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FOR TECHNICIANS**

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Instructions

1. After carefully reading this lesson, study each question and select the one answer you believe to be correct. Circle the appropriate letter on the attached reply card.
2. Complete the card and mail, or fax Mayra Ramos at (416) 764-3937.
3. Your reply card will be marked and you will be advised of your results in a letter from *Tech Talk*.
4. To pass this lesson, a grade of 70% (7 out of 10) is required. If you pass, you will receive 1 CEU.

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Using the Internet as a Tool and a Resource

By Tommy Cheung, B.Sc.Pharm. and Certina Ho, B.Sc.Pharm., M.I.St.

Statement of objectives

Upon completion of this lesson, the pharmacy technician will be able to:

1. Understand the basics of the Internet, search logic and search engines.
2. Identify websites pertaining to pharmacy practice.

Introduction

The Internet is a tool that can assist pharmacy technicians and pharmacists deliver enhanced care and customer service. Although technicians do not directly counsel patients, their assistance in researching and locating accurate information in a timely manner is invaluable to pharmacists. By better understanding the Internet and knowing some reliable websites, pharmacy technicians provide valuable contributions to the pharmacy team.

Demystifying the Internet^{1,2}

The Internet is the largest computer network in the world. The term "World Wide Web" (WWW), or simply the "Web," is often used interchangeably with the Internet, but it is only one of the services offered by the Internet. Other services include electronic messaging/email, Internet telephone, Internet fax, file transfer, chat rooms, forums and others. Many terms are used when communicating about the Internet. A few of the most common are explained below:

Internet Protocol (IP) Address

To transfer information from one point to another, each com-

puter connected to this enormous network needs to be uniquely identified. The Internet network administrators assign an IP address to each computer for this purpose. These addresses usually appear in a series of digits, for example, 135.62.128.91.

Domain Name System (DNS)

DNS was developed to assign names to computers and devices on the Internet and provide sufficient information to access a website. Domain names are usually associated with certain companies or organizations and they are registered with the naming authority—Internet Corporation for Assigned Names and Numbers (ICANN). For instance, "dirc.ca" is the registered domain name for the Drug Information and Research Centre at the Ontario Pharmacists' Association.

Uniform Resource Locator (URL)

Uniform Resource Locator (URL) is the detailed address of a file located on the Internet.

A common example looks like this—<http://www.pharmacyconnects.com/index.html>—"http" stands for Hypertext Transfer Protocol and it is the service or protocol used by this

file on the Internet; "www.pharmacyconnects.com" is the domain name and it provides information about the computer hosting the file. Lastly, "index.html" is the actual name of the file or webpage.

Browsers

Browsers are software programs that allow access to and viewing of web content. Popular browsers include Internet Explorer, Netscape and Firefox.

Search Engines³

Search engines are online databases that provide a fully automated search process generated by software programs. A commonly used search engine is Google (www.google.ca).

Search logic³

If the pharmacy technician goes to their favourite search engine and types in a keyword or search term, the search results may be innumerable. To perform effective searches, technicians should understand how to use Boolean operators.

The three most common Boolean terms are "AND," "OR," and "NOT." When using "AND" to combine two or more search terms together, the search

results must present all the search terms specified, thus limiting the number of search results. If “OR” is used between search terms, the search results may include any of the pre-determined search terms, thus expanding the search results. For instance, performing a search in the same search engine on “acetaminophen AND ibuprofen” will generally give fewer results than a search on “acetaminophen OR ibuprofen.” The third Boolean term “NOT” is used less frequently and it will eliminate or exclude the second search term from the search results of the first. For example, a search on “fluoxetine NOT depression” will pull results that contain “fluoxetine” but will eliminate documents that contain “fluoxetine AND depression.”

Phrase searching

Often a search term may consist of multiple words, such as a search for the drug class “angiotensin converting enzyme inhibitor.” To ensure that all words in the search term are kept together, phrase searching is necessary. To do this, double quotes must be put around the phrase in the search term.

