Assessment of the Use of a Regional Drug Information Service by Community Pharmacists

Sharon J. Fisher, Todd D. Sorensen and C. Brian Tuttle

ABSTRACT

Community pharmacy inquiries received by the Regional Drug Information Service (RDIS) affiliated with the Queen Elizabeth II Health Sciences Centre Drug Information Centre almost tripled between 1990 and 1995, placing significant pressure on staff and resources. A study was undertaken to determine whether the service was being used appropriately by this population. Inappropriate use was measured by identifying requests considered to be beyond the focus of RDIS, as well as those that could have been answered by the requesting practitioner using references expected to be found in a community pharmacy. Of 444 inquiries received during the study period, 56 were identified as inappropriate. Twelve requests did not pertain to drugs or pharmacotherapeutics, while the remaining 44 could have been answered using references from a core library. A survey of community pharmacies from which an inappropriate inquiry originated revealed that only 2 of these requests came from a pharmacy lacking the necessary core reference. This study indicates that the majority of inquiries received by RDIS from community pharmacists cannot be adequately answered using a core library alone; thus, inappropriate inquiries do not contribute substantially to the growing workload of RDIS.

Key Words: Community Pharmacy, Drug Information, Drug Information Service

RÉSUMÉ

Les demandes de renseignement des pharmacies communautaires qui sont adressées au Service d'information régional sur les médicaments (RDIS) affilié au Centre d'information sur les médicaments du Queen Elizabeth II Health Sciences Center, ont presque triplé entre 1990 et 1995, ce qui a mis beaucoup de pression sur le personnel et les ressources de ce centre. Une étude a été menée pour déterminer si oui ou non les services de ce centre étaient utilisés à bon escient par ces clients. L'usage inopportun du centre a été mesuré en identifiant les demandes qui dépassaient les compétences du RDIS et celles auxquelles aurait pu répondre le médecin demandant s'il avait utilisé les ouvrages de référence qu'on trouve habituellement dans une pharmacie communautaire. Des 444 demandes reçues au cours de la période de l'étude, 56 ont été identifiées comme inopportunes. De ces dernières, douze n'avaient aucun rapport avec les médicaments ou la pharmacothérapie, alors que les 44 autres auraient pu trouver réponse si les demandeurs avaient consulté les ouvrages de référence de la bibliothèque «centrale». Un sondage mené auprès des pharmacies communautaires qui ont fait des demandes inopportunes a révélé que seulement deux de ces demandes provenaient d'un pharmacien qui n'avait pas accès à l'ouvrage de référence central nécessaire pour trouver la réponse. Cette étude indique que la plupart des demandes adressées par les pharmacies communautaires au RDIS ne peuvent pas trouver de réponse satisfaisante en n'ayant recours qu'aux ouvrages de référence d'une bibliothèque centrale. Par conséquent, les demandes inopportunes ne contribuent pas notablement à la charge de travail croissante du RDIS.

Mots clés : information sur les médicaments, pharmacie communautaire, service d'information sur les médicaments.

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INTRODUCTION

The ability to access and provide accurate, up-to-date and unbiased drug information is a skill required by all pharmacists. In many cases, drug information needs may be met by the practitioner with or without the use of available references;[1] however, some situations require a greater degree of research and/or use of resources to which access may be limited. In these situations, formal drug information services are an invaluable tool to pharmacy practitioners.

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The Regional Drug Information Service (RDIS) affiliated with the Queen Elizabeth II Health Sciences Centre Drug Information Centre (QEII HSC-DIC) in Halifax, Nova Scotia, is one of 10 regional drug information services in Canada. The mission of RDIS is to provide accurate, up-to-date information concerning drugs and therapeutics to all health care professionals in Nova Scotia, as well as to all pharmacists practising in New Brunswick and Prince Edward Island. It is a consultative, referral service, intended to provide support to local services when requirements for drug information exceed the capabilities of local resources.

