use of nifedipine in pregnancy and also provided a link to the management of hypertension in pregnancy. *eTG* provided information regarding the Australian categorization of nifedipine for use in pregnancy. *Micromedex* was searched using the specific databases related to reproduction, drug evaluation for nifedipine and *Drug consult* regarding the management of hypertension in pregnancy.

Psychiatric patient on multiple medications: whether drug interactions could affect the efficacy of treatment

The information available in the above reference sources was investigated. *MedicinesComplete* *BNF* 53 and *Stockley's drug interactions* were accessed as first-line reference sources. *Martindale* 35 and *Micromedex* were also searched for information. In addition, the website www.drugdigest.org was accessed, which allows users to build up a profile of potential drug interactions.

(An example of a detailed drug information query on cetirizine use in the treatment of the common cold is given in Annex 4.)

5. Introduction to HINARI – Synergy in information

Ms Anchalee Chamchuklin, Librarian, WHO/SEARO, provided detailed information on the Health InterNetwork Access to Research Initiative (HINARI) followed by an online hands-on session on how to access information through HINARI.

Participants were also trained to access PubMed through HINARI and given practice in search interfaces, display options, downloading search results, creating e-mail alerts and saving citations for future use. Ms Chamchuklin explained the various aspects of HINARI and how its full potential can be harnessed. She emphasized that the HINARI programme, set up by WHO together with major publishers, enables developing countries to gain access to collections of biomedical and health literature. Trouble-shooting contacts on HINARI were also distributed.

The Health Literature, Library and Information Services (HeLLIS) network and services were also introduced to the participants as an additional information resource beyond HINARI. Ms Chamchuklin demonstrated the HeLLIS portal to participants, which covers national information from the South-East Asia Region.

6. Country presentations

The participants were asked to present plans and proposals that could be employed in establishing a DIC. The participants were divided into two broad categories depending upon the nature of presentation asked for. The countries (Bhutan and the Maldives) that did not have any formal drug information services were asked to present the agenda (plans and proposals) to establish their DICs and participants from Nepal, Sri Lanka and India, who were already involved in disseminating drug information were asked to present plans for improving their DICs. At the end of the session, a CD of resources such as *Martindale: a complete drug reference* (35th edition) was distributed to the participants by WHO/SEARO.

6.1 Bhutan

In Bhutan there was no formal DIC; however, the pharmacist-in-charge of the National Hospital provided drug information informally but no documentation was done. The available infrastructure was one computer, some DI resources such as the *British National Formulary* (BNF), *Australian Medicines Handbook* (AMH) and *Current Index of Medical Specialties* (CIMS), and a common telephone line.

A three-phase proposal was put forward. In the first phase a database would be created to document information queries, and pharmacy

technicians trained to make them aware of drug information services, and on answering and recording DI queries at the national Referral Hospital. The necessary forms to undertake this activity would also be developed. Casualty services would be equipped in parallel with resources such as computers, printers, telephone lines and other equipment. At the hospital level, the director, heads of departments and other categories of prescribers would be sensitized about drug information services. Sensitization at the national level would be carried out through the media for district health workers/prescribers and the public. The training would then be expanded to all pharmacy technicians through workshops.

After successful implementation of phase I, in phase 2 the Centre would extend its DI services to a minimum of two regional hospitals and decentralize DI services to all the districts. The administration would need to be convinced to recruit a pharmacist for each of the regional referral hospitals. Phase III would have a mature DIC in the national Referral Hospital that could involve itself with the administrators to advocate for funds and ensure sustainability.

6.2 India

Central Government Health Scheme (CGHS)

The information provided by the Centre pertains mainly to product information. The resources available are computers, internet, telefax and a room which can be used for the prospective DIC.

There are many constraints in starting a DIC such as a lack of trained and dedicated personnel to ensure its efficient functioning.

Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER)

JIPMER is a medical college with a 1200-bedded teaching hospital attached to it. Presently, there are no regular DI services but informally queries are answered by the Department of Pharmacology. The available infrastructure includes a computer, high-speed internet connection, telephone, a pharmacy postgraduate and a comprehensive library. A bulletin called *Drug Alert* was being published jointly with the department of pharmacovigilance, but publication has stopped due to paucity of funds.

The proposals made were the establishment of a DIC at JIPMER Hospital initially, followed by services to other hospitals in Pondicherry. This

will require additional recruitment of staff, a direct telephone line and fax facility, and Rs 30,000 per year for recurring expenses.

6.3 Maldives

The capital city Male, has a 250-bed hospital with no pharmacists, limited human resources, and two commercial pharmacies as distribution outlets. There are no DI services; drugs are exclusively imported from neighbouring countries. The availability of drug information resources such as the *BNF* and *CIMS* is limited. Drug information is based on self-search or the experience of seniors rather than evidence based.

Proposals included access to resource sites through the hospital library such as *Micromedex* and *MedicinesComplete*, and promotional activities for health-care professionals and consumers. Training would be needed for the librarian to perform a product search, update the website, etc. The availability of telemedicine would help in providing drug information. Workshops/training needed to be conducted for pharmacists. The limitations include lack of local human resources along with the lack of awareness for the need of DI services. A trouble-free internet service would also be required for the DIC to function. Lastly, funding would have to be considered to ensure sustainability.

6.4 Nepal

The DIC was established in the Department of Drug Administration (DDA). The Drug Information Network of Nepal (DINoN) was established in 1996 and is a network of governmental, academic and nongovernmental organizations (NGOs). Individual drug information centres are functioning efficiently but as a network, their functioning is not optimal. However, a voluntary and informal collaboration exists among individual centres. Besides regular drug information activities, the DDA assists in pharmacovigilance programmes, computerization of drug registration and in organizing seminars and workshops for training. Formulary development and maintenance, and assisting the hospital pharmacy, as well as continuing medical education for medical staff and development of the Nepal Drug Database are other tasks.

Drug information services include the provision of drug information, publishing public notices on the issue of a drug and its safety, publishing the National List of Essential Drugs and the Nepal National Formulary, and updating them from time to time.

For existing centres, the resources requested from WHO were *BNF*, *Martindale*, *eTG*, *Micromedex* and training of staff. For new centres, requests included procurement of DI resources such as *BNF*, *Martindale* (hard copies preferably), training of staff and infrastructural facilities. Additional requests included networking of the centres through a common discussion forum meant for information sharing within the DICs and uploading drug bulletins on the HeLLIS website.

6.5 Sri Lanka

Drug information services have been in existence since the past 15 years at the Ministry of Health and Department of Pharmacology, Faculty of Medicine at the University of Colombo. Presently, services include answering queries, conducting continuing education programmes for health-care professionals and consumers, and publishing drug-related information and journals, guidelines and bulletins. The DIC is also involved in research and developing National Prescribing Guidelines, and participating in the Drug and Therapeutic Committee (DTC) for inclusion of drugs in the formulary. The centre has three temporary rotating junior staff and six senior academic staff from the Department of Pharmacology who are consulted when required. There is also a voluntary expatriate pharmacy consultant from the Medical Information Service, UK. Queries are usually received and answered by telephone; most of these are of an informal nature from doctors, medical students and other health-care staff.

