OFFICIAL PUBLICATIONS

Drug Information Services: Guidelines (2009)

Canadian Society of Hospital Pharmacists
Société canadienne des pharmaciens d'hôpitaux

Drug Information Services: Guidelines

Published by the Canadian Society of Hospital Pharmacists (CSHP), Ottawa, Ontario. 2009 edition. Use of this document was approved by CSHP Council in 2009.

Suggested citation:

Canadian Society of Hospital Pharmacists. Drug information services: guidelines. Ottawa (ON): Canadian Society of Hospital Pharmacists; 2009.

© Canadian Society of Hospital Pharmacists 1995, 2009

30 Concourse Gate, Unit 3
Ottawa ON K2E 7V7
Telephone: 613.736.9733
Fax: 613.736.5660
Internet: www.cshp.ca

Drug Information Services: Guidelines

INTRODUCTION

This is the second edition of guidelines published by the Canadian Society of Hospital Pharmacists (CSHP) regarding the provision of drug information services. These guidelines, approved by CSHP Council in 2009, replace the Guidelines for the Provision of Drug Information Services (1995).

These guidelines were developed by a group of CSHP members who are drug information pharmacists, in collaboration with the CSHP national office. The guidelines are consensus-based, reflecting current best practice in the provision of drug information services.

1. SCOPE

These guidelines provide practical information on aspects of developing and operating a drug information service. Suggested references relating to the provision of drug information are presented in Appendix A, List of Auxiliary Drug Information Resources.

The guidelines do not provide detailed information about each aspect of a drug information service provided by pharmacists, nor do they pertain to establishing a toxicology service. The guidelines do not address the legislative requirements associated with the provision of drug information services, and it is assumed that the provision of any drug information services will comply with the legislation and practice framework relevant to this area of practice.

These guidelines should be read in conjunction with the CSHP Guidelines for Practice Management.

2. GLOSSARY OF TERMS, ABBREVIATIONS, AND SYMBOLS

The following definitions apply for terms used in these guidelines. They may have different meanings in other contexts.

Client	An individual or group of individuals who receive drug information services.
Drug information	"The provision of unbiased, well-referenced, and critically evaluated information on any aspect of pharmacy practice."[1]
Drug information centre	A defined area physically separated from the pharmacy dispensary, where the drug information service operates.
Drug information pharmacist	A pharmacist who specializes in research, documentation, and provision of drug information using a modified systematic approach.
Drug information service	A formalized unit with staff and resources dedicated to providing information to health care professionals and/or the public on aspects of drug therapy. The staff and resources dedicated to the provision of drug information services usually work, where feasible, within a drug information centre.
Drug information services	The services provided by the drug information service**.** The provision of drug information services incorporates a variety of activities and typically occurs in response to one of three types of situations: a) a request from a caregiver or patient for a specific patient or group of patients;

Drug Information Services: Guidelines

	b) a need identified through general safe medication practices or by the hospital/regional formulary system committee (such as a pharmacy and therapeutics committee or pharmacotherapeutic committee); or c) a request from a person or organization (such as a lawyer or pharmaceutical company).
Evidence-based medicine	"The integration of best research evidence with clinical expertise and patient values".[2]
Hospital	**I**ncludes other related healthcare facilities that are served by the drug information service.
Implemented	Accomplished or achieved and incorporated into practice.
Internal peer review	An independent review of the drug information provided by a drug information pharmacist. The person conducting the review is employed in the same drug information centre as the person whose work is being reviewed. The reviewer documents the results of the review and provides feedback to the drug information pharmacist whose work is under review.
Modified systematic approach	A seven-step method used to research drug information inquiries: "Step I. Secure demographics of requester Step II. Obtain background information Step III. Determine and categorize ultimate question Step IV. Develop strategy and conduct search Step V. Evaluate and analyze the information Step VI. Formulate and provide response Step VII. Conduct follow-up and documentation"[3]
Primary sources of information	Sources that provide first-hand direct evidence (or research) about a particular topic, without interpretation or evaluation.[4]
Secondary sources of information	Sources that provide an interpretation or evaluation of information obtained from primary sources.[4]
Shall	A mandatory requirement.
Should	A recommendation, something that is advised but not mandatory.
Tertiary sources of information	Sources that provide compilations, analyses, or digests of secondary sources.[4]
Toxicology service	A service that provides information to healthcare professionals and/or the public for the assessment of potential toxic effects and the management of drug or chemical exposures.

3. OBJECTIVES OF A DRUG INFORMATION SERVICE

A drug information service shall support the high-quality, safe, and effective use of medications and shall discourage the use of questionable, unproven therapies. It shall improve the quality of patient care and patient outcomes through the timely provision of drug information and advice on the therapeutic use of drugs and drug information. The drug information provided shall be well organized, current, objective, independent, comprehensive, and accurate, and it shall be presented in a useful format.

4. SCOPE AND PROMOTION OF DRUG INFORMATION SERVICES

The scope of drug information services shall be defined by the needs of the clients served by the drug information service.

The drug information service shall be promoted to the client to inform them of the services available.

4.1 Defining Criteria for Potential Clients

The hospital shall define criteria to determine the potential clients of the drug information service. Where a health region is responsible for the services of a hospital, the health region should define these criteria.

4.2 Provision of a Drug Information Service

A drug information service that serves a hospital shall, on a regular basis:

a) respond to patient-specific clinical information inquiries;
b) support the hospital/regional formulary system committee and its formulary system, protocol development, and other related projects; and
c) support the learning needs of pharmacists and other health care professionals.

4.3 Provision of Additional Services

The following additional services may be provided by the drug information pharmacist where feasible:

a) prepare communication tools, such as a website, newsletters, patient information handouts, data sheets about non-marketed drugs, guidelines for parenteral administration, and therapeutic drug handbooks;
b) encourage and participate in patient-specific reporting of adverse drug reactions and medication errors;
c) participate in revising the formulary;
d) participate in data collection and evaluation, drug inventory maintenance, and/or protocol set-up for investigational drug studies;
e) participate in the Health Canada Special Access Programme, on behalf of the hospital;
f) assist in responding to supply chain issues,[5] drug shortages,[5] recalls, and discontinuations;
g) participate in medication safety initiatives;[5]
h) participate in clinical research studies;[5] and
i) participate in other direct patient care activities (such as patient counselling, medication history interviews, and discharge interviews).

