

# **Drug and Poison Information Services**

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# Drug Information - Introduction

- **Fundamental responsibility of clinical pharmacist**
- **Drug Information refers to the provision of unbiased, well-referenced, and critically evaluated up-to-date information on any aspect of drug use**
- **Information may be specific to individual patient as integral part of pharmaceutical care, or relative to a group of patients, in the context of disease management program**
- **May also be provided or needed for academic or research purposes**
- **Increasing consumer awareness, more active participation of insurance agencies in healthcare and the integration of new health technologies is rapidly changing the healthcare environment in India – which provides an opportunity**

- **Drug Information Service (DIS)** refers to activities that are part of the overall pharmacy service or pharmaceutical care process
- The term **“medicines information”** is used to highlight that the service’s functions relate to medicinal drugs rather than drugs of abuse
- **“Drug Information Center”** refers to the specialized facility that provides drug information to those who need it.

# Poison information Service

- **Poisons information refers to a specialized area of drug information that provides information on toxic effects of an extensive range of chemicals, including plant and animal toxins.**
- **Provision of such information by specialized center called as Poison Information Center**
- **This term refers to a center that specialized in the research, management and dissemination of toxicity information**
- **The skills needed for drug information and poison information are similar, but additional specialized reference are needed in poisons information**
- **A poison information center needs to operate 24 hours each day and should be able to provide an immediate response regarding treatment recommendations for any potential poison, whether a medication, chemical, household product or natural toxin.**

# Drug Information Service - History

- The term drug information was developed in the early 1960s
- The first DIC was established at the University of Kentucky in 1962.
- Center was established to act as a source of selected, comprehensive drug information for staff physicians and dentists to evaluate and compare drugs
- Several other DICs were established in the US, UK, Australia and Canada
- A new breed of pharmacists known as 'drug information specialists' developed at this time
- In US many DICs are situated in hospitals and are a part of pharmacy services provided to the hospital

# Drug Information in India

- The ever increasing patient load on our clinicians, the increasing demand for better healthcare delivery and decreasing budgetary support, drug information services are very relevant in India
- DICs services are in infancy, and we have only few services that qualify as drug information centers
- Most of these are located in hospitals and providing services to the health care professionals
- Some pharmaceutical industries are having medicines information centers, which are providing some useful information about the company's product but they do not provide independent, unbiased drug information
- The information may provide may be incomplete, selective and influenced by the commercial interests of the sponsoring company

# Drug Information Centers in India

- All India Institute of Medical Sciences Poison Information Center, New Delhi
- CMC, Vellore – Drug Information Center, Tamilnadu
- Victoria Hospital, Bangalore, Karnataka
- CDMU Documentation Center, Kolkata, West Bengal
- JSS Hospital, Mysore, Karnataka
- JSS College of Pharmacy, Ooty, Tamilnadu
- Karnataka State Pharmacy Council, Bangalore, Karnataka
- Kasturba Medical College Hospital, Manipal, Karnataka
- Kempegowda Institute of Medical Sciences, Bangalore, Karnataka
- Maharashtra State Pharmacy Council, Mumbai, Maharashtra
- Pharma Information Center, Chennai, Tamilnadu
- Sri Ramachandra Medical College Hospital and Research Institute, Chennai, Tamilnadu
- Sri Ramakrishna Hospital, Coimbatore, Tamilnadu
- Trivandrum Medical College Hospital, Trivananthapuram, Kerala

# Why we need DICs in India?

- Growth of clinical pharmacy education and practice
- Growth of information technology
- Focus on evidence-based medicine
- Complexity of drug use
- Consumer awareness



# Clinical Pharmacy education and practice

- Drug information pharmacists need to have a good knowledge of pharmacotherapeutics, clinical experience, good written and verbal communication skills and drug information skills.
- The development of DIS has been restricted due to lack of pharmacists with this training and experience
- Now we have more clinical trained pharmacists and post-graduate training in clinical pharmacy education and practice

# Growth of information technology

- **Developments in information technology have improved our ability to store and access the vast amount of drug information**
- **Computer based data bases are now available for a variety of requirements**
- **Many of these databases are expensive and may not be affordable for individual pharmacists and small hospitals**
- **Can afford to purchase a variety of information resources since they cater the needs of a larger user population**
- **The internet access has provided millions of users with access to online information including scientific literature, government publications and many other text, graphical and audio-visual resources from different parts of the world**
- **Drug information resources available online are not peer-reviewed and the information contained in them needs to be carefully evaluated**