The available resources are books (*BNF*, *Martindale*, *USPDI*, *Goodman and Gilman's textbook of pharmacology*, *eTG*, *Brigg's textbook of drug use in pregnancy and lactation*), and the use of Medline to search for abstracts to respond to queries. Documentation is done according to the date of query. Public education is provided through newspaper articles, radio and television programmes, and lectures at schools and temples.

The limitations include inadequate coordination and communication; and lack of proper documentation, trained pharmacists in the ministry of health, lack of drug information databases and the latest editions of

textbooks. In addition, only a small number of queries are received from hospitals at the periphery, there is poor use of existing facilities such as e-mails, fax, etc. and an online facility is not available. The support of the ministry and WHO needs to be garnered to improve the existing DI services.

Proposals included the appointment of dedicated, trained staff, and upgrading the facilities of the existing DIC. Participation by the pharmacist during ward rounds to collect queries and promoting DIC activities at clinical meetings were also suggested.

7. Professional responsibilities, rational use of medicines

The professional requirements of a drug information practitioner include excellent communication skills and a good clinical approach. The DI pharmacist should respond quickly to simple queries and devote time in searching for answers to complex queries. The resources for efficient functioning and providing drug information include textbooks, journals, databases, computers as well as funding for recurring and non-recurring expenses. DICs can be located either in a hospital, university or other independent organizations.

Recording of enquiries is an essential aspect of any DIC. The documentation should include the details of the enquiry, enquirer and type of enquiry. In Australia, DICs use a database called Australian National Drug Information Network (ANDIN), and in UK the medicines information system is called MiDatabank.

The ethical requirement for DICs/pharmacists is to respect the confidentiality of clients. They have legal indemnity for errors and must be responsible for the well-being of individual patients and the public. DICs should maintain current references, and the personnel should undergo regular training to understand and outline the limits of the information sources used. DICs should also promote the rational use of medicines by providing evidence-based information in response to queries.

8. Closing Session – Discussion on future activities in Drug Information

Participants discussed the problems they were likely to face in initiating drug information services. It was not felt appropriate to make specific recommendations as experience of the participants with Drug Information Services was limited. However, the issues discussed could serve as a guide to future activities. The following challenges as well as ways to overcome them were discussed.

8.1 Country issues

- The participants felt that the biggest barrier to initiating drug information services is the lack of awareness of its necessity. In such cases, examples can be given of drug information contributing to better health outcomes. For example, in a child with renal failure and an infection, the dose of the antibiotic used is modified based on information provided by a DIC. If a drug is not used in a pregnant woman because it was teratogenic as specified by the DIC, harm is avoided. However, quantifying the results of information provided systematically and presenting these as a cost benefit was difficult.
- There was also resistance from prescribers who felt they had sufficient information and did not make mistakes, despite overwhelming evidence to the contrary of common errors in medication and poor choice of drugs based on incomplete and biased information.
- Even when drug information was felt to be important, administrators and decision-makers felt that it could be a part of the routine activities of pharmacy departments. A particularly prominent fact was the absence of trained human resources; a dedicated pharmacist for drug information was often not considered necessary.
- In view of all this, advocacy was considered an important part of initiating drug information activities. Drug information that is informally provided should be documented as evidence of the quantity and importance of the work involved. Promotion was

necessary; notices about the DIC, and distribution of questions and answers by the DIC would help in this.

- Funds for drug information activities should come from the drug budget itself. About 1% would be sufficient for a comprehensive service. A particular problem was that when a budget head was for medicines, then it was not possible to use it for medicines information. Hospital administrators should be made aware that good drug information would provide better health outcomes through better drug use and, inevitably, a decrease in the drug budget as most problems are due to excessive and irrational use. A defined proportion of the drug budget for drug information activities would solve the problem of sustainability.
- Logical partners in drug information services were departments of pharmacology in medical and pharmacy schools. They could provide resources as well as student/intern training opportunities. An added benefit would be inculcating drug information concepts during the student years. Other possibilities for collaboration were “twinning” with medicines-related units such as pharmacovigilance units.
- Most participants felt that drug information as a concept was not covered in the training of health-care professionals. While appreciating that many scientific areas jostle for inclusion in the curriculum of health-care professionals, it was thought that a small module on the principles of drug information should be included in the curriculum.
- The biased information that is provided with drug promotion and advertisements was discussed. Drug information services should counter such information. Regulation through legislation was considered the major mechanism to do this effectively.

8.2 Regional issues

- The advantages and disadvantages of resources (*Martindale*, *BNF*, *eTG*) provided during the workshop were discussed. *Micromedex* had a time-limited access. Would it be possible to provide a basic drug information service with these resources? The other resource suggested was the hard copy of a used *American Hospital Formulary System (AHFS)*, which could be procured through the International Pharmaceutical Federation (FIP)

“Pharmabridge” scheme. A trial of complementary time-limited subscriptions for web sites was also possible. These resources should be sufficient for initiating a modest drug information service.

- Most of the participants had broadband internet access and therefore internet-based drug information was possible. The CDs provided at the workshop would give good off-line access but, when necessary, online access was possible.
- The possibility of a regional license for commercial drug information databases (*MedicinesComplete*, *Micromedex*) was discussed but was thought premature, particularly because of the cost. The participants could use the free access available at present to assess how useful these web sites were. The issue would be raised again in about three months.
- Once drug information services were established, it was important to register them in the International Register of Drug Information Services (IRDIS) http://www.shpa.org.au/docs/druginfo_int.html. This would ensure visibility.
- The possibility of requesting advanced drug information from well-functioning and established centres in the Region in case the drug information service could not answer certain queries was also discussed. Those in advanced centres were willing to help but noted that such queries must not be basic ones as otherwise they would be overloaded. In some situations (e.g. the Maldives) where human resources were limited, a more continuous link may be needed. A formal link with a centre could be considered a part of regional cooperation. Initial funding for such a link could be from regional funds as a pilot project but countries would have to fund themselves subsequently on a long-term basis.
- The possibility of a common regional discussion forum (internet-based) was mooted so that newly established centres could discuss queries among themselves and understand the methodology of answering them. This site could also host the drug information bulletins (DIBs) of the Region. These could be cross-linked with HINARI to prevent duplication. DIBs could also be shared, where possible electronically, as that would decrease costs.

- Other existing resources were introduced by participants and those not accessing them were encouraged to use them. One example was the internet e-drug discussion group <http://list.healthnet.org/mailman/listinfo/e-drug>. A list of drug information web sites is given in Annex 5.
- Once a drug information service is established, training may be required as the demand increases and queries become more complicated. At that stage, opportunities for training should be investigated. There are regional centres that could provide such training; funding for such training would have to be sourced from ministries of health and the WHO Country budget for medicines.

Annex 1

Message by Dr Samlee Plianbangchang Regional Director, WHO South-East Asia Region

"Medicines are one of the most cost-effective interventions in improving health. Essential medicines are the most refined in this category since they are chosen on the grounds of efficacy, safety and cost-effectiveness, thereby representing the best value for money for both the patients and the community as a whole. The concept of Essential Drugs was enunciated in 1975 and given practical shape as the List of Essential Drugs in 1977. The revision of the list every two years has meant that it remains up-to-date and relevant. The last revision was in March 2007 and this 15th list is now available on the WHO website.