4.4 Contractual Agreement to Provide Services to External Organizations

Before drug information services are provided to an external organization (such as a legal firm or a pharmaceutical company), a contract should be established between the hospital (or healthcare region, if applicable) and the external organization. This contract should include the terms and

conditions under which the drug information services will be requested, provided, and paid for.

4.5 Promotion of Drug Information Services

The drug information service shall, where feasible, develop a communication strategy to inform potential clients of the drug information services that are available to assist them in improving patient care. Any particular conditions (such as the expected level of service, hours of service, response times, or applicable fees charged) shall be communicated to all groups of potential clients.[6]

5. ACCESS TO DRUG INFORMATION SERVICES

Drug information services should be accessible to approved clients in a timely, efficient manner. Users should be able to request drug information services through a variety of means of communication (for example, face to face, telephone, facsimile, e-mail, Internet, intranet).

5.1 Hours of Service: Drug Information Centre within the Pharmacy Department

In a hospital setting where the drug information service is located within the pharmacy department, hospital personnel involved with patient care should have access to drug information services 24 hours a day, including:

a) on-site access during business hours;
b) evening and weekend coverage by staff pharmacists if on duty; and
c) after-hours coverage by an on-call staff pharmacist.

Clients external to the hospital shall be informed of the hours of operation and shall be able to leave a message after hours.

5.2 Hours of Service: Drug Information Centre outside the Pharmacy Department, Within the Hospital

In a hospital setting where the drug information service is located outside the pharmacy department, hospital personnel involved with patient care shall have access to drug information services as defined by policies for provision of after-hours service.

Clients external to the hospital shall be informed of the hours of operation and shall be able to leave a message after hours.

5.3 Hours of Service: Drug Information Centre outside the Hospital

In settings outside a hospital where the drug information service is not staffed continuously, clients shall be informed of the centre's hours of operation and will be able to leave a message after hours. Clients shall be advised to seek help from a suitable alternative source if the call is of an urgent or emergent nature (for instance, access to emergency drug information may be specified as a provision of the contract).

5.4 Access to Service by Pharmacists of the Pharmacy Department

All pharmacists in the pharmacy department should have access to the drug information service.

6. HUMAN RESOURCES

Overall responsibility for the day-to-day service shall be assigned to the drug information pharmacist.

Each person working in the drug information service shall be aware of his or her respective

responsibilities and will be trained and instructed to refer any drug or related request to a drug information pharmacist.

6.1 Number and Mix of Staff

The staff working within the drug information centre shall include a drug information pharmacist and may include other personnel such as pharmacy technicians and clerical staff.

The number and skill mix of the personnel assigned to the drug information centre shall be adequate and appropriate to meet the demands for the service.[7]

6.2 Referral to Other Experts

The drug information pharmacist may seek the expertise and knowledge of other pharmacy practitioners and/or health care professionals as needed.

6.3 Competencies of Drug Information Pharmacist

All pharmacists providing drug information shall demonstrate the following competencies:

a) effectively and efficiently gathers information;
b) critically analyzes, evaluates, selects, synthesizes, and uses scientific literature[7,8] from various sources of information (primary, secondary, and tertiary), facilities, literature retrieval systems, and electronic data processing systems;
c) efficiently applies principles of evidence-based medicine; [5]
d) effectively communicates using written and verbal communication skills, tailored to meet the needs of each requestor;
e) educates clients and contributes to the development and delivery of service education programs; [7]
f) applies knowledge regarding clinical drug use and therapeutics;
g) applies knowledge of pharmaceutical care; [9]
h) applies knowledge of the legal and ethical responsibilities associated with supplying drug information;
i) identifies and analyzes issues or trends regarding medication use (such as adverse events and medication incidents) and assists in determining the related root causes; [5,8] and
j) effectively manages projects. [7]

6.4 Clerical Services

Clerical services should be available for such duties as word processing, filing, records management, and dissemination of information developed by the drug information service.

6.5 Staff Orientation

In a hospital setting, staff working in the drug information service shall be familiar with the services provided by the pharmacy department.

6.6 Staff Training, Development, and Assessment

Programs to train, develop, and assess personnel shall be implemented to ensure that the personnel working in the drug information service area possess the required competencies to perform their duties as required.

7. FACILITIES AND EQUIPMENT

The area where drug information services are provided shall have adequate facilities to support the safe provision of drug information. The area shall be kept clean and orderly, shall be exposed to minimal distractions, shall have adequate resources to allow staff members to work safely, and shall

employ a security system that prevents access to the area by unauthorized persons.

7.1 Designation of a Drug Information Centre

In settings where the drug information service is provided by the pharmacy department, a specific area of the pharmacy department should be designated as the drug information centre.

7.2 Facility Requirements for a Drug Information Centre

The drug information centre shall have the following features:

a) adequate workspace;
b) shelving for reference texts and journals;
c) comprehensive filing system(s);
d) a dedicated telephone line;
e) a venue for posting notices, electronic or otherwise;
f) a computer with e-mail, printer, and Internet access; and
g) access to equipment for faxing, scanning, and copying documents.

8. DRUG INFORMATION RESOURCES

The drug information centre shall have adequate information resources and systems to access up-to-date, relevant information. The drug information pharmacist should have access to a bibliographic database in an electronic format, but a database in paper format is acceptable.

8.1 Reference Material for Main Pharmacy

In settings where the drug information service is provided from a location physically removed from the pharmacy, sufficient reference sources should be readily available in the main pharmacy to fulfill routine drug information requests. This material may be provided in electronic or paper format. At a minimum, the reference sources shall comply with the provincial/territorial requirements for the pharmacy.

8.2 Consultation Service for Reference Material

The drug information service should offer consultation services for the procurement of drug information references used by hospital pharmacy dispensaries and other areas served by the hospital (such as patient care areas and libraries).