# Focus on evidence based medicine (EBM)

- EBM is an approach to practice and teaching that integrates current clinical research evidence with pathophysiologic rationale, professional expertise and patient preferences
- DI skills help pharmacists to access EBM resources, which can be used in drug information, the development and implementation of therapeutic guidelines and clinical pathways, drug use evaluations and advice on disease state management
- Pharmacists now have the opportunity to undergo the EBM training which will help them to offer quality of drug information

# Complexity of drug use

- Drug therapy is a complex issue
- The high cost of some therapeutic and treatment procedures, together with patient demand for fast-acting, symptomatic treatment often results in empirical drug therapy
- Clinical pharmacy training enable pharmacists to take an active role in ensuring safe and effective drug use, including the provision of drug information to clinicians both in hospitals and in the community

# Consumer awareness

- Consumer awareness on medication use is tremendous in India due to increasing healthcare costs and improved access to the health information
- Participation in healthcare by the individual is deciding the access to health information
- The easy accessibility of unregulated health information over the internet may result in potentially misinformed consumers
- Increasing consumer awareness and access to information by patients are now providing opportunities for our pharmacists to meet the information needs of the public

# Drug Information Sources

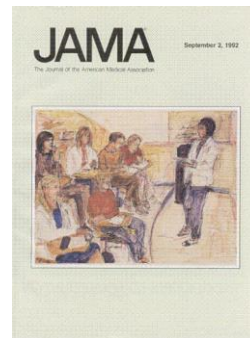
- Drug information is stored in a variety of media including textbooks, journals, newsletters, microfiche, optical disks and computer systems.
- Skills to identify the most appropriate resources to consult in a given clinical situation and to apply these resources determine the quality of drug information provided
- This requires knowledge of the content of the resources as well as proficiency in searching.
- The usual approach to many DI queries is to first consult the tertiary and secondary resources, followed by primary resources if necessary.
- The type of requester may dictate which resources are used in answering queries.
- Information to patients may be provided from tertiary resources whereas information to physicians may often require reference to the secondary and primary literature

# Drug Information Sources – Primary sources

- Primary literature consists of research studies or clinical experience which has not been previously published.
- This includes clinical trials, short reports, case reports and letters to the editor which describe clinical events such as ADR or unexpected clinical outcomes.
- The term primary literature refers to the type of article rather than the source of publication. E.g. results of a clinical trial of a new antihypertensive drug published in a medical journal is an example of primary literature, whereas a general review of antihypertensive drug therapy is not considered as primary literature
- More than 20,000 biomedical journals are published annually
- Example: annals of internal medicine, clinical pharmacology and therapeutics, journal of American medical association etc.
- Primary sources are most up-to-date resources for information.

# Drug Information Sources – Primary sources (1)

- For drug information purposes the full text of articles should be consulted so that the strength of the research methods and generalisability of the results can be evaluated.
- Literature evaluation skills are essential for pharmacists providing drug information
- Pharmacists must learn to systematically review and critique biomedical literature so as to efficiently and effectively determine the validity of the results of studies and their applicability in clinical practice



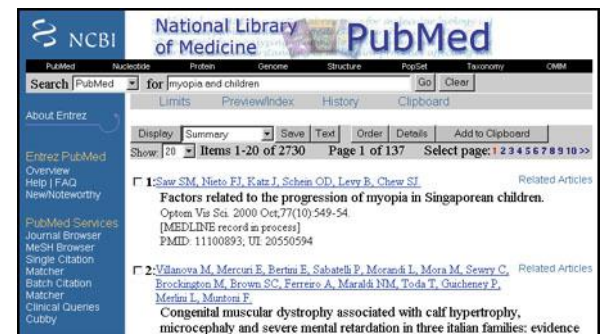


# Drug Information Sources – Secondary sources

- Secondary sources provide an overview of previously published work, and include indexing and abstracting services of the primary literature
- E.g. DRUGDEX, International Pharmaceutical Abstracts (abstracting services); BIOSIS previews, ClinAlert, Embase, Iowa Drug Information Services [IDIS] (indexing services)
- Indexing services provides bibliographic information that is indexed by topic and provides the original abstract or full text with no interpretation.
- Abstracting services provides 'content' by interpreting the original reports and creating summaries based on the abstract editorial guidelines.
- Although most of these resources provide access to primary literature, each covers different biomedical journals, meeting abstracts and newsletters.