In addition, an Essential Medicines List for Children is expected to be finalized in the second half of this year.

However, we need to keep in mind that, essential medicines, by themselves, are a part of the solution; medicines, after all, are not simply chemicals/substances, but chemicals plus the information to use them safely, rationally and appropriately.

Information has a much more important function in medicines than with most other goods. Without appropriate information, medicines, at best, could produce an acceptable outcome and, at worst, an outcome that could be disastrous either in terms of morbidity or mortality. Thus, providing appropriate information for the Rational Use of Medicines is a key component to achieving their full potential.

Although providing the appropriate information might seem simple, further examination reveals the very complex nature of the varied stakeholders and sometimes contradictory objectives, in providing information.

Medicines are a commodity subject to market forces and prescribed by health care practitioners and bought by patients and consumers. They are a very profitable commodity producing a high rate of return. It is therefore understandable why those involved in their production and sale

would like to influence the decision as to what medicines are prescribed and sold.

Thus, information becomes a crucial component in this selling process. This information that may, at the best, provide good evidence for use and, at the worst, promote an ineffective or a lesser effective medicine.

However, when information on medicines is looked at from the perspective of health, there should be only one objective – that is, information to prescribe the correct medicine using the generic name, in the correct dose, for the correct duration with affordability in mind, and with the appropriate information being provided to the patient or consumer.

To achieve this, drug information should be evidence-based, scientifically-driven and unbiased. The scientific literature which should be the basis for this evidence should be specified as a part of transparency. If clear recommendations cannot be made, the evidence must be presented for the prescriber to make the correct and appropriate decision.

Previously, in settings with limited resources, a factor common in countries of the South-East Asia Region, it was difficult to access good quality drug information. Even when it did become available there was the issue of updating it. With the coming of the “Information Age” there has been an explosion of drug information and an implosion of some of the barriers to information.

Efforts such as Health Internetwork Access to Research Initiative (HINARI) have made some health information easily available to the least developed countries. However, these are the countries that have the most problems with the technology required to access the information. Authoritative drug information databases to support clinical practice are available but share with medicines, the same problem of affordability, as the subscriptions are costly.

From the perspective of the ministries of health, it is important to realize that providing good drug information is potentially one of the most cost-effective interventions for their medicines budget. Often, ministries spend considerable amounts to supply medicines but nothing to provide the information to use the medicines rationally and appropriately. Spending even 1% of the drug budget on drug information should provide savings far

in excess of this. In this context, the decision of a Member country in the Region to allocate 0.2% of the drug budget for information activities is a good beginning.

Provision of evidence-based, scientifically-driven and unbiased drug information should be a major activity in medicines for the ministry of health. It would be important to emphasize and advocate for the use of this drug information by health care professionals in preference to other sources such as pharmaceutical company information/promotion, and clinical opinions of uncertain veracity. The use of the drug information services will, of course, depend on their credibility and relevance.

Drug information activities are in various stages of development in countries of the Region. However, all countries have the potential of establishing an independent drug information service useful to their particular situations. This could be in the health ministry itself, or in collaboration with partners such as a department of pharmacology in a faculty of medicine or institutions such as pharmacy councils. Even with limited resources there is sufficient evidence-based, scientifically-driven, unbiased information that a Drug Information Service could use to provide useful and relevant information to their health care professionals.

However, it is not simply a question of "harvesting" information from the sources. Equally important is the presentation of the information in a manner that is understandable and useful to the prescriber and other health professionals. I am happy to note that acquiring the skills for this harvesting and imparting it is an important part of this workshop. Drug information from databases, formularies, drug information bulletins and pharmacopeias will be available to the participants. Providing relevant information from these sources in response to a question from a prescriber is the specific end-product that participants should aim for. Drug information that is evidence-based, scientifically-driven and unbiased leading to better health is the ultimate objective.

Additionally, this workshop will present an opportunity for sharing country experiences on the existing drug information services. Finally, it will also provide an opportunity for participants to share regional experiences in drug information such as regional licenses.

Annex 2

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23383142
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FAX: +61+3+9459 4546
E-mail: Graeme.Vernon@austin.org.au

Annex 3

Programme

Tuesday, 8 May 2007

08:30 – 12:30

Welcome/Opening remarks
RD

Objectives of the meeting

Session 1: Drug Information – Global, Regional & Country (Part1)

- Drug Information Centres / Services – Global scenario
- Drug Information Centres / Service – Country experiences (UK, India, Nepal)
- Discussion – what are the lessons from these for the South-East Asia region.

13:30 – 17:00

Session 2: Drug Information – Introduction to Resources and Hands-on experience

- Drug Information Resources – what is available and how can they be accessed
- Reliability of Drug Information
- Hands-on accessing drug information.
- Discussion – what can be done in the countries given these resources?

Wednesday, 9 May 2007

08:30 – 12:30

Session 3: Drug Information - Primary literature retrieval and interpretation

- PubMed, retrieving information and critical analysis.
- Protocols and Procedures in responding to Drug Information queries
- Hands-on experience
- Discussion

13:30 – 17:00

Session 4: HINARI – Synergy in Information

- Health InterNetwork Access to Research Initiative (HINARI) – Introduction, it's capabilities and using it to the full potential
- Other Health Information Databases available to countries
- Discussion
- Hands-on experience (online) in using HINARI.
- Briefing on Country Presentations

Thursday, 10 May 2007

08:30 – 12:30

Session 5: What is possible in the countries (Country participants)

- Presentations (BHU, MAV) – A beginning
- Presentations (NEP, SRL, IND) – Stepping-up
- Discussion
- Hands-on experience, drug information (time permitting)

13:30 – 17:00

Session 6: Professional Responsibilities, Rational Use of Medicines

- Drug Information, Ethical, Legal and Professional responsibilities-of Drug Information Practice
- Role of DICs in Promoting Rational Use of Medicines
- Drug Information Bulletins – their role and association with DICs.
- Discussion

Friday, 11 May 2007

08:30 – 12:30

Session 7: Access to Drug Information Databases on Consortium (Regional) Basis

- Regional Cooperation for License for Drug Information Databases – What are country requirements?
- Discussion
- Recommendations

13:30 – 17:00

Session 8: Regional Collaboration in Drug Information Activities

- Drug Information Centers – Possibilities of Regional Collaboration
- Recommendations & Conclusions

Annex 4

Example of a drug information query on cetirizine use in the treatment of the common cold

Question: Why is Cetirizine used in the treatment of the common cold

Search Strategy:

BNF 52:

Search term: Cetirizine

Cetirizine monograph

Non sedating antihistamine

Indications: Symptomatic relief of allergy such as hay fever, urticaria

Search term: Cold

Nil relevant

eTG

Search term: Cold

Acute viral rhinitis: common cold

Antihistamines in combination with a decongestant may provide additional symptomatic relief.

Refers to link to article on National Prescribing Service Website- see below

Search term: Cetirizine

Cetirizine index page

Nil relevant

National Prescribing Service

<http://www.nps.org.au/site.php?page=2&content=/resources/ccncs/index.htm> (accessed 15.5.7)

What you need to know about common colds

No reference to antihistamines

Martindale 35

Search term: Cetirizine

Nil relevant

Search term: Cold

Analgesics, cough suppressants, antihistamines, and decongestants relieve symptoms but do not tend to reduce the duration of illness.