8.3 Selection of Reference Material

The drug information references maintained by the drug information service shall conform, at a minimum, to the applicable legislated provincial/territorial requirements for a library maintained by a licensed pharmacy for use by its own staff.

Additional resources may be procured to suit the individual practice settings served by the drug information service. The reference material should include a mix of primary, secondary, and tertiary sources.

Note: *A list of suggested auxiliary references pertaining to specific areas of practice is provided in Appendix A.*

8.4 Selection of Drug Information Sources Not Listed in the Provincial/Territorial Requirements

The decision to select an additional drug information resource that is *not* listed in the applicable legislated provincial/territorial requirements for a pharmacy library should take into account the following considerations:

a) the practice setting served by the drug information service;
b) the attributes of the literature proposed for inclusion[10] (for instance, editorial independence, evidence-based objectivity, currency, qualifications and affiliations of author[s], organization of material presented); and
c) the additional benefits and costs in relation to the information already held by the drug information service.

8.5 Reviewing and Updating Resources

The drug information service shall regularly (at least yearly) review its non-electronic drug information resources to ensure that they are current and appropriate for the drug information services being provided. All outdated resources shall be identified as out of date and shall not be used as current reference resources.

8.5.1 Retaining Old References

The drug information service may retain old references as a means to obtain information about older medications; in these cases, the risks and limitations of using obsolete resources shall be acknowledged.

Note: *A resource is generally considered out of date when a new edition is published.*

9. BUDGET

Adequate financial resources are necessary to support the operational and capital plans of a drug information service.

9.1 Expenses

The operating and capital expenses of the drug information service should take into consideration the following cost categories:

a) personnel;
b) staff development;
c) capital facilities and equipment;
d) communication; and
e) information resources (procurement and maintenance of updates).

9.2 Revenues

Any revenues earned by the drug information service should be applied to offset the expenses incurred in the provision of the revenue-generating service.

10. POLICIES AND PROCEDURES

Written policies and procedures shall be established to promote the consistent delivery of high-quality drug information services that meet the needs of the clients and the organization and that comply with regulatory requirements. The policies and procedures should be kept up to date and should be reviewed at least every two years.

10.1 Scope of Policies and Procedures

Policies and procedures shall be developed and implemented to address the following issues:

a) setting the hours of service;
b) providing after-hours access to the service;

c) defining the population served;
d) defining the range of services that will and will not be provided;
e) selecting the information resources to be made available;
f) receiving and prioritizing requests;
g) designing and executing search strategies;
h) evaluating information;
i) preparing responses, including standardized citation of references used;
j) communicating responses;
k) providing drug information education to pharmacy undergraduate and graduate students, residents, and staff pharmacists;
l) defining methods to obtain literature reprints and other information;
m) identifying and removing out-of-date resources from circulation;
n) reporting adverse drug reactions;
o) handling of Special Access Programme drugs and investigational drugs, where this is part of the responsibility of the drug information service;
p) establishing methods to manage records (such as requests for information, responses, and statistics);
q) interpreting ethical principles for use in working through ethical dilemmas;
r) identifying and working through medicolegal issues, including liability;
s) developing indicators and plans for quality assessment and improvement;
t) defining borrowing privileges and procedures for access to and use of drug information resources by personnel outside the drug information centre;
u) setting a fee structure for information requests and surcharges for extraordinary requests;
v) establishing criteria for referring queries to another group of experts or another organization; and
w) handling media relations.

11. RECEIPT OF REQUESTS FOR DRUG INFORMATION

Requests for drug information received from defined clients of the drug information service should be handled using the modified systematic approach.

11.1 Communication of Requests

Requests may be received verbally (face to face or by telephone) or in writing (by e-mail, facsimile, or other electronic media).

11.2 Responsibilities of Drug Information Pharmacist upon Receipt of Request

Upon receipt of a request, the drug information pharmacist shall:

a) elicit, understand, and assess the requestor's needs and the urgency of the request;
b) assess the requestor's level of understanding of the clinical and professional issues related to the request;
c) identify any legal or ethical issues related to the request;
d) prioritize the request; and
e) negotiate with the requestor the time frame for the response.

11.3 Documentation of the Request

All requests for drug information shall be documented using a standardized request form or database, which shall protect patient confidentiality. The form shall facilitate the preparation of a response, allow recording of the statistical data, and include the following elements:

a) professional background of requestor;[11]
b) classification of the request;

c) degree of urgency (in terms of when the answer is needed by the requestor);
d) information resources already consulted by the requestor;
e) additional background information obtained after the initial request was received;
f) date and time of the request; and
g) name of the person receiving the request.

Additional data may be appropriate, such as:

a) method by which the request was received (face to face, mail, telephone, or other auditory or electronic device);
b) category of request (patient-specific or general);
c) patient's current and past medications;
d) patient's clinical condition; and
e) patient's laboratory results.

12. PROVISION OF DRUG INFORMATION

The drug information pharmacist shall provide an accurate, complete, and timely response to requests for drug information using the modified systematic approach.

12.1 Timely Response

Responses shall be provided in a timely manner, with minimal delay, taking into consideration the complexity and urgency of the request.

The drug information pharmacist shall prioritize the request according to its urgency, in relation to other requests that must be addressed.

12.2 Design and Execution of Search Strategy

The drug information pharmacist shall design and execute a search strategy to respond to the request.

The drug information pharmacist may solicit the expertise and knowledge of other pharmacy practitioners and/or health care professionals as needed.

12.3 Evaluation and Use of Information

The drug information pharmacist shall evaluate and use the available information to formulate a response to the requestor.

12.4 Referencing of Comments and Statements

All comments and statements provided in the response shall be referenced and should be evidence-based.

12.5 Communicating the Response

The drug information pharmacist shall communicate the response to the requestor in a manner that best suits the urgency for and complexity of the drug information, regardless of the communication mode used for the original request.