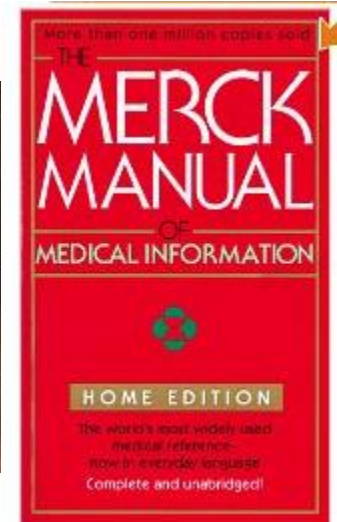
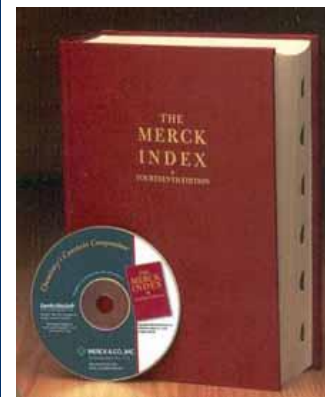
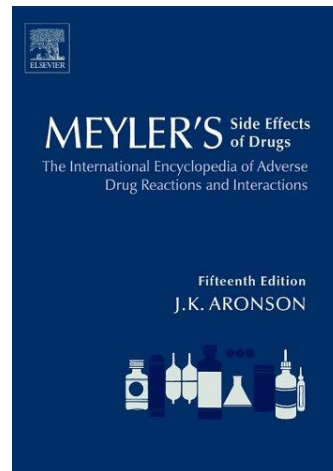
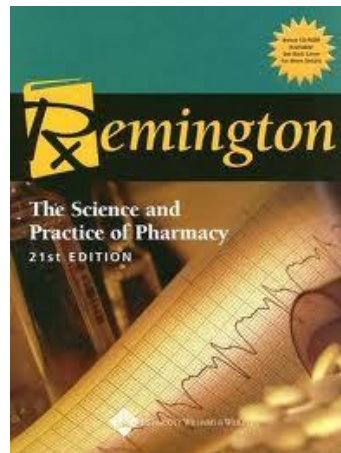
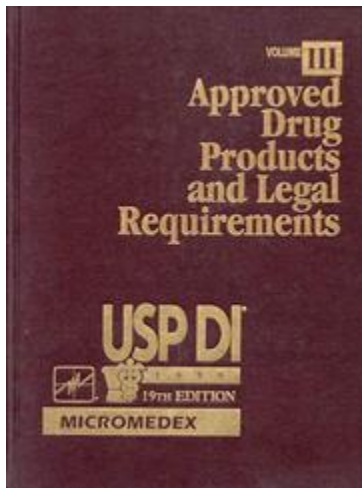
# Drug Information Sources – Secondary sources (2)

- Accessing more than one secondary resource may therefore allow more thorough information retrieval.
- Secondary resources are available both online and in CD-ROM, the CD format is preferred
- Online searching is especially useful for searching databases that are seldom used, to access information from remote locations without networking capabilities and for use by singly users
- E.g. online resources include PUBMED from the National Library of Medicine (NLM), which is free of charge and may be of help to pharmacists and organizations who cannot afford to pay for database



# Drug Information Sources – Tertiary sources

- These consist of general literature including textbooks and full-text computer databases
- E.g. USPDI, Meyler's Side Effects of Drugs, Remington's Pharmaceutical Sciences (RPS), Merck Index, Red Book, Martindale: The complete Drug Reference, AHFS Drug Information, Physicians Drug Reference, The Merck Manual etc.



# Drug Information Sources – Tertiary sources (3)

- In addition, review articles published in biomedical journals may be used as tertiary sources.
- General review articles published in peer reviewed journals which contain background information on the subject discussed along with comprehensive review of the literature by an acknowledged expert in the field is considered as tertiary source.
- It is the most commonly used sources of information because they are easy to use, convenient, concise and compact.
- However, some disadvantages associated with this sources are not complete, topics may be presented with insufficient detail due to space limitations of the text book, new textbooks may be several years out of date owing to the time lag that occurs from the time of book is written to publication
- Standards of medical practice may change during this time lag, hence a new book may not contain all the relevant current information

# Drug Information Sources – Tertiary sources (4)

- **Points to consider while evaluating tertiary literature are**
  - Expertise and experience of the author
  - Currentness of the literature
  - Appropriateness of the citations used
- **Clarity, conciseness and easy of use of the literature**
- **The tertiary resources needed in a particular institution will depend on the clinical setting, types of patients serviced and budgetary support.**
- **Resources are available in many formats, including hardcopy, microfiche and CD-ROMs.**
- **Networked versions of the resources offer the advantage of availability at multiple locations concurrently.**