Staffing of the QEII HSC-DIC currently includes 3.5 FTE drug information pharmacists and 1.0 FTE secretary. In addition to responding to both internal and external drug information inquiries, staff responsibilities include maintenance of the QEII HSC-DIC library, preparation of publications, database development, institutional committees, and pharmacy student and pharmacy resident education.

Drug information inquiries directed to RDIS currently represent approximately 88% of the total QEII HSC-DIC workload. Referrals to RDIS have increased considerably since 1990 when services were extended to New Brunswick and Prince Edward Island (Figure 1). Pharmacy represents the largest source of inquiries, with the majority coming from pharmacists practising in the community setting. Community pharmacist utilization also represents the highest annual growth, averaging 20.5% since 1991. As illustrated in Figure 1, the number of calls received from this group almost tripled between 1990 and 1995. In contrast, institutional pharmacy utilization has remained stable. This increase in drug information inquiries translates into a growing workload for RDIS staff and may negatively impact on the level of service provided unless additional resources are made available.

However, before consideration can be given to adding new resources to RDIS, the possibility of inappropriate utilization must be considered. If considerable misuse of the service were identified, steps could be taken to eliminate this problem.

A review of the literature[1-3] and the current usage pattern of RDIS support the need to assess the appropriateness of the use of this regional drug information service by community pharmacists. Therefore, the primary objective of this project was to determine whether RDIS was being used appropriately by community pharmacists. If inappropriate use was identified, secondary objectives were to determine whether the degree of inappropriate use was different between provinces and whether a lack of on-site drug information references was a contributing factor.

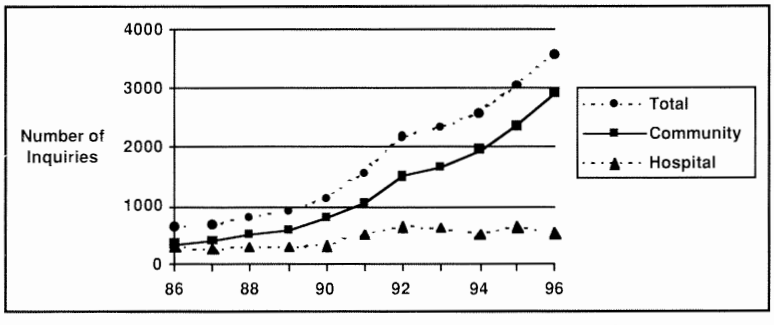

Figure 1: Inquiries Received by Regional Drug Information Service

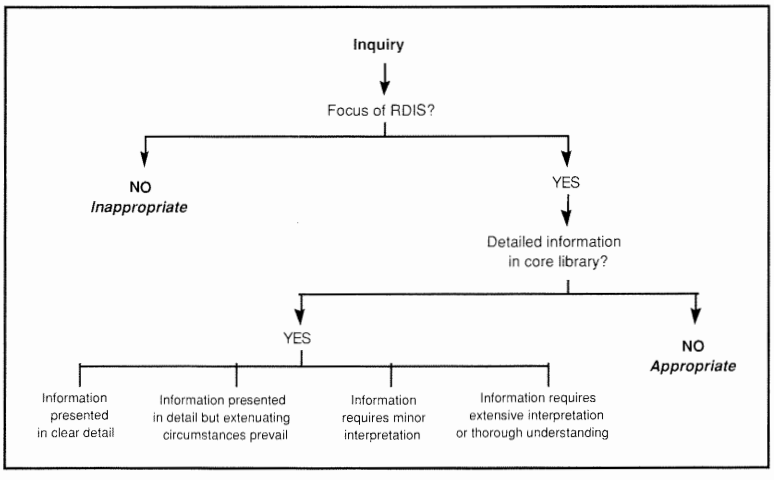

Figure 2: Categorization of Appropriate and Inappropriate Inquiries

METHODS

All requests received by RDIS from community pharmacists during the 8-week period of January 4 to February 29, 1996 were targeted for assessment. Inquiries were evaluated and categorized as appropriate or inappropriate according to a decision algorithm developed by the investigators (Figure 2). Some basic assumptions and expectations were established which served as the basis for the assessment of each inquiry. These included: 1) all inquiries were considered appropriate unless categorized otherwise; 2) all pharmacists practising in the community setting have equal access to a core library at their practice site; 3) all pharmacists should consult their own library for a solution prior to contacting RDIS; and 4) all callers have equal ability to obtain, interpret, and evaluate drug information.