When the response is provided verbally, the person providing the response should:

a) attempt to ensure that the recipient of the information has clearly understood what was communicated;[12] and
b) assess whether a written follow-up response is required.[12]

Complex responses should be provided in written format.[12] Requests for information to substantiate the response provided (such as full articles) should be accommodated, whenever possible.

12.6 Protecting Copyright

Copies of materials provided to the requestor shall protect the copyright held by the owner of the material. The drug information service should

consider having a licensing arrangement with a copyright clearance or licensing organization.

12.7 Disclaimer

All information provided by the drug information service shall include a disclaimer specifying that it is the best information from the resources available to the drug information service at the time the response was formulated.[12]

12.8 Documenting the Response

All requests, copies of references from the literature and other resources used in formulating responses, and the responses themselves, including the name of the drug information pharmacist who prepared the response, shall be documented using a standardized form or database.

The following information about the response should be recorded and stored with the request:

a) follow-up information obtained;
b) patient's outcome (when available);
c) date and time of request;
d) date and time of response; and
e) method used to communicate the response (verbal, written, or both) to the requestor.

Additional, optional data may be appropriate, such as:

a) time required to generate the response;
b) references and resources that the requestor consulted before contacting the drug information service; and
c) materials sent to the requestor if not mentioned within the response.

12.9 Supporting the Formulary System Committee

To support the hospital/regional formulary system committee in promoting safe, economical medication use, the drug information pharmacist shall:

a) critically appraise and evaluate the medical and pharmaceutical literature, in light of applicability to the hospital's patient population;
b) provide objective, complete reviews of drugs that may be considered for inclusion in the formulary to ensure safe, appropriate, and cost-effective drug use;
c) evaluate drug information provided either verbally or in writing by pharmaceutical representatives;
d) maintain, or assist in maintaining, an up-to-date formulary system of approved drugs and/or drug-use guidelines;
e) contribute to the review and revision of drug libraries, drug protocols, and alert systems used in technological tools (such as computerized prescriber order entry systems, pharmacy systems, bar-coding systems, smart infusion pumps); and
f) collaborate with individual practitioners who have clinical expertise within patient care areas related to the information being developed.

12.10 Providing Educational Support Services

To enhance the professional capabilities of health care providers in the medication-use process, drug information pharmacists shall:

a) provide evidence-based information on drug-related matters by preparing and making available newsletters, seminars, case studies, or workshops;
b) orient pharmacy staff to the appropriate drug information resources available to them;
c) educate undergraduate and graduate pharmacy students and residents about the drug information service; and

d) act as a preceptor to undergraduate and graduate pharmacy students when feasible.

13. INFORMATION MANAGEMENT

All documentation pertaining to the receipt of a request for drug information and the provision of drug information in response to such requests should be stored in a secure manner that permits timely retrieval by authorized personnel.

13.1 Filing of Requests and Completed Responses

Requests received and the completed responses shall be systematically filed for potential future use.

The filed response shall be assessed before it is reused, to determine if the information needs to be updated.

13.2 Filing System

The filing system used by the drug information service should be systematic, comprehensive, and current and should facilitate timely retrieval of individual drug information inquiries.

The method of indexing the information that is stored in the drug information files shall be based on a systematic method outlined in departmental policies. The American Hospital Formulary System therapeutic classification system[13] for numbering drugs, the International Classification of Diseases[14] for classifying diseases, and miscellaneous systems for clinical files that do not contain either a medication or disease within the title may be used to index paper and electronic drug files.

The inclusion and exclusion criteria for filing information shall depend on the scope of services offered and the type of storage system used.

Unnecessary duplication of information should be discouraged.

13.3 Retention of Records

Records shall be retained according to legislative requirements and the organization's policies and procedures and for a minimum of seven years after the document was created.

Note: *For records containing patient-identifying information, the reader is referred to the relevant provincial/territorial act(s) protecting health information.*

13.4 Culling of Records

The contents of the filing system should be reviewed periodically to ensure the timely removal of outdated records.

14. QUALITY MANAGEMENT

The quality of the drug information service shall be continuously evaluated and reported to assess whether the information provided has been useful and has assisted clients to optimize patient outcomes.

14.1 Assessing the Structure for Providing Drug Information Services

The structure of the drug information service shall be evaluated by reviewing the following:

a) adequacy of staffing levels;
b) effectiveness of organizational structure;
c) appropriateness of hours of service;
d) availability and use of resources;
e) suitability of premises; and
f) development and use of policies and procedures.

14.2 Assessing the Process of Providing Drug Information Services

The process for answering drug information questions shall be independently evaluated by randomly selecting, and auditing the documentation of requests, the references used, and the responses provided by the drug information pharmacist. The evaluation process shall assess the quality of the services provided and shall consist of the following elements:

a) periodic internal peer reviews; and
b) periodic surveys of clients to assess their satisfaction with the service.

Note*: The form "Audit of Responses to Requests for Drug Information", provided in Appendix B, may be used for such assessments.*

14.2.1 Following up to Provide Additional Information to the Requestor

If the audit reveals additional information that is relevant to the original drug information request, the drug information pharmacist shall communicate that information to the original requestor within a reasonable timeframe after the additional information comes to light.

14.3 Assessing the Outcome of the Drug Information Services

The outcome of the provision of drug information shall be evaluated by a client survey (written or by telephone) designed to identify the following:

a) client satisfaction with the timeliness and perceived quality of the response;
b) what was done with the information (such as change to an order or modification of a dose); and
c) impact of the information on patient outcome (such as cure of disease or improvement, resolution, or prevention of symptoms).

14.4 Reporting Performance

A report should be prepared periodically (at least annually) and submitted to the pharmacy management entity to whom the drug information service reports. The report shall facilitate the documentation, review, and reporting of the performance of the drug information service. It shall summarize the performance of the drug information service and should include the following elements:

a) project priorities;
b) summary of client assessments performed (see 14.3)
c) achievements, including a summary of:
    i) requests received;
    ii) workload; and
    iii) additional professional responsibilities
d) performance compared with the prior reporting period; and
e) unresolved issues that affect the performance of the drug information service.