Wildcards

When performing a search that covers different forms of the search term—for example, a search for the keyword “treat,” which will simultaneously include a search for “treats,” “treating,” “treated,”

and “treatment”—wildcards can be used. This is done by adding a symbol (most search engines will use an asterisk [*]) at the end of the keyword, “treat*.” This symbol represents a single character or multiple characters in the keyword. Different search engines or databases may use different symbols for wildcard searches.

Websites on pharmacy

Internet resources can easily help with a number of drug-related questions techs may encounter. Knowing when, where and what to look for in particular websites pertaining to pharmacy practice is essential for making the Internet useful in the pharmacy. However, the Internet should be used to complement—not replace—traditional references in the pharmacy and not all websites are reputable. Criteria or guidelines for assessing whether or not a website is a credible resource is beyond the scope of this lesson.

The rule of thumb in dealing with drug information questions is to define the category of the specific request. Eight typical categories for which the Internet can be an efficient and valuable resource are discussed below. Corresponding websites are summarized in Table 1 (see next page).

Product availability

When looking for or verifying the availability or contents of a particular product, websites in the product availability

category will definitely help. The Drug Product Database (DPD) from Health Canada allows searches for active and discontinued Canadian products by drug company (or manufacturer), product (or brand) name, active ingredient (or generic name), drug identification number (DIN), or active ingredient group number. For newly approved products, the Notice of Compliance (NOC) Listings from Health Canada may also need to be consulted.

A similar search for American approved drug products can be performed using the Electronic Orange Book from Food and Drug Administration (FDA) of the United States.

Canadian regulations

Websites in this section provide information about drug scheduling, that is, whether a drug can be sold with or without a prescription, or whether a product should be kept behind the counter or can be sold over-the-counter. The national drug schedules can be found on the National Association of Pharmacy Regulatory Authorities (NAPRA) website. The NAPRA Drug Schedule database displays drugs alphabetically by generic name (via drugs search), or brand name (via products search) according to their schedules. Information on provincial legislation may be found on the websites of the provincial pharmacy licensing authorities, which can be locat-

ed using the links found on NAPRA website.

Extemporaneous compounding

Liquid formulations may not be readily or commercially available for some drug products. Recipes or formulations for extemporaneous compounding are necessary, for instance, in situations when the prescription is for a pediatric patient or for a patient who has difficulty swallowing solid dosage forms. The Hospital for Sick Children Pharmacy Manufacturing website offers recipes for some commonly requested liquid formulations.

General medical information

Patients often have questions about a disease or a medical condition. They may also request general information on a particular medication. U.S.-based MedlinePlus® Health Information and Medscape® are two resources where general medical and drug information can be found. In addition, most of the Merck Manual publications are offered online.

Drug safety and warnings

Websites in this category provide current and significant information on medications and other health issues. They usually provide information released by Health Canada or other similar government bodies, and generally create a great deal of media attention. Pharmacy staff members need to be well informed about this information in order to prepare for questions coming from patients and other customers. Many of these sites also offer email services and send subscribers notification of warnings and advisories once they are released.

Pregnancy and lactation

Pharmacy staff members are commonly asked questions about drug use during pregnancy and lactation. The

