Drug Information Center

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Abstract

The purpose of the Drug Information Center (DIC) is to serve health care professionals throughout India by answering critical questions on drug use and its possible side effects. The DIC routinely responds to inquiries regarding appropriate therapy for specific patients; adverse reactions to drugs; efficacy of drugs; drug interactions; intravenous additive incompatibilities; biopharmaceutic and pharmacokinetic parameters of drugs; dosing in renal failure; appropriate therapy for a disease state; identification of foreign drugs; information on investigational agents; and information on new drugs. The purpose of the service is to provide accurate, current and unbiased drug information in the promotion of rational drug therapy.

INTRODUCTION

In 1962, the first drug information center was opened at the University of Kentucky Medical Center and was intended to be utilized as a source of selected, comprehensive drug information for staff physicians and dentists to allow them to evaluate and compare drugs besides catering to the information needs of nursing staff. The staffs of the drug information center were expected to take an active role in the education of health professionals within the institution [1]. In 1973, the first formal survey identified 54 drug information centers in the USA [2]. According to a report published in 1995, there are about120 full-fledged pharmacist-operated drug information centers in the United States, which accept a broad scope of requests from health care professionals [3].

The provision of accurate and timely drug information to health care professionals is an important mechanism to promote safe and effective drug therapy. Such service is lacking in India [4]. Hence, the purpose of the center is to provide accurate, current, and unbiased information for the promotion of rational drug therapy [5]. The center also provides relevant information to physicians and faculty of the medical academy on evidence-based medicine at their request.

Drug Information Centre was reviewed retrospectively. Journals were the most frequently used literature source (36% of all quotations). Commonly used medical and clinical pharmacology journals, together with standard textbooks, provided the necessary information to solve more than 50% of drug information requests. Most questions could be answered by including the complementary use of the question/answer database Drug line. Drug information access is important for the improvement of rational use of drugs. According to the present study, this activity is possible with a fairly limited number of sources.

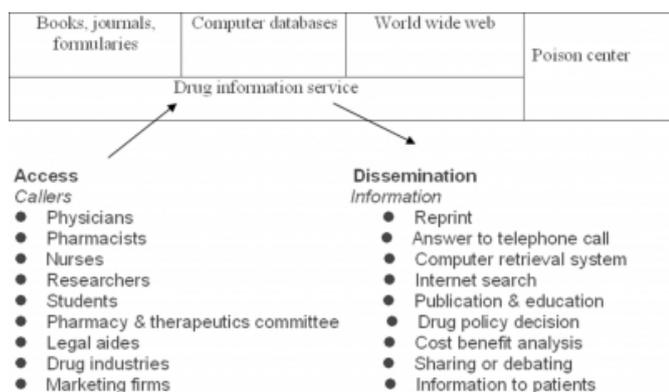## DRUG INFORMATION CENTER
I. SETUP AND EQUIPMENT

The center is equipped with computer terminals, printed materials (current, periodicals, bound journal volumes, reference texts) and has access to Medline, the Internet and various other online drug and medical references.

The center maintains subscriptions to nationally recognized journals and texts of Pharmacy and Medicine.

Direct access to computerized on-line data searching, CD ROM databases and the World Wide Web are also available.(Table 1)

Figure 1

Table 1: The working model of drug information service

II. STAFF, STUDENT AND TIME

One full-time Director, one full-time Resident and six pharmacy students form the staff at the drug information center. This center also serves as a training site for undergraduate and postgraduate study in Pharmacy.

Drug information requests may be initiated in person, by phone, fax, e-mail or by mail. The center is accessible by telephone 24 hours a day.

III. SERVICE ACTIVITIES

The staff answers questions on drug related matters, particularly to those related to safety of drug.

The doctors, Pharmacists and patients could visit the center in person to get information.

The literature searches are provided free of charge to all hospital faculty, clinicians, and pharmacy staff for patient specific issues and for research as well as teaching activities.

Those services, which are not related to the activities of the university are charged with a fee. The reimbursements for services are requested from organizations such as law firms, pharmaceutical companies and marketing firms.

The center is accessible to undergraduate or graduate students working on special projects or patient care activities but does not provide services for students working on class assignments or preparing for tests.

Since one of its aims is to promote physician-pharmacist-patient relationships it does not advertise to the lay public.

General information is provided to patients for immediate information needed but they are strongly urged to consult with their treating physician.

The center also provides written information in the form of articles, news-letters and journal columns to encourage and inform health professionals on rational drug therapy.

An adverse drug reaction (ADR) monitoring and reporting program is in place which provides guidance for the monitoring, detection, reporting and evaluations of ADRs in the hospital. It also promotes ADR awareness and information dissemination to the medical, nursing and pharmacy staff. The data generated is used by the Pharmacy and Therapeutics Committee to ensure drug safety.