14.5 Follow-up Action Plan

Pharmacy management and the drug information service shall develop an action plan to continuously improve the quality of the drug information service, in terms of its structure, process, and outcomes. The plan should be implemented and revised as needed to ensure that the service meets the drug information needs of the clients it serves.

15. LITERATURE CITED

1. Malone PM, Kier KL, Stanovich JE. *Drug information – a guide for pharmacists*. New York (NY): McGraw-Hill Companies Inc; 2006.

2. What is EBM? [Internet]. Toronto (ON): University Health Network, Centre for Evidence-Based Medicine; 2004 [cited 2008 Jul 8]. Available from: http://www.cebm.utoronto.ca/intro/whatis.htm

3. Host TR, Kirkwood CF. Computer-assisted instruction for responding to drug information requests [abstract]. 22nd American Society of Health-System Pharmacists Midyear Clinical Meeting; December 6–10, 1987; Atlanta (GA).

4. Identifying primary, secondary, and tertiary sources. Wilmington (NC): University of North Carolina Wilmington. Illiam Madison Randall Library; 2005 [cited 2009 Mar 16]. Available from: http://library.uncw.edu/web/research/topic/identifysources.html

5. Berknopf AC, Karpinksi JP, McKeever AL, Peak AS, Smith KM, Smith WD, et al. *Drug information practice and research network opinion paper: from paper to practice*. Lenexa (KS): American College of Clinical Pharmacy; 2008.

6. Standard 16: Drug information service. In: *Professional practice standards*. Version 3 [Internet]. Deakin West, ACT (Australia): Pharmaceutical Society of Australia; 2006 [cited 2008 Jul 3]. Available from: http://www.psa.org.au/site.php?id=843 (under "Standards", select "Professional Practice Standards", and then locate Standard 16).

7. Picton C. *A competency framework for medicine information* [Internet]. UK Medicines Information; 2001 [cited 2008 Jul 3]. Available from: http://www.ukmi.nhs.uk/filestore/ukmiamt/CompetencyFrameworkFinal.pdf

8. Professional Competency #2: Provide Drug Information. In: *Model standards of practice for Canadian pharmacists*. Ottawa (ON): National Association of Pharmacy Regulatory Authorities; 2003 [cited 2009 June 25]. Available from: http://napra.ca/pages/home/Resources.aspx?id=1903

9. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm* 1990;47(3):533-543.

10. American Society of Health-System Pharmacists. ASHP guidelines on the provision of medication information by pharmacists. *Am J Health Syst Pharm* 1996;53(15):1843-1845.

11. Watanabe AS, Conner CS. *Principles of drug information services – a syllabus of systematic concepts*. Hamilton (IL): The Hamilton Press Inc.; 1982.

12. Rochat C. Practice standard for the provision of drug information services [Internet]. Arcadia (South Africa): Pharmaceutical Society of South Africa, South African Association of Hospital and Institutional Pharmacists; 2007 [cited 2008 Jul 7]. Available from: http://www.saahip.org.za/docs/SAAHIP_DIC_practice_standard_2008.pdf

13. AHFS pharmacologic–therapeutic classification. Bethesda (MD): American Society of Health-System Pharmacists; 2008 [cited 2008 Sep 19]. Available from: http://www.ahfsdruginformation.com/docs/DI_tofc.pdf (accessible to ASHP members only).

14. International Classification of Diseases (ICD) [Internet]. Geneva (Switzerland): World Health Organization; [cited 2008 Jul 14]. Available from: http://www.who.int/classifications/icd/en/

16. ADDITIONAL RESOURCES

The following publications may assist the reader in implementing drug information practice as outlined in these guidelines:

ASHP Drug Information Series. Bethesda (MD): American Society of Health-System Pharmacists; 1995. Analyzing and recording a drug information request; Evaluating drug literature; Preparing a drug information response.

Dobbins RV, King CM Jr. Revised classification and filing system for hospital pharmacy. *Hosp Pharm* 1983;18(1):7-12, 17-19, 23-28, passim.

Thompson DF, Kaczmarek ER. Literature filing system for hospital pharmacy practice. *Am J Hosp Pharm* 1984;41(11):2392-2395.

APPENDIX A: LIST OF AUXILIARY DRUG INFORMATION RESOURCES

Recommended Resources

CSHP Category	Reference Name	Author/ Editor	Publisher
Adverse Drug Reactions	Meyler's Side Effects of Drugs	Aronson	Elsevier
Adverse Drug Reactions	Micromedex - Drug-Reax Systems		Thomson Reuters
Alternative Therapy	Micromedex - AltMedDex Systems		Thomson Reuters
Alternative Therapy	Natural Medicines Comprehensive Database	Jellin	Therapeutic Research Center
Alternative Therapy	Natural Standard		Natural Standard
Antimicrobial Therapy/Infectious Diseases	Canadian Immunization Guide	National Advisory Committee on Immunization	Public Health Agency of Canada
Antimicrobial Therapy/Infectious Diseases	The Sanford Guide to Antimicrobial Therapy	Gilbert, Moellering, Eliopoulos, Saag, Chambers	Antimicrobial Therapy Inc
Drug Identification	Canadian Investigational and Emergency Drug List	Wong	Canadian Society of Hospital Pharmacists
Drug Identification	The Merck Index: An Encyclopedia of Chemicals, Drugs and Biologicals	O'Neil	Merck
Drug Information Practice	Contemporary Drug Information: An Evidence Based Approach	Gaebelein	Lippincott Williams & Wilkins
Drug Information Practice	Drug Information: A Guide for Pharmacists	Malone	McGraw-HillMedical
Drug Information Practice	Drug Information: A Guide to Current Resources	Snow	Neal-Schuman
Drug Interactions	Facts and Comparisons - Drug Interaction Facts	Facts & Comparisons	Wolters Kluwer Health Inc
Drug Interactions	Hansten and Horn's Drug Interactions Analysis and Management	Hansten, Horn	Wolters Kluwer Health Inc
Drug Interactions	Stockley's Drug Interactions	Baxter	Pharmaceutical Press
Extemporaneous Formulations	Pharmaceutical Calculations	Zatz, Teixeriva	Wiley-Interscience
Extemporaneous Formulations	Trissel's Stability of Compounded Formulations	Trissel	American Pharmaceutical Association