Micromedex

Search term: Cold

Drug Consult: The common cold- etiology and treatment

ANTIHISTAMINES: These agents may help relieve symptoms of rhinitis, lacrimation, and sneezing associated with the common cold. They have greatest activity if administered prior to the onset of histamine-induced inflammatory responses. The anticholinergic and sedative effects of antihistamines may reduce mucus secretion and help the cold sufferer rest. (Please note cetirizine is classified as a non sedating antihistamine RK)

The different classes of antihistamines differ in their sedative effects. More sedation is seen with the ethanolamines than with ethylenediamines and alkylamines may produce stimulation. Tolerance to the sedative effect does develop, so that patients who need chronic antihistamine therapy for allergic conditions are not greatly bothered unless their therapy is intermittent.

Available data indicate that antihistamines are only marginally superior to placebo in providing subjective improvement in several cold symptoms.

Search term: Cetirizine

Nil relevant

Prodigy / Clinical Knowledge Summaries

<http://www.cks.library.nhs.uk/> (accessed 15.5.7)

Search term: Cold

Under section: Common cold

Recommends the use of paracetamol and aspirin (adults), ibuprofen (children) and then goes on to say:

There is no evidence to support the use of the wide variety of other products marketed for the management of the common cold.

Also Refers to an NHS Direct patient information leaflet:

Antihistamines can help to ease the symptoms of a cold because one of the side effects of some antihistamines is that they can help dry up mucus. Examples of antihistamines used in cold remedies are chlorpheniramine, brompheniramine and triprolidine. Doctors don't usually recommend taking an antihistamine alone to help ease cold symptoms. However, antihistamines are often used in cold medicines along with a painkiller or an oral decongestant.

Antihistamines may cause drowsiness, dry mouth, constipation, difficulty passing urine, or blurred vision. They may also interact with other drugs that cause drowsiness, such as alcohol and some antidepressants and could lead to problems for people with glaucoma or prostate problems. You should check with a pharmacist or your GP before taking cold remedies containing antihistamines.

Under section: Common cold summary

There are also many other products marketed for sale over the counter to treat the common cold, comprising various combinations of decongestants, demulcents, expectorants, antitussives, and antihistamines. There is no good evidence for or against their use. Many contain illogical combinations and produce a spectrum of adverse effects.

Pubmed search (accessed 11.5.7)

Search term: Common Cold (MESH) Limits: English, Human

1840 hits including:

Simasek M, Blandino BA

Treatment of the common cold.

Am Fam Physician. 2007 Feb 15;75(4):515-20. Review.

Extract from abstract:

Antihistamines and combination antihistamine/decongestant therapies can modestly improve symptoms in adults; however, the benefits must be weighed against potential side effects. Newer nonsedating antihistamines are ineffective against cough.

Full text article available from Am Fam Physician website at

<http://www.aafp.org/afp/20070215/515.html>

Key recommendations for practice:

Older first-generation antihistamines and combination antihistamine/decongestants are treatment options for cough and cold symptoms in adults if the benefits outweigh the adverse effects

Cough

One study included in the Cochrane review showed that combination antihistamine/decongestant medications have a modest benefit but with significantly increased adverse effects. In contrast, newer-generation, nonsedating antihistamines do not effectively reduce cough. Because of the conflicting evidence, physicians must weigh the risks and benefits of dextromethorphan or combination antihistamine/decongestant medications

Nasal Congestion and rhinorrhea

Although some randomized controlled trials (RCTs) of older first-generation antihistamines have shown positive results for certain end points, a Cochrane review concluded that antihistamines do not alleviate cold-related sneezing or nasal symptoms to a clinically significant degree and do not affect subjective improvement in children or adults.⁶ Even if a slight clinical benefit exists, there are risks and adverse effects, especially with first-generation antihistamines. Therefore, antihistamine monotherapy is not recommended for children and should be used cautiously in adults.

Although a first-generation oral antihistamine and decongestant combination may have some effect on nasal obstruction, rhinorrhea, and sneezing in adolescents and adults, studies generally are of poor quality, and effects are small and may not be clinically significant. Antihistamine/decongestant treatment has not been shown to benefit young children.

Refers to related link:

Sutter AI, Lemiengre M, Campbell H, Mackinnon HF

Antihistamines for the common cold

Cochrane Database Systematic review 2003;(3): CD001267

Information from abstract (not able to access full text)

There was no evidence of any clinically significant effect - in children or in adults - on general recovery of antihistamines in monotherapy. First generation - but not non-sedating - antihistamines have a small effect on rhinorrhea and sneezing. In trials with first generation antihistamines the incidence of side effects (especially sedation) is significantly higher with active treatment. Two trials, studying a combination of antihistamines with decongestives in small children, both failed to show any effect. Of the eleven trials on older children and adults, the majority show an effect on general recovery and on nasal symptom severity.

REVIEWER'S CONCLUSIONS: Antihistamines in monotherapy - in children as well as in adults - do not alleviate to a clinical extent nasal congestion, rhinorrhoea and sneezing, or subjective improvement of the common cold. First generation antihistamines also cause more side-effects than placebo, in particular they increase sedation in cold sufferers. Combinations of antihistamines with decongestives are not effective in small children. In older children and adults most trials show a beneficial effect on general recovery as well as on nasal symptoms. It is however not clear whether these effects are clinically significant.

Summary:

Nil specific to use of cetirizine

Antihistamines in monotherapy or in combination with decongestants may provide symptomatic relief in the treatment of the common cold. There is limited clinical evidence to support their routine use and the benefits of their use would have to be weighed against their adverse effects

Annex 5

Drug Information Web Sites

General

[ADEC](http://www.tga.gov.au/docs/html/adecc/adeccrecs.htm) <http://www.tga.gov.au/docs/html/adecc/adeccrecs.htm>
[BioSpace](http://www.biospace.com/) <http://www.biospace.com/>
[Clinicians Health Channel](http://www.health.vic.gov.au/clinicians) <http://www.health.vic.gov.au/clinicians>
[DermIS \(Dermatology info.\)](http://www.dermis.net/) <http://www.dermis.net/>
[FDA - Center for Drug Evaluation and Research](http://www.fda.gov/cder/) <http://www.fda.gov/cder/>
[IP \(Intellectual Property\) Australia](http://www.ipaustralia.gov.au/index.html) <http://www.ipaustralia.gov.au/index.html>
[LactMed](http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT) <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT>
[Lactation \(UK MI\)](http://www.ukmicentral.nhs.uk/drugpreg/guide.htm) <http://www.ukmicentral.nhs.uk/drugpreg/guide.htm>
[MED-E-SERV](http://www.medeserv.com.au/) <http://www.medeserv.com.au/>
[Medical dictionary](http://cancerweb.ncl.ac.uk/omd/) <http://cancerweb.ncl.ac.uk/omd/>
[MedicinesComplete](http://www.medicinescomplete.com/mc/) <http://www.medicinescomplete.com/mc/>
[Medscape](http://www.medscape.com/) <http://www.medscape.com/>
[National Prescribing Curriculum](http://nps.unisa.edu.au/new/index.htm) <http://nps.unisa.edu.au/new/index.htm>
[National Prescribing Service](http://www.nps.org.au/) <http://www.nps.org.au/>
[PBS general](http://www.health.gov.au/pbs) <http://www.health.gov.au/pbs>
[PBS schedule](http://www.pbs.gov.au/) <http://www.pbs.gov.au/>
[Pathology Manual - RCPA](http://www.rcpamanual.edu.au/) <http://www.rcpamanual.edu.au/>
[PharmWeb](http://www.pharmweb.net/) <http://www.pharmweb.net/>
[Pregnancy - Australian categories](http://www.tga.gov.au/docs/html/medpreg.htm) <http://www.tga.gov.au/docs/html/medpreg.htm>
[SHPA](http://www.shpa.org.au/docs/about.html) <http://www.shpa.org.au/docs/about.html>
[Statistics - 'A New View of Statistics'](http://www.sportsci.org/resource/stats/index.html) <http://www.sportsci.org/resource/stats/index.html>
[Therapeutic Goods Administration \(TGA\)](http://www.tga.gov.au/) <http://www.tga.gov.au/>
[UK Medicines Information](http://www.ukmi.nhs.uk/) <http://www.ukmi.nhs.uk/>
[US FDA - CDER](http://www.fda.gov/cder/) <http://www.fda.gov/cder/>