A list of references representing a typical community pharmacy library (hereafter core

library) was developed (Table I) based upon the latest minimum library requirements outlined by the respective pharmacy licensing bodies of Nova Scotia, New Brunswick, and Prince Edward Island.

A modified drug information request documentation form was used by drug information staff during the study. Additional information which was recorded for this study included: 1) resources previously checked by the caller; and 2) any noteworthy circumstances regarding the reason for the inquiry. Each completed request was analysed by the principal investigator and any details were clarified with RDIS staff if needed.

Each request was assessed by the principal investigator (SF) using the decision algorithm (Figure 2). Requests were first screened to ensure that they related to drugs and/or pharmacotherapeutics. Requests not meeting this criteria (i.e., "non-focus" inquiries) were considered inappropriate. References included in the core library were consulted in order to determine which of the remaining inquiries could have been answered by referring to these references. Where the core library permits a choice of references, the same information must have been documented in each text. For example, the answer to a request found in USP-DI - Volume I (Drug Information for the Health Care Professional) must also be found in American Hospital Formulary Service - Drug Information as well as in Drug Facts and Comparisons in order for the solution to be considered available in the core library.

Table I. Core Library for a Community Pharmacy

A. Canadian Prescription and Non-Prescription Drug References - *Current

1. CPS: Compendium of Pharmaceuticals and Specialties
2. Self Medication (Volume I)

and one of

3. Self Medication (Volume II) **OR**
4. CNP: Compendium of Nonprescription Products

B. Drug Information Reference(s) - *Recent* †

1. Martindale: The Extra Pharmacopoeia

and one of

2. USP DI, Volume 1 - Drug Information for the Health Care Professional
3. American Hospital Formulary Service Drug Information (AHFS - DI)
4. Drug Facts and Comparisons

C. Drug Interaction Reference - *Current

1. Drug Interactions & Updates (Hansten and Horn) **OR**
2. Drug Interaction Facts (Facts & Comparisons)

D. Patient Counselling Reference

1. USP DI, Volume 2 - Advice for the Patient - *Recent* † **OR**
2. Medication Teaching Manual (ASHP) - *Current**

E. Pharmaceutics Reference - *Recent* †

1. Remington's Pharmaceutical Sciences

F. Pregnancy/Lactation Drug Reference - *Current*

1. Drugs in Pregnancy and Lactation (Briggs)

***Current** refers to the latest edition
†***Recent*** refers to either the latest edition or to the edition immediately preceding the latest edition

Inquiries which required detailed information but which were not documented in the core library were considered appropriate. The remaining inquiries were further categorized into 1 of 4 groups based on the ease with which the response could be found in the core library. The first group consisted of inquiries for which the response was clearly stated or explained in a single text (i.e., information presented in clear detail) and were rated as inappropriate. A second group (i.e., information presented in clear detail but extenuating circumstances prevail) comprised those inquiries where the answer was clearly stated in a text, but the requester needed reassurance or a second opinion. These were rated as appropriate. The third category consisted of inquiries for which either referral to more than 1 reference or minor interpretation of the information available was required (i.e., information requires minor interpretation). Requests in this category were considered inappropriate. The final category included inquiries which required extensive interpretation of the information available or a thorough understanding of the subject matter (i.e., information requires extensive interpretation or thorough understanding) and were considered appropriate requests. Table II provides examples of these 4 categories.