Drug Information Services: Guidelines

CSHP Category	Reference Name	Author/ Editor	Publisher
General Medicine/Therapeutics	American Hospital Formulary Service: Drug Information	McEvoy	American Society of Health-System Pharmacists
General Medicine/Therapeutics	Annals of Pharmacotherapy (journal publication)		Harvey Whitney Books Company
General Medicine/Therapeutics	Compendium of Pharmaceuticals and Specialties (CPS)	Repchinsky	Canadian Pharmacists Association
General Medicine/Therapeutics	e-Therapeutics+ (includes e CPS, Lexi-Interact, Identification, Clin-Info)		Canadian Pharmacists Association
General Medicine/Therapeutics	Facts and Comparisons - Drug Facts and Comparisons	Facts & Comparisons	Wolters Kluwer Health Inc.
General Medicine/Therapeutics	Handbook of Drug Administration via Enteral Feeding Tubes	White, Bradnam	Pharmaceutical Press
General Medicine/Therapeutics	Hospital Pharmacy (journal publication)		Wolters Kluwer Health Inc
General Medicine/Therapeutics	Lexi-Comp Online (includes Lexi-Drugs, Lexi-Drugs International, Pediatric, Geriatric, Natural Products Database, Pharmacogenomics, Infectious Diseases, Lab Tests and Diagnostic Procedures without AHFS)		Lexi-Comp Inc
General Medicine/Therapeutics	Martindale: The Complete Drug Reference	Martindale	Pharmaceutical Press
General Medicine/Therapeutics	Micromedex - Drugdex		Thomson Reuters
General Medicine/Therapeutics	Pharmacotherapy (journal publication)		American College of Clinical Pharmacy
General Medicine/Therapeutics	Pharmacotherapy: A Pathophysiologic Approach	Dipiro, Tolbert, Yee, Matzke, Wells, Posey	McGraw-Hill Medical
Intravenous Therapy	Handbook on Injectable Drugs	Trissel	American Society of Health-System Pharmacists
Intravenous Therapy	King Guide to Parenteral Admixtures	Hudnell	King Guide Publications
Intravenous Therapy	Pediatric Injectable Drugs	Phelps	American Society of Health-System Pharmacists
Laboratory Medicine	Basic Skills in Interpreting Laboratory Data	Lee	American Society of Health-System Pharmacists

Drug Information Services: Guidelines

CSHP Category	Reference Name	Author/ Editor	Publisher
Miscellaneous	Remington: The Science and Practice of Pharmacy	Fox	Lippincott Williams & Wilkins
Pediatrics	BC Children's Hospital Pediatrics Drug Dosage Guidelines	Esau	British Columbia Children's Hospital
Pediatrics	Drug Handbook and Formulary	SickKids	The Graphic Centre, SickKids
Pediatrics	Formulary of Drugs and Dosing Manual	Drug Information	IWK Health Centre
Pediatrics	Neofax	Young, Mangum	Thomson Reuters
Pharmacokinetics	Applied Pharmacokinetics	Evans, Schentag, Jusko	Applied Therapeutics Inc
Pharmacokinetics	Drug Prescribing in Renal Failure: Dosing Guidelines for Adults	Aronoff, Berns, Brier, Swan, Golper, Morrison, Singer, Bennett	American College of Physicians
Pharmacology	Goodman and Gilman's The Pharmacological Basis of Therapeutics	Brunton, Lazo, Parker	McGraw-Hill Medical
Pregnancy and Lactation	Drugs in Pregnancy and Lactation	Briggs, Freeman, Yaffe	Wolters Kluwer Health Inc
Pregnancy and Lactation	Medication and Mothers' Milk	Hale	Hale Publishing
Professional Practice	American Journal of Health-System Pharmacy (journal publication)		American Society of Health-System Pharmacists
Professional Practice	Canadian Journal of Hospital Pharmacy (journal publication)		Canadian Society of Hospital Pharmacists
Professional Practice	Canadian Pharmaceutical Journal (journal publication)		Canadian Pharmacists Association
Professional Practice	US Pharmacist		Jobson Medical Information
Psychiatry	Clinical Handbook of Psychotropic Drugs	Virani	Hogrefe & Huber Publishers
Secondary source of information	Medline		Wolters Kluwer Health Inc
Secondary source of information	PubMed		U.S. National Library of Medicine and the National Institutes of Health

Drug Information Services: Guidelines

Suggested Resources

CSHP Category	Reference Name	Author/Editor	Publisher
Adverse Drug Reactions	Reactions Weekly (journal publication)		Adis
Alternative Therapy	Drug Information Handbook w/Int'l Trade Names Index	Lacy	Lexi-Comp
Alternative Therapy	Facts and Comparisons - Review of Natural Products	DerMarderosian, Beutler	Wolters Kluwer Health Inc
Antimicrobial Therapy/Infectious Diseases	Bugs and Drugs	Blondel-Hill, Fryters	Capital Health Edmonton
Critical Care	Anesthesiology & Critical Care Drug Handbook	Donnelly, Baughman, Gonzales, Golembiewski, Tomsik	Lexi-Comp
Critical Care	Essentials of Critical Care Pharmacology	Chernow	Lippincott Williams & Wilkins
Drug Interactions	The Top 100 Drug Interactions: A Guide to Patient Management	Hansten, Horn	H&H Publications, LLP
Extemporaneous Formulations	International Journal of Pharmaceutical Compounding (journal publication)		IJPC
Extemporaneous Formulations	Allen's Compounded Formulations	Allen	American Pharmaceutical Association
Extemporaneous Formulations	ASHP Guideline on Pharmacy Prepared Ophthalmic Products		American Society of Health-System Pharmacists
Extemporaneous Formulations	Extended Stability for Parenteral Drugs	Bing	American Society of Health-System Pharmacists
Extemporaneous Formulations	Handbook of Pharmaceutical Excipients	Rowe, Sheskey, Owen	Pharmaceutical Press
Extemporaneous Formulations	Pharmacy Compounding Manual	ACH	Alberta Health Services
General Medicine/Therapeutics	CNS Drugs (journal publication)		Adis
General Medicine/Therapeutics	Drug Safety (journal publication)		Adis
General Medicine/Therapeutics	Drugs (journal publication)		Adis