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Pharmacy
PRACTICE

Table 1: Useful Internet resources for pharmacy practice

DRUG INFORMATION CATEGORIES	LINKS*
Product Availability Drug Product Database (DPD) (Canada) Notice of Compliance (NOC) Listings (Canada) Electronic Orange Book (U.S.) EURO-Medicines (European Countries)	http://www.hc-sc.gc.ca/hpb/drugs-dpd/ http://www.hc-sc.gc.ca/hpfb-dgpsa/tpd-dpt/index_drugs_noc_e.html http://www.fda.gov/cder/ob/default.htm http://www.euromedicines.org/
Canadian Regulations National Association of Pharmacy Regulatory Authorities (NAPRA)	http://www.napra.ca
Extemporaneous Compounding Hospital for Sick Children Pharmacy Manufacturing Paddock Laboratories	http://www.sickkids.ca/pharmacy/section.asp?s=Manufacturing&slD=7232 http://www.paddocklabs.com/
General Medical or Patient Information MedlinePlus® Health Information Medscape® The Merck Manuals	http://www.nlm.nih.gov/medlineplus/ http://www.medscape.com http://www.merck.com/pubs/
Drug Safety and Warnings Health Canada Advisories, Warnings and Recalls Canadian Adverse Reaction Newsletters U.S. Food and Drug Administration MedWatch – Medical Product Safety Information	http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/index_e.html http://www.hc-sc.gc.ca/dhp-mps/medeff/bulletin/ar-ei_index_e.html http://www.fda.gov/medwatch/safety.htm
Pregnancy and Lactation Motherisk Prenatal and Perinatal Preventive Care American Academy of Pediatrics Perinatology	http://www.motherisk.org http://www.hc-sc.gc.ca/hppb/healthcare/pubs/clinical_preventive/sec1e.htm http://www.aap.org/ http://www.perinatology.com
Infectious Disease Johns Hopkins Antibiotic Guide Canadian Immunization Guide Centers for Disease Control (CDC) and Prevention (U.S.)	http://hopkins-abxguide.org http://www.phac-aspc.gc.ca/publicat/cig-gci/index.html http://www.cdc.gov
Third-Party Payers ClaimSecure Emergis ESI Canada Express Scripts Green Shield Canada	Interim Federal Health Refugee Program Johnson Inc. Non-Insured Health Benefits Veterans Affairs Canada Workplace Safety and Insurance Board
Provincial Drug Benefit Programs Alberta Health and Wellness Prescription Drug Programs British Columbia (BC) PharmaCare Manitoba Pharmacare Program New Brunswick Prescription Drug Program Newfoundland and Labrador Prescription Drug Program (NLPDP) Northwest Territories Health Benefits Programs Nova Scotia Pharmacare Nunavut Health and Social Programs Ontario Drug Benefit (ODB) Program Prince Edward Island Drug Cost Assistance Program Régie de l'assurance maladie du Québec (RAMQ) Saskatchewan Drug Plan Yukon Drug Programs	http://www.health.gov.ab.ca/ahcip/prescription/index.html http://www.healthservices.gov.bc.ca/pharme/generalinfo/generalinfoindex.html http://www.gov.mb.ca/health/pharmacare/index.html http://www.gnb.ca/0212/intro-e.asp http://www.health.gov.nl.ca/health/nlpdp/overview.htm http://www.hlthss.gov.nt.ca/Features/Programs_and_Services/progandserv.htm http://www.gov.ns.ca/health/pharmacare/default.htm http://www.gov.nu.ca/hsssite/hssmain.shtml http://www.health.gov.on.ca/english/providers/program/drugs/odbf_mn.html http://www.gov.pe.ca/infopei/Government/GovInfo/Health/Pharmacy_Services/Drug_Cost_Assistance_Programs/ http://www.ramq.gouv.qc.ca/en/citoyens/assurancemedicaments/index.shtml http://formulary.drugplan.health.gov.sk.ca/ http://www.hss.gov.yk.ca/prog/hs/index.html

* Updated October 6, 2005. This list is for example only and is not meant to be exhaustive. Links provided here may be changed in the future. Please update accordingly.

Internet has a number of reliable websites for this type of information. Organizations, such as Motherisk, Health Canada and the American Academy of Pediatrics, offer great websites on prenatal and perinatal care.

Infectious disease

Selecting an effective antibiotic for a specific infection can be a challenge in the world of changing resistance patterns and frequent new therapies. Websites, such as the Johns Hopkins Antibiotic Guide, allow users to search for information on

antibiotic use according to the causative microorganism, infection or specific therapeutic agent. Answers to questions on immunization schedules, missed vaccine doses, precautions in immunosuppressed individuals, and adverse events can be found in the comprehensive Canadian Immunization Guide published by Health Canada.

Third-party payers

Third-party payers and benefit carriers are using the Internet to provide information to pharmacy staff to facilitate claim submissions and adjudications.