# Drug Information Sources – Other sources

- When queries cannot be answered using the above-mentioned resources, alternate sources of drug information can be used.
- Efficient use of these requires some ingenuity and a little common sense
- Some of the alternative sources of drug information include the internet, list serves, local, national, professional and government organizations and pharmaceutical manufacturers.
- However, much of the quality information is available only through licensed databases.
- Subscribing to these is costly for individual pharmacists and small organizations
- But DICs are able to address this gap by providing access to a variety of drug information resources.

# Drug Information Sources – Other sources (1)

- Technology for accessing the internet has improved and makes it possible for pharmacists to access online information at a faster rate
- Clinically trained pharmacists should learn how to navigate websites of interest and consider becoming a member of relevant mailing lists such as Medscape etc.
- Some of the most useful online sources:
  - [www.clinicalevidence.com](http://www.clinicalevidence.com)
  - [www.cdc.gov](http://www.cdc.gov)
  - The Cochrane collaboration [www.cochrane.org](http://www.cochrane.org)
  - [www.freemedicaljournals.com](http://www.freemedicaljournals.com)
  - National Library of Medicine (NLM)
- Locating information on the web can be difficult, but it can be even more difficult to distinguish between good and poor quality information.
- The ability to assess the quality of information obtained from the web is increasingly important for pharmacists, not just for their own information but also for the benefit of the students

# Drug Information Sources – Other sources (2)

- In order to ensure the quality of information obtained through the web, pharmacy professionals need to be as aware of the criteria to evaluate the web as they are for other 'traditional' sources.
- When it comes to websites, one should ask for the following questions?
  - (1) Is there an author of the document?
  - (2) Is the site sponsored by a group or organization?
  - (3) Is there a date on the document or website?
  - (4) How reliable are the links?
- In order to obtain quality information, including websites, one should appraise a source by examining the bibliographic citation, which usually has three major components:
  - Title, author and publication information
- Other factors such as the date of publication, and the objectivity and reasoning of the document's content also help to determine the usefulness of the source in question.



# Drug Information Sources – Search Engines

- Google, Alta Vista, Yahoo and Lycos
- Meta search engine – copernic agent

# Approach to answering drug information queries

- **What are the common query we receive at DIC?**
  - Therapeutics
  - Adverse drug reactions
  - Dosage and administration
  - Drug interactions
  - Drug use in pregnancy and lactation
  - **How about drug pharmacokinetics?**
  - **Pharmaceutical product stability and**
  - **Drug availability?**
- **Query related to patient-specific OR query related to current thinking of medical practice in treating particular disease OR addressing particular problem?**
- **Well established DIC maintain search patterns for common type of questions**
- **The database thus created will help to minimize the time spent on searches while maximizing the efficiency of information dissemination**

# Approach to answering drug information queries (1)

- When responding to requests for information, pharmacists should recognize that their responsibility does not end with answering question.
- Many responses are used to assist in resolving therapeutic uncertainties or in optimizing patients' drug therapy.
- Determining what a requester actually needs to know is the first step in answering a question, for that DI pharmacist should develop a systematic approach in answering the DI query.

# Approach to answering drug information queries (2)

- Drug information requests are usually vague?
- For an example: “What is the dose of gabapentin?”
- The information needed may actually be one of the following:
  - Dose of gabapentin in a 10 year old
  - Dose of gabapentin in a patient with renal impairment
  - Dose of gabapentin for epilepsy
  - Dose of gabapentin for neuropathic pain

# Modified systematic approach for answering drug information queries

- Secure demographics of requester
- Obtain background information
- Determine and categorize the ultimate question
- Develop search strategy and conduct search
- Perform evaluation, analysis and synthesis
- Formulate and provide response
- Conduct follow-up and documentation

# Modified systematic approach for answering drug information queries (1)

- **Secure demographics of requester**
- **The requester's name, position, training and anticipated knowledge are important to determine the approach and final response to the question**

**Eg: For an elderly patient and a cardiovascular specialist may each enquire about the availability of an investigational medication –**