Drug Information Services: Guidelines

CSHP Category	Reference Name	Author/Editor	Publisher
General Medicine/Therapeutics	Drugs & Aging (journal publication)		Adis
General Medicine/Therapeutics	Drugs and Therapy Perspectives (journal publication)		Adis
General Medicine/Therapeutics	Applied Therapeutics: The Clinical Use of Drugs	Koda-Kimble, Young, Alldredge, Corelli, Guglielmo, Kradjan, Williams	Wolters Kluwer Health Inc.
General Medicine/Therapeutics	Harrison's Principles of Internal Medicine	Braunwald, Fauci, Kasper, Longo, Hauser, Jameson, Loscalzo	McGraw-Hill Medical
General Medicine/Therapeutics	Medical Letter on Drugs and Therapeutics	The Medical Letter	The Medical Letter Inc
General Medicine/Therapeutics	Ophthalmic Drug Facts	Bartlett, Fiscella, Bennett, Jaanus, Rowsey, Zimmerman	Wolters Kluwer Health Inc
General Medicine/Therapeutics	Pharmacogenomics Handbook	Cavallari, Ellingrad, Kolesar	Lexi-Comp
General Medicine/Therapeutics	RxFiles - Drug Comparison Charts	Jensen, Regier	Saskatoon City Hospital
General Medicine/Therapeutics	The Merck Manual of Diagnosis and Therapy	Beers	Merck Research Laboratories
General Medicine/Therapeutics	Therapeutic Choices	Gray	Canadian Pharmacists Association
Geriatrics	Geriatric Dosage Handbook	Semla, Beizer, Higbee	Lexi-Comp
Intravenous Therapy	Intravenous Medications	Gahart, Nazareno	Mosby
Intravenous Therapy	Parenteral Drug Therapy Manual (from another institution)		
Non-prescription Medications	Patient Self Care	CPhA	Canadian Pharmacists Association
Oncology	Care Beyond Cure: Management of Pain and other Symptoms	Neron	APÉS
Pediatrics	Pediatric Drugs (journal publication)		Adis
Pediatrics	Johns Hopkins: The Harriet Lane Handbook	Custer, Rau	Mosby
Pediatrics	Pediatric Dosage Handbook	Taketoma	Lexi-Comp
Pharmacokinetics	Clinical Pharmacokinetics		Adis

CSHP Category	Reference Name	Author/Editor	Publisher
	(journal publication)		
Pharmacology	Basic and Clinical Pharmacology	Katung	McGraw-Hill Medical
Psychiatry	Clinical Handbook of Psychotropic Drugs for Children and Adolescents	Bezchlibnyk-Butler, Virani	Hogrefe & Huber Publishers
Psychiatry	Essential Psychopharmacology	Stahl	Cambridge University Press
Secondary source of information	Embase		Wolters Kluwer Health Inc
Secondary source of information	International Pharmaceutical Abstracts		Wolters Kluwer Health Inc
Toxicology source of information	Poison Management Manual	Kent, Willis	BC Drug and Poison Information Centre

Optional Resources

CSHP Category	Reference Name	Author/Editor	Publisher
Intravenous Therapy	Parenteral Drug Therapy Manual		Mississauga Hospital
Intravenous Therapy	Parenteral Drug Therapy Manual	Bédard, Massicotte, Prasad	Ottawa General Hospital
Intravenous Therapy	Parenteral Drug Therapy Manual		Vancouver Costal Health

APPENDIX B: AUDIT OF RESPONSES TO REQUESTS FOR DRUG INFORMATION

Permission was obtained from Dr. C. Dillon, Assistant Professor, to adapt the audit tool prepared by Memorial University of Newfoundland, School of Pharmacy.

Selection of requests to be reviewed:

Inclusion:

- Audit a random selection of predetermined number of samples
- Pharmacy student involved with request: these requests will be included and student involvement should be noted.

Exclusion:

- Requests for article retrieval
- Reference resource questions (i.e. where to obtain a particular reference?)

Areas of Evaluation:

I. *Demographic data completeness:*

a. Requestor name
b. Requestor location including city
c. Requestor contact information
d. Requestor's profession
e. Date and time
f. Who received the request
g. How the request was received
h. Timeframe in which a reply is needed
g. Origin of request

1 (poor) = No demographic data was elicited.
2 (fair) = 50% of demographic data was elicited.
3 (good) = 75% of demographic data was elicited.
4 (excellent) = Complete demographic data was provided.
NA = Not able to assess from documentation available
Comments:

II. *Appropriateness of background information*:

1 (poor) = No background information was elicited.
2 (fair) = 50% of background information was elicited.
3 (good) = 75% of background information was elicited.
4 (excellent) = Complete background information was provided.
NA = Not able to assess from documentation available
Comments:

Drug Information Services: Guidelines

IIa. *Classification of request*
Was the request classified?
☐ Yes ☐ No
If yes, what classification was it given?

Evaluator agrees with the classification:
☐ Yes
☐ No
☐ Partially (i.e. additional categories also appropriate)

III. *Ultimate question* **(NAPRA competency 2.1):**
Clear: it is evident what was searched?
☐ Yes ☐ No
Comments:

IV. *Documentation of references used:*
All references used are documented:
☐ Yes ☐ No
NA = Not able to assess from documentation available
Comments:

V. *Appropriateness of references used*(NAPRA competency 2.1):
The rating system is based on the following conditions:

a. Reviewed at least two appropriate tertiary sources.
b. Reviewed at least two appropriate secondary sources, if necessary based on performance standards.
c. Retrieved the primary literature, if necessary.