Clinical Guidelines

[AIDSinfo - HIV-AIDS \(US\)](http://www.aidsinfo.nih.gov/) <http://www.aidsinfo.nih.gov/>
[Australasian Society of Clinical Immunology and Allergy \(ASCIA\)](http://www.allergy.org.au/) <http://www.allergy.org.au/>
[Australian Skeptics](http://www.skeptics.com.au/) <http://www.skeptics.com.au/>
[Bandolier Evidence Based Health Care](http://www.jr2.ox.ac.uk/Bandolier/index.html) <http://www.jr2.ox.ac.uk/Bandolier/index.html>
[Best Practice Advocay Centre \(NZ\)](http://www.bpac.org.nz/default.asp?action=article&ID=3)
<http://www.bpac.org.nz/default.asp?action=article&ID=3>
[BestBETs](http://www.bestbets.org/) <http://www.bestbets.org/>
[Blood Services](http://www.transfuse.com.au/) <http://www.transfuse.com.au/>
[CADTH \(Canada\)](http://www.ccohta.ca/) <http://www.ccohta.ca/>
[CRISP \(NIH\)](http://crisp.cit.nih.gov/) <http://crisp.cit.nih.gov/>
[Centre for Clinical Effectiveness - Monash](http://www.monash.edu.au/clinical-effectiveness/)

<http://www.med.monash.edu.au/healthservices/cce/>
[Centre for Evidence-Based Medicine](http://www.cebm.net/) <http://www.cebm.net/>
[Cochrane Library](http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/HOME) <http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/HOME>
[Emergency Contraception \(pw = Postinor\)](http://www.emergencycontraception.com.au/) <http://www.emergencycontraception.com.au/>
[Evidence-Based On-Call \(UK\)](http://www.eboncall.co.uk/) <http://www.eboncall.co.uk/>
[G-I-N - Guidelines International Network](http://www.g-i-n.net/) <http://www.g-i-n.net/>
[GOLD - COPD](http://www.goldcopd.com/) <http://www.goldcopd.com/>
[Global Initiative for Asthma \(GINA\)](http://www.ginasthma.com/) <http://www.ginasthma.com/>
[Health Technology Assessment Programme \(UK\)](http://www.hta.nhsweb.nhs.uk/) <http://www.hta.nhsweb.nhs.uk/>
[HealthySkepticism \(prev. MaLAM\)](http://www.healthyskepticism.org/) <http://www.healthyskepticism.org/>
[ISABEL \(UK paediatrics\)](http://www.isabel.org.uk/) <http://www.isabel.org.uk/>
[Intute \(UK\)](http://www.intute.ac.uk/) <http://www.intute.ac.uk/>
[NHMRC](http://www.health.gov.au/nhmrc/) <http://www.health.gov.au/nhmrc/>
[NHS Centre for Reviews and Dissemination](http://www.york.ac.uk/inst/crd/welcome.htm) <http://www.york.ac.uk/inst/crd/welcome.htm>
[National Asthma Council](http://www.nationalasthma.org.au/index.htm) <http://www.nationalasthma.org.au/index.htm>
[National Center for Complimentary and Alternative Medicine](http://nccam.nih.gov/) <http://nccam.nih.gov/>
[National Guideline Clearinghouse \(US\)](http://www.guidelines.gov/) <http://www.guidelines.gov/>
[National Heart Foundation](http://www.heartfoundation.com.au/) <http://www.heartfoundation.com.au/>
[National Institute for Health and Clinical Excellence \(NICE\)](http://www.nice.org.uk/nice-web/Cat.asp?pn=professional&cn=toplevel&ln=en) <http://www.nice.org.uk/nice-web/Cat.asp?pn=professional&cn=toplevel&ln=en>
[National Prescribing Centre \(UK\)](http://www.npc.co.uk/) <http://www.npc.co.uk/>
[National electronic Library for Health \(NeLH\)](http://www.nelh.nhs.uk/) <http://www.nelh.nhs.uk/>
[NeLH - Guidelines Finder](http://rms.nelh.nhs.uk/guidelinesfinder/) <http://rms.nelh.nhs.uk/guidelinesfinder/>
[Prodigy Guidance List \(UK\)](http://www.prodigy.nhs.uk/) <http://www.prodigy.nhs.uk/>
[QTdrugs.org - Drug-Induced Arrhythmia Registry](http://www.qtdrugs.org/) <http://www.qtdrugs.org/>
[Scottish Medicines Consortium](http://www.scottishmedicines.org.uk/) <http://www.scottishmedicines.org.uk/>
[TOXINZ - Poisons Information](http://www.toxinz.com/) <http://www.toxinz.com/>
[Therapeutics Initiative Home Page](http://www.ti.ubc.ca/index.html) <http://www.ti.ubc.ca/index.html>
[TripDatabase](http://www.tripdatabase.com/) <http://www.tripdatabase.com/>
[Wound Education and Research Group - VCP](http://www.vcp.monash.edu.au/werg/) <http://www.vcp.monash.edu.au/werg/>
[Wounds - SMTL \(Wales\)](http://www.smtl.co.uk/) <http://www.smtl.co.uk/>
[eMJA - Clinical Guidelines](http://www.mja.com.au/public/guides/guides.html) <http://www.mja.com.au/public/guides/guides.html>

Computer Sites

[Advanced Chemistry Development \(imaging software\)](http://www.acdlabs.com/) <http://www.acdlabs.com/>
[Download.com](http://www.download.com/) <http://www.download.com/>
[OpenOffice](http://www.openoffice.org/) <http://www.openoffice.org/>
[PC Pitstop Internet](http://www.pcpitstop.com/internet/Bandwidth.asp) <http://www.pcpitstop.com/internet/Bandwidth.asp>
[PC World](http://pcworld.idg.com.au/) <http://pcworld.idg.com.au/>
[PDF zone](http://www.pdfzone.com/) <http://www.pdfzone.com/>
[Search Engine Watch](http://www.searchenginewatch.com/) <http://www.searchenginewatch.com/>
[Tucows](http://tu cows.com) <http://tu cows.com>
[Web Design & Usability Guidelines](http://usability.gov/pdfs/guidelines.html) <http://usability.gov/pdfs/guidelines.html>
[ZDNet](http://www.zdnet.com.au/) <http://www.zdnet.com.au/>