**This question brings two different frame of reference to the request**

# Modified systematic approach for answering drug information queries (2)

- **Obtain Background information**
- **It is essential to use the modified systematic approach effectively**
- **However, it is an very difficult step**
- **Good background information regarding the query will save lot of time and assumption(!) of information**
- **Sufficient background information must be obtained in a limited time period and it should be specific for the nature of the request**
- **What to collect?**
  - **Patient age, weight, sex**
  - **Diagnosis**
  - **Medications**
  - **Co-morbid conditions**
  - **Hepatic and renal function**

# Modified systematic approach for answering drug information queries (3)

- **Determine and categorize the ultimate question**
- **Try to categorize the general question**
- **Adequate background information is needed to determine the ultimate question**
- **Question should be categorized, as it will help in developing the search strategy**

**For example:**

**The safety of prescribing metronidazole to a patient taking simvastatin**

**- Categorize as drug interaction category**



# Modified systematic approach for answering drug information queries (4)

- **Develop search strategy and conduct search**
- **Selection of resources – based on the probability of containing the desired information or data**
- **For example: Metronidazole with Simvastatin**

**I would prefer: Tertiary sources**

**If any one drug is recently introduced drug, then MEDLINE search would be beneficial**

- **The resources used in answering the question should be documented, as this will help in understanding the usefulness of various resources at times of budget allocation**

# Modified systematic approach for answering drug information queries (5)

- **Perform evaluation, analysis and synthesis**
- **The information retrieved must be critically reviewed**
- **Application of the techniques and skills for literature evaluation and a knowledge of statistical analysis may be used**
- **For the response to be relevant and useful to the requester, the information must be analyzed and synthesized with consideration of the background information obtained previously**
- **Analysis involved the critical assessment of the nature and merit of factors which may be relevant to the question**
- **It requires thoughtful review and evaluation of the weight of available evidence**
- **Synthesis involves the careful integration of critical information about the patient, disease and medication along with pertinent background information to arrive a judgment or conclusion.**
- **Analysis and synthesis together assist in forming opinions, arriving at judgments, and ultimately drawing conclusions.**
- **They can give existing information new meaning and in effect, create new knowledge.**

# Modified systematic approach for answering drug information queries (6)

- **Formulate and provide response**
- This involves a series of steps that must be performed completely, objectively and in a logical sequence.
- Patient factors, disease factors, medication history and other relevant background information and special circumstances should be considered
- Once this data is collected and carefully assembled it must be critically analyzed and evaluated before providing the final response.
- The way in which answers are communicated plays a major role in determining how drug information is accepted by physicians
- The response to a question must include restating the request and clearly identifying the problems, issues and circumstances that are relevant to the question
- Conflicting viewpoints or considerations should be clearly stated
- Assessment of the literature or information reviewed and superiority of any of the information should be stated
- The strengths and weaknesses of different viewpoints should be stated and a logical argument favoring a viewpoint considered superior should be made
- Specific recommendations must be scientifically sound and clearly justified
- In hospital – many responses are in verbal; should be brief, concise, accurate & in-time

# Modified systematic approach for answering drug information queries (7)

- **Conduct follow-up and documentation**
- Follow-up is the process of verifying the appropriateness, correctness, and completeness of a response after it has been given.
- When recommendations are made, follow-up should always be done in a timely manner, which will allow to know if the recommendations were accepted and implemented.
- Patient specific requests generally provided opportunities for follow-up
- In a hospital setting this may involve visiting the ward and offering additional advice and information
- This type of follow-up provide opportunities for pharmacists to become involved in direct patient care, independently of ward round participation or routine patient counseling.

# Modified systematic approach for answering drug information queries (7)

- **Conduct follow-up and documentation**
- **Documentation of DI query is essential for purpose of quality assurance, budget allocation, promotion of the DI service and to minimize liability**
- **The documentation may be as a simple form or an extensive review and summary of all processes completed**
- **Evidence of improved outcomes will provide an opportunity for justification of the service and its funding**
- **It is important to incorporate quality assurance activities into a DI service**
- **Quality assurance is usually performed retrospectively and may, for ex: involve peer review audits of randomly selected responses**
- **Another approach is to ask requesters for feedback about the service they received, and whether the information met their needs and was provided within an acceptable time.**

## **DIS - Conclusion**

- **Pharmacy profession is moving from a dispensing oriented profession to a clinical and information oriented profession**
- **Clinical training and information technology have assisted pharmacists to develop their role in drug information**
- **New technologies and resources for locating drug information are likely to become available near future**
- **Increasing ease of access to information will enhance the ability of pharmacists to provide comprehensive drug information**
- **Individuals with expertise in both clinical pharmacy and drug information will soon play a leading role in pharmaceutical care in India**