Pharmacies identified as the source of an inappropriate request (excluding "non-focus" inquiries) were targeted for a telephone survey designed to determine if core references providing the desired information were actually available on site at the time of the request. In instances where the survey could not be conducted at the time of the initial call, a "call-back" time was determined or the survey was transmitted by fax.

RESULTS

Four hundred and forty-four inquiries were received from community pharmacists during the study period. Fifty-six (12.6%) were categorized as inappropriate. Requests regarding product identification or availability, adverse drug reactions and dosage accounted for over

Table II. Examples of Inquiry Categorization

1. Information Presented in Clear Detail:

Inquiry: Can clarithromycin be substituted for erythromycin when the concern of a drug interaction with cisapride exists?

Detail: Drug interaction between clarithromycin and cisapride is published in each of the drug information references listed in Table I.

Categorization: Inappropriate

2. Information Presented in Detail but Extenuating Circumstances Prevail:

Inquiry: Can ciprofloxacin be used safely in children under the age of 16?

Circumstances: After informing a prescriber about the need for precaution with ciprofloxacin in children younger than 18 years, the caller was told by the physician that this was no longer an issue. The pharmacist wanted to confirm his understanding of the precautionary statement in the Compendium of Pharmaceuticals and Specialties.

Categorization: Appropriate

3. Information Requires Minor Interpretation:

Inquiry: Is there a potential for cross-sensitivity to glyburide in patients allergic to sulfa drugs?

Interpretation: The potential is clearly documented; however, significance depends on the type of reaction to sulfa (i.e., true allergy?).

Categorization: Inappropriate

4. Information Requires Extensive Interpretation or Thorough Understanding:

Inquiry: Can a tri-cyclic antidepressant such as amitriptyline be used in combination with an SSRI such as fluoxetine?

Interpretation: The potential for interaction is clearly documented; however comments regarding precautions to take if used together are also presented. Clear understanding of information may depend on clinical experience with the medications.

Categorization: Appropriate

Table III. Nature of Inquiries Received from Community Pharmacists

Category of Request	Total Requests n = 444	Inappropriate Requests		
		Number n = 56	% of Total Inappropriate Requests	% of Category
Product ID/Availability	84	17	30.4	20.2
Adverse Reaction/Toxicity	82	8	14.3	9.8
Therapeutics	67	3	5.4	4.5
Herbal Products	53	0	0	0
Drug Interactions	52	4	7.1	7.5
Dosage	26	7	12.5	26.9
Drugs in Pregnancy/Lactation	19	2	3.6	10.5
Product Monograph	8	0	0	0
Stability/Compatibility	7	0	0	0
Copy of an Article	7	0	0	0
Administration	6	0	0	0
Patient Information	3	0	0	0
Pharmacology	6	0	0	0
Product Formulation	4	2	3.6	50
Pharmaceutics	4	1	1.8	25
Other	4	0	0	0
"Non-Focus"	12	12	21.4	100

50% of the inappropriate inquiries (Table III). No statistically significant differences (Chi-square test, $p < 0.05$) were found among the 3 Maritime provinces with respect to inappropriate inquiries whether or not non-focus inquiries were included (Table IV).

The rating of inquiries according to the decision algorithm illustrated in Figure 2 revealed that in 32 cases the information was presented in clear detail. Twelve inquiries were identified as "non-focus" and included requests for information concerning disease states (4), diagnostic procedures (2), diet (2), laboratory values (2), non-drug commercial product formulation (1), and acute chemical intoxication (1). Both of these were deemed inappropriate.

Thirteen inquiries which were initially considered inappropriate were classified as appropriate (i.e., extenuating circumstances prevail); these situations included: 1) requests for reassurance and/or a second opinion; 2) conflicting professional opinions concerning the issue in question; and 3) incomplete or inaccurate details provided to the pharmacist who subsequently made the inquiry (e.g., misspelling of a product to be identified). Thirty-eight inquiries where deemed to require extensive interpretation or a thorough understanding. These latter 2 categories were deemed appropriate.