Drug Compendia

[AHFS Drug Information](http://www.ashp.org/ahfs/) <http://www.ashp.org/ahfs/>
[Atmedica, Malaysian MIMS](http://www.atmedica.com.my/) <http://www.atmedica.com.my/>
[Australian Medicines Handbook](http://www.amh.net.au/) <http://www.amh.net.au/>
[British National Formulary](http://bnf.org/) <http://bnf.org/>
[DailyMed - US Pls](http://dailymed.nlm.nih.gov/dailymed/) <http://dailymed.nlm.nih.gov/dailymed/>
[Drugref.org](http://drugref.org/) <http://drugref.org/>
[Drugs.com \(US Pls\)](http://drugs.com/) <http://drugs.com/>
[EMA - Europe](http://www.emea.eu.int/home.htm) <http://www.emea.eu.int/home.htm>
[Emixt - oral liquid formulations](http://pharminfotech.co.nz/manual/Formulation/mixtures/index.htm)
<http://pharminfotech.co.nz/manual/Formulation/mixtures/index.htm>
[Eopcrates](http://www.epocrates.com/) <http://www.epocrates.com/>
[EudraPharm](http://eudrapharm.eu/eudrapharm/welcome.do) <http://eudrapharm.eu/eudrapharm/welcome.do>
[Foreign medicines - PSGB](http://www.pharmj.com/noticeboard/info/pip/foreignmedicines.html)
<http://www.pharmj.com/noticeboard/info/pip/foreignmedicines.html>
[German drugs Rote Liste](http://www.rote-liste.de/) <http://www.rote-liste.de/>
[Hollings Pharmacy, NZ](file:///F:/Data/Druginfo/Hollings%20Pharmacy,%20NZ.htm) <file:///F:/Data/Druginfo/Hollings%20Pharmacy,%20NZ.htm>
[Hormonal Contraceptive Database \(IPPF\)](http://contraceptive.ippf.org/) <http://contraceptive.ippf.org/>
[Japan Pharmaceutical Reference](http://www.e-search.ne.jp/~jpr/) <http://www.e-search.ne.jp/~jpr/>
[MIMS](http://www.mims.com.au/default.htm) <http://www.mims.com.au/default.htm>
[New Drugs or Indications](http://www.pslgroup.com/NEWDRUGS.HTM) <http://www.pslgroup.com/NEWDRUGS.HTM>
[New Zealand Medicines Authority](http://www.medsafe.govt.nz/) <http://www.medsafe.govt.nz/>
[Pesticides and Veterinary Medicines Authority](http://www.apvma.gov.au/pubcris/subpage_pubcris.shtml)
http://www.apvma.gov.au/pubcris/subpage_pubcris.shtml
[RxList](http://www.rxlist.com/script/main/hp.asp) <http://www.rxlist.com/script/main/hp.asp>
[Singapore CDA](http://www.hsa.gov.sg/html/cda/about_cda.html) http://www.hsa.gov.sg/html/cda/about_cda.html
[StatRef](http://www.statref.com) www.statref.com
[Therapeutic Guidelines](http://www.tg.com.au/) <http://www.tg.com.au/>
[UK drug data sheets](http://emc.medicines.org.uk/) <http://emc.medicines.org.uk/>
[WHO Essential Drugs](http://www.who.int/medicines/) <http://www.who.int/medicines/>
[sfda](http://www.sfda.gov.cn/eng/) <http://www.sfda.gov.cn/eng/>

Health Care Sites

[AIDAN - All India Drug Action Network](http://www.aidanindia.org/) <http://www.aidanindia.org/>
[Adverse Medicines Event Line](http://www.safetyandquality.org/index.cfm?page=ACTION) <http://www.safetyandquality.org/index.cfm?page=ACTION>
[Australian Clinical Trials Registry](http://www.actr.org.au/) <http://www.actr.org.au/>
[Australian Commission on Safety and Quality in Health Care](http://www.safetyandquality.gov.au/)
<http://www.safetyandquality.gov.au/>
[Australian Drug Foundation](http://www.adf.org.au/) <http://www.adf.org.au/>
[Australian Red Cross Blood Service](http://www.arcbs.redcross.org.au/) <http://www.arcbs.redcross.org.au/>
[Australian Sports Drug Agency](http://www.asda.org.au/) <http://www.asda.org.au/>
[Australian Venom Research Unit](http://www.avru.org/) <http://www.avru.org/>
[Centers for Disease Control and Prevention \(US\)](http://www.cdc.gov/) <http://www.cdc.gov/>
[Current Controlled Trials](http://www.controlled-trials.com/) <http://www.controlled-trials.com/>

[Disease Control Priority Project](http://www.dcp2.org/) <http://www.dcp2.org/>
[E-drug](http://www.essentialdrugs.org/) <http://www.essentialdrugs.org/>
[Food Standards Agency UK](http://www.foodstandards.gov.uk/) <http://www.foodstandards.gov.uk/>
[Food Standards Australia New Zealand](http://www.foodstandards.gov.au/) <http://www.foodstandards.gov.au/>
[HyperTox \(Newcastle, NSW\)](http://www.ozemail.com.au:80/~ouad/toxi0001.htm) <http://www.ozemail.com.au:80/~ouad/toxi0001.htm>
[INRUD - International Network for Rational Use of Drugs](http://www.msh.org/inrud/index.html)
<http://www.msh.org/inrud/index.html>
[IPCS INTOX Programme](http://www.intox.org/) <http://www.intox.org/>
[International Network for the Availability of Scientific Publications](http://www.inasp.info) <http://www.inasp.info>
[Jean Hailes Foundation](http://www.jeanhailes.org.au/) <http://www.jeanhailes.org.au/>
[Medicines Control Agency \(UK\)](http://www.mca.gov.uk/) <http://www.mca.gov.uk/>
[Mental Health Research Institute](http://www.mhri.edu.au/home.htm) <http://www.mhri.edu.au/home.htm>
[NICS - National Institute of Clinical Studies](http://www.nicsl.com.au/) <http://www.nicsl.com.au/>
[Nantional Cancer Institute \(US\)](http://www.nci.nih.gov/) <http://www.nci.nih.gov/>
[National Health and Medical Research Council](http://www.nhmrc.gov.au/) <http://www.nhmrc.gov.au/>
[National Prescribing Centre \(UK\)](http://www.npc.co.uk/) <http://www.npc.co.uk/>
[OTIS - Organization of Teratology Information Specialists](http://otispregnancy.org/) <http://otispregnancy.org/>
[Palliative Care Matters \(PCM\)](http://www.pallcare.info/) <http://www.pallcare.info/>
[Palliattedrugs.com - online palliative care resource](http://www.palliattedrugs.com/) <http://www.palliattedrugs.com/>
[Quackwatch](http://www.quackwatch.com/) <http://www.quackwatch.com/>
[Therapeutic Guidelines](http://www.tg.com.au/) <http://www.tg.com.au/>
[Victorian Medicines Advisory Committee](http://www.health.vic.gov.au/vmac/) <http://www.health.vic.gov.au/vmac/>
[WHO - Uppsala Monitoring Centre \(for ADRs\)](http://www.who-umc.org/) <http://www.who-umc.org/>
[WHO drug stats ATCs](http://www.whocc.no/atcdddd/) <http://www.whocc.no/atcdddd/>
[WHO](http://www.who.org/) <http://www.who.org/>
[eMedicine World Medical Library](http://www.emedicine.com/) <http://www.emedicine.com/>