1 (poor) = None of the conditions were met.
2 (fair) = One of the conditions was met.
3 (good) = Two conditions were met.
4 (excellent) = All necessary resources were reviewed.
NA = Not able to assess from documentation available
Comments:

VI. *Completeness of the search* (NAPRA competency 2.2):
The search was sufficiently comprehensive so that all relevant issues pertaining to the request were addressed.

1 (poor) = No search was done.
2 (fair) = 50% of evaluator's reference choices were used.
3 (good) = 75% of evaluator's reference choices were used.
4 (excellent) = A complete search was done.
NA = Not able to assess from documentation available
Comments:

VII. *Accuracy (NAPRA competency 2.3):*
An accurate response is one that contains an appropriate interpretation of the data that is applicable to the patient situation at hand, that is specific to the request, and that is complete.

1 (poor) = Inaccurate – complete revision needed. Response contains a categorical statement that is incorrect.
2 (fair) = Minor discrepancies; two or more deficiencies. Response contains information that appears to be established but is not.
3 (good) = Minor discrepancies; one deficiency.
4 (excellent) = Accurate response.
NA = Not able to assess from documentation available
Comments:

VIII. *Literature evaluation (NAPRA competency 2.3):*
Major attributes or deficiencies of the references used are indicated (i.e., study methods, etc.)

1 (poor) = Complete revision is required to become acceptable.
2 (fair) = Three or more minor deficiencies exist and require correction.
3 (good) = One or two minor deficiencies exist and require correction.
4 (excellent) = No changes are required.
NA = Not able to assess from documentation available
Comments:

Drug Information Services: Guidelines

IX. *Objectivity (NAPRA competency 2.3):*
Response was unbiased and based on the literature evaluated. Controversial points are addressed describing both sides.
Opinions are clearly separated from factual information.
☐ Yes ☐ No
NA = Not able to assess from documentation available
Comments:

X. *Conclusions (NAPRA competency 2.3):*
Logical, reasonable conclusions based on information given. The responder synthesized and evaluated (not merely summarized) the data from various sources to form a logical and coherent conclusion.

1 (poor) = Complete revision is required to become acceptable.
2 (fair) = Three or more minor deficiencies exist and require correction.
3 (good) = One or two minor deficiencies exist and require correction.
4 (excellent) = No changes are required.
NA = Not able to assess from documentation available
Comments:

XI. *Organization/Clarity (written [NAPRA competency 2.4]):*
Response follows a logical sequence, addressing all major points in an organized fashion.

1 (poor) = Complete revision is required to become acceptable.
2 (fair) = Three or more minor deficiencies exist and require correction.
3 (good) = One or two minor deficiencies exist and require correction.
4 (excellent) = No changes are required.
NA = Not able to assess from documentation available
Comments:

XII. *Terminology (written [NAPRA competency 2.4]):*
Answer clearly presented using appropriate terminology.

1 (poor) = Complete revision is required to become acceptable.
2 (fair) = Three or more minor deficiencies exist and require correction.
3 (good) = One or two minor deficiencies exist and require correction.
4 (excellent) = No changes are required.
NA = Not able to assess from documentation available
Comments:

Drug Information Services: Guidelines

XIII. *Referencing (written):*

All statements were referenced appropriately.

☐ Yes ☐ No

NA = Not able to assess from documentation available

Comments:

XIV: *Timeliness (NAPRA competencies 2.2 & 2.4):*

A timely response is one that is provided within 24 hours or within the time interval specified by the requestor. If a complete response could not be provided within this timeframe, preliminary information was provided within the time frame, with follow-up when all data was gathered.

☐ Yes ☐ No

NA = Not able to assess from documentation available

Comments:

XV: *Question difficulty rank:*

1 = not difficult; a straightforward request.
2 = required some interpretation of the retrieved data.
3 = required extensive search and interpretation of data.
4 = required an extensive search and extensive integration and interpretation of the data.
Comments:

XVI: Potential clinical impact:

-1 (adverse significance) = Intervention detrimental to patient's well being
0 (no significance) = Information only. No potential for medical harm. Intervention of no significance to patient care.
1 (somewhat significant) = Any chance of unnoticed effect or <5% chance of noticed effect. Intervention significant but does not lead to improved patient care.
2 (significant) = >5% chance of noticed effect. Intervention significant and leads to improved patient care.
3 (very significant) = Intervention highly significant and prevents major organ failure or adverse reaction of similar importance.
4 (extremely significant) = >20% chance of noticed effect or >5% chance of harmful effect or any chance of lethal effect. Intervention is potentially life saving.
NA = Not able to assess from documentation available or not applicable.
Comments:

Additional Comments:

Evaluator:_____ Signature:_____
Date:_____

Bibliography:

Evens RP, Shahan DR, Littlefield JH. Evaluating performance in writing drug information consultations. *Am J Hosp Pharm*. 1982 May;39(5):810-4.

Hands D, Stephens M, Brown D. A systematic review of the clinical and economic impact of drug information services on patient outcome. *Pharm World Sci*. 2002 Aug;24(4):132-8.

Johnson N, Dupuis LL. A quality assurance audit of a drug information service. *Can J Hosp Pharm*. 1989 Apr;42(2):57-61.

NAPRA (National Association of Pharmacy Regulatory Authorities) Model Standards of Practice for Canadian Pharmacists - April 2003 http://www.napra.org/docs/0/95.asp Accessed April 11, 2007.

Restino MS, Knodel LC. Drug information quality assurance program used to appraise students' performance. *Am J Hosp Pharm*. 1992 Jun;49(6):1425-9.

Rosenberg JM, Koumis T, Nathan JP, Cicero LA, McGuire H. Current status of pharmacist-operated drug information centers in the United States. *Am J Health Syst Pharm*. 2004 Oct 1;61(19):2023-32.

Smith CJ, Sylvia LM. External quality assurance committee for drug information services. *Am J Hosp Pharm*. 1990 Apr;47(4):787-91.

Wheeler-Usher DH, Hermann FF, Wanke LA. Problems encountered in using written criteria to assess drug information responses. *Am J Hosp Pharm*. 1990 Apr;47(4):795-7.