Forty-four inappropriate inquiries (excluding the "non-focus" type) originated from 40 community pharmacies. The contents of the libraries were successfully obtained for 37 pharmacies. In 34 cases, the pharmacist placing the request had at least 1 reference containing the desired information on site (Figure 3). In 29 cases, this reference was the Compendium of Pharmaceuticals and Specialties.

DISCUSSION

The increasing demand for drug information is not a problem unique to RDIS and represents a challenge faced by many established drug information centres.[1,4,5] Identification of factors contributing to the increased demand may help determine the most logical means of addressing the resulting increase in workload.

Many studies have dealt with evaluating the quality of services provided by drug

Table IV. Summary of "Appropriate" and "Inappropriate" Requests

Category	Nova Scotia (%)	New Brunswick (%)	Prince Edward Island (%)	Total (%)
Total	255	160	29	444
Appropriate	226 (88.6)	139 (86.9)	23 (79.3)	388 (87.4)
Inappropriate	29 (11.4)[a]	21 (13.1)[a]	6 (20.7)[a]	56 (12.6)
Total[b]	250	156	26	432
Inappropriate	24 (9.6)[c]	17 (10.9)[c]	3 (11.5)[c]	44 (10.2)

[a] Indicates percentage of total inquiries (p = NS)
[b] Represents total requests, excluding "non-focus" type
[c] Indicates percentage of total inquiries, excluding "non-focus" type (p = NS-Not Significant)

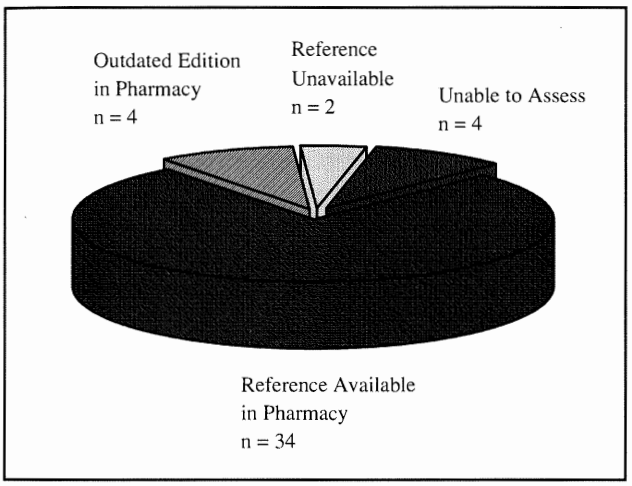

Figure 3: Access to Core Library References in Pharmacies Submitting Inappropriate Inquiries

information centres;[6-8] however, very little work has focused on the appropriate use of these services. In 1977, the Drug Information Service at the University of Connecticut Health Centre demonstrated that of 750 requests received, only 15% required the use of references not believed to be readily available to the community pharmacist.[1] These findings suggested that the services provided were being used inefficiently. In another study, investigators attempted to determine whether inquiries that could have been answered by the "average pharmacist" were being directed to a drug information centre.[3] Unfortunately, problems arising with the design of the study made it impossible to determine the extent to which this occurred. The goal of this project was to determine whether the service provided by RDIS is being used appropriately by community pharmacists, the largest user group.

Seventy-six percent of the 444 requests received were considered appropriate because they could not be answered by using the core library alone. An additional 8.6% were rated as appropriate despite documentation of the relevant information in the core library since extensive interpretation, thorough understanding of the subject matter, or reassurance were required in order to reach a satisfactory solution to the problem. Many of these situations represent cases in which an answer may be derived by combining information found in multiple drug information references. While this could have been accomplished by community pharmacists using the core library, we concluded that drug information requests requiring considerable piecing together of information warranted the support of RDIS, as drug information pharmacists have developed considerable skill in this area.

