**Information Resources**

With the expanding role of pharmacists, drug information evaluation and retrieval have become skills essential to the profession. Pharmacist should be able to “retrieve, analyze, and interpret the literature to provide drug information and counseling to patients, their families or care givers, and other involved health care providers.” All pharmacists have the responsibility to be effective drug information providers.

For example, the community pharmacist can be asked an array of questions every day. The most common questions are related to dosage and administration, adverse effects, drug interactions, pharmacotherapy, and disease management, including the use of nonprescription medications and dietary supplements.

With the development of new drugs and the advancement of medication therapy, it has become very difficult for pharmacists and other health care professionals to keep abreast of all these changes. Furthermore, patients are continually becoming more involved with their health care by retrieving information independently. Although pharmacists may not always have the answer to every question, they should know how to approach a question and where to locate this information. In the research for appropriate recommendations, there is an assortment of drug information resources to choose from. Knowing the most appropriate resource to use in each situation and how to effectively use those tools will increase the likelihood of answering each particular question completely and efficiently.

There are three categories of drug information resources based upon their proximity to the original source of information: primary, secondary and tertiary. Primary resources are considered the raw material created and written by an individual, a team or organization. Once published, this information serves as the basis for secondary sources, which professionally index such studies into a database. Tertiary sources are a compilation of the primary and secondary sources and tend to be factual in nature.

**PRIMARY RESOURCES**

Primary drug information resources include randomized, controlled trials, cohort studies, case reports and others. This type of resource is considered to be the most current source of information. Some examples of primary literature that may be of interest may be found in pharmacy related journals such as *Pharmacotherapy, American Journal of Health-System Pharmacists*and *International Journal of Pharmaceutics.* In addition to the medical journals such as the *Lancet,*and *British Medical Journal.*

Advantages to the use of primary drug information resources include the ability to read details about the individual studies, such as design, demographics and statistical analysis, and to assess the validity of the study results. In addition, primary literature is the most up-to-date information available; however, there are some disadvantages to the use of primary resources. First, the outcomes and conclusions made in these resources may be misleading as they are based upon a single clinical trial. Second, the reader must be familiar with the process of evaluating pharmacy and medical literature, and last, readers must dedicate much time to review the vast amount of available primary literature.

**SECONDARY RESOURCES**

Secondary resources serve as gateways to primary drug information resources. These include indexing services, which provide bibliographic citation information and abstracting services. Most of these services are available in an electronic format. These databases will search literature from various journals, meetings and publications.Some of the more commonly used secondary resources include MEDLINE/PubMed, International Pharmaceutical Abstracts (IPA). When utilizing these resources, there are some challenges to keep in mind. Search techniques are not the same for all databases, requiring the user to be familiar with each of the various information sources.

**TERTIARY RESOURCES**

Tertiary drug information resources, which summarize and interpret the primary literature, are the most common types of references that the community pharmacist will utilize. They are a good starting point when researching a drug information question, as they are excellent sources for gaining an understanding of a new topic. Tertiary resources may include textbooks, review articles and other general data.

As with all types of information, tertiary resources have advantages and disadvantages. Some advantages include ease of use, convenience and conciseness; however, disadvantages include the lag time associated with publication, which may be as long as one to two years. It is possible that some of the information may be outdated, particularly if new guidelines or new material has been released since the time of publication of the reference. Another consideration is that the information provided may be incomplete due to space limitations or because of incomplete literature searches performed by the author(s) of the material.

Examples for common tertiary resources are as follows:

***Drug Facts and Comparisons (F&C):*** Information in *F&C*is organized by therapeutic topic. *F&C*utilizes helpful summary and comparison tables in order to facilitate easy comparison of products within the same class. It is available in many different formats (bound books, CD-ROM, Web access),

***Physicians’ Desk Reference (PDR):*** Itis a compilation of drug package inserts. A new *PDR*is published every year. It is also important to note that only FDA-approved indications and dosages can be found within the *PDR*. Another version is ***PDR for Nonprescription Drugs, Dietary Supplements and Herbs.***

***Educational Textbooks:***Textbooks of therapeutics such as *“****The Clinical Use of Drugs****”*. It is useful when an overview of a disease state is necessary. Similarly, the ***Handbook of Nonprescription Drugs*** *and* ***Handbook of dosage forms.***

***Clarke’s Analysis of Drugs and Poisons***

***Remington: The Science and Practice of Pharmacy***

***Martindale; the Extra Pharmacopoeia***

***Pharmacopoeias***

Are issued by highly specialized persons in pharmacy and medicine and are authorized by governments or international agencies, Example Egyptian Pharmacopeia, United States Pharmacopoeia/ National Formulary (USP/NF) and The British Pharmacopoeia (BP).

Tertiary references also include Internet-based resources such as ***Micromedex***.

Many reputable Web sites are useful for obtaining information. The ***Food and Drug Administration*** (FDA)’s Web site is an important source of information regarding the most recent drug-related news, including drug approvals, recalls, and safety warnings.

Resources, whether in print or online, should be assessed for quality and reliability. First, the source of information in terms of authors and editors should be questioned. Are the authors well qualified to write on the topic? Second, the information should be appropriately referenced and evidence based. Third, financial disclosures should be made. Fourth, the information should be as current as possible. Other aspects that may be assessed include ease of use, portability (if necessary), and cost. Web sites should be assessed for quality as well.