Consumers

[Better Health Channel](http://www.betterhealth.vic.gov.au/) <http://www.betterhealth.vic.gov.au/>
[HealthInsite](http://www.healthinsite.gov.au/) <http://www.healthinsite.gov.au/>
[Medicines UK](http://www.medicines.org.uk/) <http://www.medicines.org.uk/>
[POWH leaflets](http://www.sesahs.nsw.gov.au/powh/chac/ch/publications/cardiac/cardiac-pow.asp) <http://www.sesahs.nsw.gov.au/powh/chac/ch/publications/cardiac/cardiac-pow.asp>

State Clinical Web Sites

[CIAO \(WA\)](http://www.ciao.health.wa.gov.au/) <http://www.ciao.health.wa.gov.au/>
[CIAP \(NSW\)](http://www.ciap.health.nsw.gov.au/) <http://www.ciap.health.nsw.gov.au/>
[Clinicians Health Channel \(Vic.\)](http://www.clinicians.vic.gov.au/) <http://www.clinicians.vic.gov.au/>
[Clinicians Knowledge Network \(Qld\)](http://ckn.health.qld.gov.au/) <http://ckn.health.qld.gov.au/>
[SALUS \(SA\)](http://www.salus.sa.gov.au/) <http://www.salus.sa.gov.au/>

Immunisation

[Immunisation UK](http://www.immunisation.org.uk/) <http://www.immunisation.org.uk/>
[Immunise Australia](http://www.immunise.health.gov.au/) <http://www.immunise.health.gov.au/>
[NCIRS \(Sydney\)](http://www.ncirs.usyd.edu.au/) <http://www.ncirs.usyd.edu.au/>

[Vaccine Adverse Event Reporting System \(US\)](http://vaers.hhs.gov/) <http://vaers.hhs.gov/>

Interactions

[CYP interactions \(Flockhart\)](http://medicine.iupui.edu/flockhart/) <http://medicine.iupui.edu/flockhart/>

[HIV Drug Interactions](http://www.hiv-druginteractions.org/) <http://www.hiv-druginteractions.org/>

[HIV i-Base Interactions](http://www.i-base.org.uk/) <http://www.i-base.org.uk/>

Journals

[American Journal of Health-System Pharmacy](http://www.ashp.org/ajhp/index.cfm) <http://www.ashp.org/ajhp/index.cfm>

[Annals of Pharmacotherapy](http://www.theannals.com/) <http://www.theannals.com/>

[Australian Journal of Pharmacy](http://www.ajp.com.au/) <http://www.ajp.com.au/>

[Australian Prescriber](http://www.australianprescriber.com) <http://www.australianprescriber.com>

[BMJ Evidence Updates](http://bmjupdates.mcmaster.ca/index.asp) <http://bmjupdates.mcmaster.ca/index.asp>

[BioMed Central](http://www.biomedcentral.com/) <http://www.biomedcentral.com/>

[Canadian Journal of Hospital Pharmacy](http://www.cshp.ca/our_journal/our_journal.html) http://www.cshp.ca/our_journal/our_journal.html

[Drug and Therapeutic Bulletin](http://www.dtb.org.uk/idtb/) <http://www.dtb.org.uk/idtb/>

[European Journal of Hospital Pharmacy](http://www.eahponline.org/) <http://www.eahponline.org/>

[Health Internetwork](http://www.healthinternetnetwork.org/index.php) <http://www.healthinternetnetwork.org/index.php>

[Hospital Pharmacy](http://www.factsandcomparisons.com/Newsarticle.asp?ID=1) <http://www.factsandcomparisons.com/Newsarticle.asp?ID=1>

[JPPR Medline ISSN1445-937X](http://wwwcf.nlm.nih.gov/lstrc/lstrcform/med/index.cfm) <http://wwwcf.nlm.nih.gov/lstrc/lstrcform/med/index.cfm>

[Journal of Clinical Problem-based Learning](http://www.jclinpbl.org/high/index.htm) <http://www.jclinpbl.org/high/index.htm>

[Journal of Informed Pharmacotherapy](http://www.informedpharmacotherapy.com/) <http://www.informedpharmacotherapy.com/>

[Journal of Medical Internet Research](http://www.jmir.org/index.htm) <http://www.jmir.org/index.htm>

[Medical Journal of Australia](http://www.mja.com.au/) <http://www.mja.com.au/>

[Medical Letter](http://www.medletter.com/index.html) <http://www.medletter.com/index.html>

[Merec \(NPC - UK\)](http://www.npc.co.uk/merec.htm) <http://www.npc.co.uk/merec.htm>

[Pharm J/Hospital Pharmacist](http://www.pharmj.com/Index.html) <http://www.pharmj.com/Index.html>

[PLoS Medicine](http://www.plosmedicine.org/) <http://www.plosmedicine.org/>

[Pharmacotherapy](http://www.pharmacotherapy.org/) <http://www.pharmacotherapy.org/>

[PubMed Central Home](http://pubmedcentral.nih.gov/) <http://pubmedcentral.nih.gov/>

Libraries

[Anstat - Legislation](http://www.anstat.com.au/) <http://www.anstat.com.au/>

[Austin Health Library](http://library.austin.org.au/) <http://library.austin.org.au/>

[Austin Health journals](http://atoz.ebsco.com/home.asp?ld=auhealth) <http://atoz.ebsco.com/home.asp?ld=auhealth>

[BioMed Central](http://www.biomedcentral.com/) <http://www.biomedcentral.com/>

[Consort Statement](http://www.consort-statement.org/) <http://www.consort-statement.org/>

[Gutenberg Project](http://www.gutenberg.org/) <http://www.gutenberg.org/>

[Infotrieve document delivery](http://www4.infotrieve.com/default.asp) <http://www4.infotrieve.com/default.asp>

[La Trobe University - Bundoora Library](http://www.lib.latrobe.edu.au/) <http://www.lib.latrobe.edu.au/>

[Macquarie Dictionary](http://www.macquariedictionary.com.au/) <http://www.macquariedictionary.com.au/>

[MeSH basics \(NLM\)](http://www.nlm.nih.gov/bsd/disted/mesh/) <http://www.nlm.nih.gov/bsd/disted/mesh/>

[Medline - PubMed](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?holding=iauahlib_fft_ndi)

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?holding=iauahlib_fft_ndi

[NCI's CancerNet Cancer Information](http://cancernet.nci.nih.gov/) <http://cancernet.nci.nih.gov/>