The center also participates in the ADR reporting program of Food & Drugs

Administration (FDA) and has 'The Product Problem Reporting' system to ensure drug safety by providing guidance in the event of a defect in the quality of drugs (for example: color change in tablet or particulate matter in infusion fluid).

EVALUATION OF PERFORMANCE

Analyzing the results of the consults volume according to the request types, it was found that the most common request types were for general information about a drug, its identity, drug interaction or therapeutic use.

I. STATISTICS REPORT

In India, the Karnataka State Pharmacy Council established its Drug Information Center in August 1997 to disseminate unbiased drug information to healthcare professionals. According to their performance, the center received 1002 queries for the period from August 1997 to July 2000. The queries from doctors were only 132 (13.2%). Rests of the enquiries were from patients, pharmacists and drug regulatory authorities. After the awareness programme, the total number of queries received for the period of August 2000 to January 2002 was 1592 and 658 (41.3%) were from doctors. Rests 59% of the enquiries were from patients, pharmacists and drug regulatory authorities. This was achieved within 18 months period as compared to first three years record (only 13.2%) from doctors.

The majority of queries (75%) were received from Bangalore. Response time was recorded and about 80% of enquiries were answered within 30 minutes. Most of the queries from doctors fell in to category of product availability / identification, contraindications / safety, adverse drug reactions, choice of drugs, banned drug information and use of drugs during pregnancy.

The DIC has received different type of enquiries from the doctors. The center was utilized more by doctors from private hospitals (50.63%) than government hospitals (32.49%) and general practitioners (GPs) (17%). The pediatricians, general physicians, dermatologists and gynecologists were the maximum users among all categories of the doctors.(Table 2)

Figure 2

Table 2: Enquirers (Doctors) category for the period of August 2000-January 2002.

Doctors category	Number (%) of queries
Pediatricians	119 (18.1%)
General physicians	109 (16.7%)
Dermatologists	116 (17.6%)
Gynecologists	70 (10.6%)
Pharmacologists	54 (8.2%)
Cardiologists	27 (4.1%)
Anesthetists	17 (2.5%)
Dentists	22 (3.3%)
ENT specialists	19 (2.8%)
Microbiologists	17 (2.6%)
Psychiatrists	18 (2.7%)
Orthopaedecians	21 (3.2%)
Endocrinologists	14 (2.1%)
Pulmonologists	11 (1.7%)
Oncologists	16 (2.4%)
Pathologists	8 (1.2%)

II. ON LINE DRUG INFORMATION CONSULTATION FORM

Figure 3

III. WHERE DO WE GET DRUG INFORMATION?

Figure 4

Table 4: Adverse Drug Reactions

Database or Textbooks	Reference Name	Notes
Database	Clinical Pharmacology	http://cpip.gsm.com/
Database	LexiComp's Clinical Reference Library	http:// www.crlonline.com/crlsq/servlet/crlonline
Database	Micromedex	www.thomsonhc.com
Online	FDA Medwatch	http://www.fda.gov/medwatch/safety.htm
Online	JHCAHO Sentinel Event Alert	http://www.jcaho.org/about+us/news+letters/
Textbook	AHFS Drug Information	
Textbook	Drug, Facts and Comparisons	

Figure 5

Table 5: Alternative Medicine/ Dietary Supplements

Database	Allied & Alternative Medicine Complimentary	http://wb5.silverpltter.com
Database	Clinical Pharmacology	http://cpip.gsm.com/
Database	LexiComp's Clinical Reference Library	http:// www.crlonline.com/crlsq/servlet/crlonline
Database	Micromedex	www.thomsonhc.com
Online	Natural Medicine Comprehensive Database	http://naturaldatabase.com
Online	Natural Standard	www.naturalstandard.com
Textbook	CRC Ethnobotany Desk Reference By T Johnson	Information is very difficult to decipher. Includes species and common name, as well as common use.
Textbook	USP DI Drug Information for the Health Care Professional	
Textbook	USP DI Drug Information for the Patient	

Figure 6

Table 6: Compounding

Textbook	Allen's Compounded Formulations By: Lloyd V. Allen Jr.	Includes recipes for commonly prepared compounded products. Applied Therapeutics: The Clinical Use of Drugs
Textbook	Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems By: LV Allen, NG Popovich, and HC Ansel	Includes chapter at a glance at the beginning of the book. This book doesn't provide specific compounding information, but does provide the basics as it pertains to compounding. Includes information about the history of pharmacy, drug standards and regulation. Includes selected information about Good Compounding Practices and laws concerning compounding. Includes detailed pharmaceutical calculations.
Textbook	Millennial Compounding Compendium: Official Formulations of the International Journal of Pharmaceutical Compounding	Includes recipes of compounded formulations. Formulations are organized based upon dosage form.