For instance, the Ontario Drug Benefit Program provides an online formulary search that can be used to determine drug interchangeability, cost and coverage. Other provincial drug benefit programs are listed in Table 1.

Conclusion

Today the Internet is an indispensable component of everyday life. By becoming familiar with and attaining proficiency in the use of Internet resources related to pharmacy practice, pharmacy technicians can greatly support and contribute

to the pharmacy team in providing better patient care.

References

1. Turban E, Rainer RK, Potter RE. Introduction to Information Technology. John Wiley & Sons, Inc. 2001: 206-227.
2. Dean T. Network + Guide to Networks. 2nd edition. Course Technology. 2002: 534-5.
3. The Virtual Library Module 6 – Educational Resources on the World Wide Web. Education Commons – Information Resources & Services, OISE/UT Library 2002/2003.

QUESTIONS

Please select the BEST ANSWER for each multiple choice question.

1. In the following URL: <http://www.dirc.ca/staffdir.asp>, which part(s) is the domain name?

- a. http://
- b. www.dirc.ca
- c. staffdir.asp
- d. .asp

2. World Wide Web (WWW) is used often interchangeably with the term Internet, but this is not totally correct because:

- a. WWW encompasses other services but not the Internet
- b. Internet encompasses other services and not only WWW
- c. Internet encompasses other services but not WWW
- d. WWW refers to software programs that allow users to access the Internet

3. Can calcium channel blockers cause edema? What type(s) of search logic should be used for this question?

- a. Calcium channel blockers OR edema
- b. Calcium channel blockers AND edema
- c. Calcium channel blockers NOT edema

d. "Calcium channel blockers" AND edema

4. To cover a search for the terms "inject," "injection," "injectables," "injecting," "injects" and "injected," which of the following search logic options is the most appropriate?

- a. Inject OR injection OR injectables OR injecting OR injects OR injected
- b. Inject AND injection AND injectables AND injecting AND injects AND injected
- c. Inject*
- d. All of the above

5. Mr. Green. came to the dispensary and mentioned that he heard about a warning regarding Hepastat. He has been taking Hepastat as a dietary supplement to protect his liver. Which website will you consult to assist the pharmacist?

- a. Drug Product Database
- b. National Association of Pharmacy Regulatory Authorities
- c. MedlinePlus® Health Information
- d. Health Canada Advisories, Warnings and Recalls

6. Ms. Smith is two-months

pregnant and wants to take Echinacea for her cold. Is Echinacea considered safe to use during pregnancy? Where can you find the answer to this question?

- a. U.S. Food and Drug Administration MedWatch
- b. Motherisk
- c. The Merck Manuals
- d. Johns Hopkins Antibiotic Guide

7. Dr. Morgan is on the phone with the pharmacist and he would like to discuss the antibiotic treatment options for osteomyelitis. Which of the following websites will be helpful for answering this question?

- a. MedlinePlus® Health Information
- b. U.S. Food and Drug Administration
- c. Johns Hopkins Antibiotic Guide
- d. Canadian Immunization Guide

8. Ms. White would like to buy injectable Graval®. Can this be sold without a prescription? Where can you find this information?

- a. National Association of Pharmacy Regulatory Authorities
- b. Drug Product Database
- c. Health Canada Advisories, Warnings and Recalls

d. U.S. Food and Drug Administration MedWatch

9. You receive a prescription for Asendin® 100 mg. The Discontinued Products section in the Compendium of Pharmaceuticals and Specialties (CPS) shows that Asendin® was discontinued in 2001. Where will you check to see if a generic product is commercially available for Asendin®?

- a. Notice of Compliance Listings
- b. National Association of Pharmacy Regulatory Authorities
- c. Drug Product Database
- d. MedlinePlus® Health Information

10. Dr. Fisher would like to prescribe metronidazole for a three-year-old child. Which website(s) will you check for the pharmacist to determine whether an oral suspension formulation is available for this medication?

- a. Notice of Compliance Listings
- b. Hospital for Sick Children Pharmacy Manufacturing
- c. Johns Hopkins Antibiotic Guide
- d. All of the above

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