[NLM Gateway Search](http://gateway.nlm.nih.gov/gw/Cmd) <http://gateway.nlm.nih.gov/gw/Cmd>
[National Library for Health \(UK\)](http://www.library.nhs.uk/Default.aspx) <http://www.library.nhs.uk/Default.aspx>
[National Library of Australia](http://www.nla.gov.au/) <http://www.nla.gov.au/>
[National Library of Medicine \(NLM\)](http://www.nlm.nih.gov/) <http://www.nlm.nih.gov/>
[Ovid Medline tute - Dule Uni](http://www.mclibrary.duke.edu/training/ovid) <http://www.mclibrary.duke.edu/training/ovid>
[Pharmaceutical Society of GB](http://olib.rpsgb.org.uk/olibcgi/ntxcgi.exe) <http://olib.rpsgb.org.uk/olibcgi/ntxcgi.exe>
[PubMed Central UK](http://www.ukpmc.ac.uk/) <http://www.ukpmc.ac.uk/>
[PubMed Central](http://www.pubmedcentral.nih.gov/index.html#journals) <http://www.pubmedcentral.nih.gov/index.html#journals>
[Subito - document delivery](http://www.subito-doc.de/?lang=en) <http://www.subito-doc.de/?lang=en>
[TOXNET Home](http://toxnet.nlm.nih.gov/) <http://toxnet.nlm.nih.gov/>
[The British Library](http://www.bl.uk/) <http://www.bl.uk/>
[The National electronic Library for Medicines](http://www.nelm.nhs.uk/home/default.aspx) <http://www.nelm.nhs.uk/home/default.aspx>
[University of Melbourne journals](http://www.lib.unimelb.edu.au/collections/medicine/biomed_j.htm)
http://www.lib.unimelb.edu.au/collections/medicine/biomed_j.htm
[VCP - Monash University](http://www.lib.monash.edu.au/pharmacy/) <http://www.lib.monash.edu.au/pharmacy/>
[Vietnam CIMSI](http://www.cimsi.org.vn/ENGLISH/Index.htm) <http://www.cimsi.org.vn/ENGLISH/Index.htm>

Natural Medicines

[HerbMed](http://www.herbmed.org/index.asp) <http://www.herbmed.org/index.asp>
[Herbal safety news \(UK MCA\)](http://www.mca.gov.uk/ourwork/licensingmeds/herbalmeds/herbalsafety.htm)
<http://www.mca.gov.uk/ourwork/licensingmeds/herbalmeds/herbalsafety.htm>
[IDIS Herbal Links](http://www.uiowa.edu/~idis/herbalinks/) <http://www.uiowa.edu/~idis/herbalinks/>
[IMGateway](https://www.imgateway.net/wheel.htm#wheel) <https://www.imgateway.net/wheel.htm#wheel>
[National Center for Complementary and Alternative Medicine \(NCCAM\)](http://www.nccam.nih.gov/)
<http://www.nccam.nih.gov/>
[Natural Medicines Comprehensive Database](http://www.naturaldatabase.com/) <http://www.naturaldatabase.com/>
[Office of Dietary Supplements \(US\)](http://ods.od.nih.gov/) <http://ods.od.nih.gov/>
[Phytotherapies.org](http://www.phytotherapies.org/) <http://www.phytotherapies.org/>

Pharmacy Organisations

[American Society of Health-System Pharmacy \(ASHP\)](http://www.ashp.org) <http://www.ashp.org>
[Australian Association of Consultant Pharmacy](https://www.aacp.com.au/) <https://www.aacp.com.au/>
[European Society of Clinical Pharmacy](http://www.escpweb.org/) <http://www.escpweb.org/>
[FIP](http://www.fip.nl/) <http://www.fip.nl/>
[Pharmaceutical Defence Ltd \(PDL\)](http://www.pdl.org.au/) <http://www.pdl.org.au/>
[Pharmaceutical Society of Australia](http://www.psa.org.au/) <http://www.psa.org.au/>
[Pharmacy Board of NSW](http://www.pbns.w.org.au/) <http://www.pbns.w.org.au/>
[Pharmacy Board of Qld](http://www.pharmacyboard.qld.gov.au/) <http://www.pharmacyboard.qld.gov.au/>
[Pharmacy Board of Victoria](http://www.pharmacybd.vic.gov.au/) <http://www.pharmacybd.vic.gov.au/>
[Pharmacy Guild of Australia](http://www.guild.org.au/) <http://www.guild.org.au/>
[Royal Pharmaceutical Society of Great Britain](http://www.rpsgb.org.uk/) <http://www.rpsgb.org.uk/>
[SHPA](http://www.shpa.org.au/) <http://www.shpa.org.au/>

Pharmacy Schools in Australia

[Charles Sturt University \(NSW\)](http://www.csu.edu.au/faculty/health/biomed/) <http://www.csu.edu.au/faculty/health/biomed/>
[Curtin University \(WA\)](http://www.curtin.edu.au/curtin/dept/pharmacy/) <http://www.curtin.edu.au/curtin/dept/pharmacy/>
[James Cook University \(Qld\)](http://www.jcu.edu.au/fmhms/school/pms/) <http://www.jcu.edu.au/fmhms/school/pms/>
[La Trobe University \(Vic.\)](http://www.bendigo.latrobe.edu.au/biolsc/pharmacy.htm) <http://www.bendigo.latrobe.edu.au/biolsc/pharmacy.htm>
[Monash University \(Melbourne\)](http://www.vcp.monash.edu.au/) <http://www.vcp.monash.edu.au/>
[Remedy - Monash University](http://www.remedy.mpsa.org.au/) <http://www.remedy.mpsa.org.au/>
[University of Queensland](http://www.uq.edu.au/pharmacy/) <http://www.uq.edu.au/pharmacy/>
[University of South Australia](http://www.unisa.edu.au/pmbs/) <http://www.unisa.edu.au/pmbs/>
[University of Sydney](http://www.pharm.usyd.edu.au/) <http://www.pharm.usyd.edu.au/>
[University of Tasmania](http://www.healthsci.utas.edu.au/pharmacy/pharmacy.html) <http://www.healthsci.utas.edu.au/pharmacy/pharmacy.html>

Search Engines

[ANZWERS](http://www.answers.com.au/) <http://www.answers.com.au/>
[Alltheweb](http://www.alltheweb.com/) <http://www.alltheweb.com/>
[AltaVista - Australia](http://au.altavista.com/) <http://au.altavista.com/>
[AltaVista Translations](http://babelfish.altavista.com/translate.dyn) <http://babelfish.altavista.com/translate.dyn>
[Dogpile](http://www.dogpile.com/) <http://www.dogpile.com/>
[GOeureka](http://www.goeureka.com.au/standard.php) <http://www.goeureka.com.au/standard.php>
[Google Scholar](http://scholar.google.com/) <http://scholar.google.com/>
[Google](http://www.google.com/) <http://www.google.com/>
[HotBot](http://hotbot.lycos.com/?query=) <http://hotbot.lycos.com/?query=>
[LookSmart](http://www.looksmart.com/) <http://www.looksmart.com/>
[Lycos](http://www.lycos.com/) <http://www.lycos.com/>
[MetaCrawler](http://www.metacrawler.com/index.html) <http://www.metacrawler.com/index.html>
[MetaEureka](http://www.metaeureka.com/) <http://www.metaeureka.com/>
[Scirus - for scientific information](http://www.scirus.com/) <http://www.scirus.com/>
[Yahoo](http://www.yahoo.com/) <http://www.yahoo.com/>