Figure 7

Table 7: Consumer Information

Database	Clinical Pharmacology	Consumer Drug Interactions
Database	Micromedex	USPDI Volume II/ Drug Dex
Textbook	USPDI Volume II	Drug information in lay language

Figure 8

Table 8: Disease States

Textbook	2001 Ophthalmic Drug Facts By: Facts and Comparisons	Provides drug monographs for various ophthalmologic agents, including dyes, and artificial tear solutions. Provides information concerning extemporaneous preparations of ophthalmic solutions, excipient glossary, as well as the American Optometric Association Clinical Practice Guidelines. Includes off labeled uses, as well as orphan drugs.
Textbook	Applied Therapeutics: The Clinical Use of Drugs	Provides information concerning general principles of pharmacy including drug allergies, acute drug toxicity and pharmaceutical care. Includes various disorders and diseases organized based upon organ system affected.
Textbook	Bates' Guide to Physical Examination and History Taking By: Lynn S. Bickley	Provides information on the physical examination, patient interviewing, vital signs, anatomy and physiology, and patient history.

Figure 9

Table 9: Dosing

Database	Drug Information Handbook	Available on LexiComp
Textbook	AHFS Essentials	
Textbook	Applied Therapeutics (KodaKimble)	Doses are within the text; Not a quick reference

Figure 10

Table 10: Drug Identification

Database	Clinical Pharmacology	Click the "Drug Products" tab, then click "Product Identification"
Database	Identidex	Micromedex, also includes slang terms
Textbook	Drug Facts & Comparisons	Color locator organizes common tablets and capsules by color; Drug Identifier CDROM

Figure 11

Table 11: Drug Information

Database comparison	Clinical Pharmacology	Monographs, overviews, drug product
Database	Drug Information Handbook	LexiComp
Textbook	AHFS Essentials	Concise information

Figure 12

Table 12: Drug Interactions

Database	Clinical Pharmacology	Can print a report after inputting a list of drugs
Database	Drug Information Handbook	Available on LexiComp
Database	Micromedex	Can print a report after inputting a list of drugs

Figure 13

Table 13: Foreign Drug Identification

Database	International Pharmaceutical Abstracts (IPA) Database	Available via Harvey Library
Database	Lowa Drug Information System (IDIS) Database	http://itsnt14.its.uiowa.edu
Database	LexiComp's Clinical Reference Library	http://www.crlonline.com/crlsq/servlet/crlonline

Figure 14

Table 14: Infectious Diseases

Textbook	Applied Therapeutics: The Clinical Use of Drugs By: MA KodaKimble, LY Young	Provides general information on the pathophysiology of infectious diseases, surgical prophylaxis, STDs, AIDS, tuberculosis, UTI's,
Textbook	Critical Care By: JM Civetta, RW Taylor, and RR Kirby	Provides information on unusual infections, how to approach febrile ICU patients, nosocomial infection information, and how to use antimicrobial drugs. Includes HIV, neurological, UTI, bacterial, fungal, and viral infections.
Textbook	Harrison's Principles of Internal Medicine By: Braunwald, Fauci, Kasper, Hauser, Longo, and Jameson	Available as 2 volumes. Provides information concerning disease manifestation, pathophysiology, and treatment.

Figure 15

Table 15: Compatibility/Stability

Database	Clinical Pharmacology	Available @: http://cpip.gsm.com
Database	Micromedex	Available @: http://www.thomsonhc.com
Textbook	American Hospital Formulary Service Drug Information (AHFS)	

Figure 16

Table 16: Monographs

Database	Clinical Pharmacology	
Database	Drug Information Handbook	Available on LexiComp
Textbook	AHFS Essentials	Brief, Limited information

Figure 17

Table 17: Pediatrics/Pregnancy

Database	LexiComp	Pediatric Dosing Handbook
Database	Micromedex	REPRORISK System
Textbook	Danforth's Obstetrics and Gynecology	

IV. ETHICAL ASPECTS

At present, drug information centers are confronted with questions from public that pose ethical dilemmas. The truthful answers to drug information questions may compete with values such as privacy, interference in the patient-physician relationship and social responsibilities [6] . Should a drug information center divulge a very pertinent question like 'bedside rationing' by a physician? [7] . New drugs like sildenafil used in male erectile dysfunction may cause social problems such as abuse by healthy men and indiscriminate prescription by the primary care physicians [8] .

V. QUALITY OF INFORMATION

Drug information centers have been criticized for providing information that is mostly passive or nonjudgmental and perhaps lacking in accuracy. It is also highlighted that, 'information is not knowledge, and knowledge comes from the interpretation of information' [9] .

CONCLUSION

The DIC has provide itself to be an impressive resource, which is used regularly as an information source by all levels of people involved in the health system from patient to provider and also contribution through providing access to up-to-date. It has been a steady increase in the number of enquiries indicating an increase in awareness of the center, as a source of unbiased drug information among the doctors. This experience should lead to develop more number of DIC's and encourage networking of DIC's in India [10] .

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