When evaluating the results of this study, bias must be a consideration and it can be argued that the principal investigator could not be totally objective in the rating of drug information requests. While considerable effort was taken to adopt clear, objective, assessment criteria, some subjective assessments were inevitable in the assessment of extenuating circumstances (Figure 2). A potential method of reducing this bias would have been to employ an external review panel to make these assessments but this was felt not to be feasible for our study. Another potential limitation of our study was that an inquiry was considered to be appropriate if the pharmacist was seeking reassurance or another opinion. Given the small number of inquires that met this criteria (n=13) even if these were to be considered inappropriate it is unlikely that this would meaningfully affect our results.

As well, the number of inappropriate calls may be somewhat lower than expected due to the fact that the core library did not include a pharmacy therapeutics text (e.g., *Pharmacotherapy, Applied Therapeutics*). Fifteen percent of all inquiries were categorized as pertaining to drug therapeutics and only 3 of these were considered inappropriately directed to RDIS. A therapeutics text was not included in the core library because one is not required by 2 of the 3 Maritime pharmacy licensing bodies. Requiring such a text may have increased the number of inquiries determined to be inappropriate and may also represent 1 reason why the results from this study are dissimilar to previous assessments.

Of the 56 inappropriate requests identified, 12 related to issues other than drugs and/or therapeutics (i.e., "non-focus" inquiries). While these represent valid information needs of the community pharmacist and cannot be answered by using the core library, the topics do not fall within the role of RDIS. Potential sources for the type of information included in this category were the product manufacturer, a

poison control centre, pharmacy faculty, medical practitioners, and dietitians.

Inadequate drug information libraries have been identified by community pharmacists as a limiting factor in the provision of drug information services.[5] Since the identification of inappropriate inquiries was based almost exclusively on the ability to find the response in the core library, we wished to determine whether a core library reference providing the answer was available at the practice site. In the vast majority of cases, inappropriate inquiries came from a pharmacy which had on-site access to the required reference at the time the request was made.

This analysis seems to indicate that a lack of drug information resources was not a factor contributing to inappropriate drug information inquiries since 92% had these references available. However, the assessment of appropriate use of formal drug information services should not be based solely on whether the information requested is documented in references readily available to pharmacists at their practice site. Proper assessment should also determine the effort made by pharmacists to find the answer prior to contacting the service. An attempt was made to capture this; however, due to inconsistent documentation, it was not possible to use this information to assess the appropriateness of inquiries. Yet, in at least 57% of cases, pharmacists consulted one or more resources prior to contacting RDIS. Examples of such resources included library references, fellow pharmacists, health food stores, manufacturers and wholesalers.

Even those inappropriate questions were unlikely to contribute substantially to the RDIS workload. While an accurate assessment of the impact of these inquiries on workload was not undertaken during this study, a review of the nature of these requests provides some insight. The majority of inappropriate inquiries concerned product identification, and could have been easily solved by referring to a single core reference (often the Compendium of Pharmaceuticals and Specialties). The RDIS staff would have responded to these calls within a matter of a few minutes. Furthermore, it is likely that requests requiring minor interpretation would take less time and effort to answer compared to the average "appropriate" inquiry which may require extensive interpretation of the literature. The time and effort required to respond to a particular request will depend on the nature of the desired information, and not necessarily whether it is considered appropriate or inappropriate. Further investigation into this area may be worthwhile in order to determine the true impact of inappropriate inquiries on the workload of RDIS.

In conclusion, this study suggests that the majority of inquiries received by RDIS from community pharmacists cannot be answered solely by referring to references expected to be available in this setting. It can also be concluded that the majority of inappropriate inquiries were directed to RDIS not because of a lack of resources, but instead, due to a failure to effectively utilize references readily available on site. Thus, this study emphasizes the importance of developing pharmacists' ability to extract, interpret, and evaluate drug information.

During the study period, inappropriate inquiries did not represent an appreciable portion of total requests and are unlikely to account for the increasing utilization of RDIS by community pharmacists. This suggests that the increasing demand for services provided by RDIS may truly be a reflection of an increasing need for the service in the community.

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