INFORMATION LITERACY ESSENTIALS:
HOW TO FIND WHAT YOU NEED WHEN YOU NEED IT

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INFORMATION LITERACY:
The set of skills needed to find, retrieve, analyze, and use information

1. IDENTIFYING INFORMATION NEED

Thinking about your information needs in terms of a spectrum can help you determine which resources will best meet your needs. For example, if your information needs are casual, such as looking up Harrison Ford’s birthday, a quick Google search should suffice. If you are writing a research paper, your information needs will be more substantial. You will need to conduct a systematic search of the literature using bibliographic databases in order to collect enough evidence to support your argument. Consider whether you need greater precision or greater retrieval.

INFORMATION TIMELINE: HOW INFORMATION IS PROCESSED

EVENT OCCURS → ASK THE SOURCE → INTERNET & TELEVISION → NEWSPAPERS → ACADEMIC JOURNALS → BOOKS, DATABASES, & GOVERNMENT PUBLICATIONS → REFERENCE BOOKS

TYPES OF RESOURCES:

PRIMARY: Primary resources are original documents written in the author’s own words. In scientific disciplines, primary resources include research studies (e.g., randomized controlled trials or cohort studies), case reports, editorials, and letters to the editor. With primary resources, you are able to evaluate research for factors such as study design or validity of study results in order to draw your own conclusions. Examples of primary resources include research articles published in the New England Journal of Medicine and the Journal of the American Medical Association.

SECONDARY: In pharmacy, secondary resources help you access primary resources. They include indexing and abstracting services that you can use to locate primary literature. Secondary resources provide bibliographic information, such as the citation and possibly a brief summary of an article, to let you know what kind of information a particular primary resource contains. Examples of secondary resources include PubMed/MEDLINE, International Pharmaceutical Abstracts, Iowa Drug Information Service, and Web of Science.

TERTIARY: Tertiary resources summarize and interpret the evidence from primary resources. Information contained in tertiary resources is considered to be established knowledge. Examples of tertiary resources include textbooks, drug databases, and government publications.
2. ACQUIRING INFORMATION EFFICIENTLY & EFFECTIVELY

To find relevant information more quickly, choose keywords that best represent the major concepts in your research topic. For example, if your research topic is “Patients with diabetes have a significantly increased risk of blindness and should take appropriate preventive measures,” your keywords should reflect the major concepts of “diabetes,” “blindness,” and “prevention.” Be aware that the best keywords may not always be the most obvious ones. In this search, you may have far better luck searching with the keyword “diabetic retinopathy.”

Remember to evaluate your search results. If you retrieve too many or too few results or the results are not relevant to your topic, refine your search! Once you find a great resource, use its index terms or bibliography to help find related resources.

BOOLEAN SEARCHING:

AND: Narrows your search results by telling the database that ALL of your keywords must be present in the resulting records
Example: “cloning” AND “humans” AND “ethics”

OR: Broadens your search results by telling the database that ANY of your keywords can be present in the resulting records.
Example: “high blood pressure” OR “hypertension”

NOT: Narrows your search results by telling the database to ignore concepts that may be implied by your keywords
Example: “Java” NOT “coffee”
Be careful when using NOT logic. You never know what you may throw out!

* (WILDCARD): Expands a keyword to include all forms of a root word
Example: “patent*” retrieves patent, patents, patented, patentable, etc.

Databases process Boolean operators from left to right:

“headaches AND aspirin OR ibuprofen” = “(headaches AND aspirin) OR ibuprofen”
“headaches AND (aspirin OR ibuprofen)” = “(headaches AND aspirin) OR (headaches AND ibuprofen)”

3. EVALUATING INFORMATION: “DID I JUST FIND C.R.A.P.?”

You have identified your information need and retrieved several information resources. It is important to evaluate these resources to make sure that the information is both credible and applicable to your topic. Evaluating your information resources also helps you review whether or not your search strategy was successful. If you did not find what you were looking for, you may need to modify your research question, adjust your keywords, and/or use alternative resources. Remember that quality information is available in a wide variety of formats, including articles, audio/visual media, books, databases, data sets, graphs, patents, and websites.
APPLYING THE C.R.A.P. TEST:

CURRENCY: - When was the information published or last updated?  
- Have newer articles been published on your topic?  
- Do the hyperlinks lead to pages that are permanently unavailable?

RELEVANCE: - Does the information answer your research question?  
- Does the information meet the requirements of the assignment?  
- Does the source add something new to your knowledge of the topic?  
- Is the information too technical or too simplified for you or your intended audience to use?

AUTHORITY & ACCURACY:

<table>
<thead>
<tr>
<th>DOMAIN SUFFIX</th>
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| .com Commercial sites | • For profit websites  
• Information generally sheds a positive light on promoted products |
| .edu Educational institutions | • Research centers and specific departments usually credible, but make sure to examine information carefully |
| .org Organizations | • Non-profit organizations usually credible, but make sure to check for potential bias |
| .gov U.S. government | • Provides credible, quality information for consumers, providers, and researchers  
• State government websites (e.g., [www.dhs.state.tx.us](http://www.dhs.state.tx.us)) also considered credible information resources |

- Does the information have an identifiable source or author?  
- Does the author or organization have the required expertise and training to provide the information?  
- Is the publisher’s or author’s contact information listed?  
- If you are using an Internet resource, what is its domain suffix?  
- Does the information contain spelling, grammatical, or punctuation errors?  
- Is any of the information incorrect?  
- Was the information reviewed by editors or subject experts prior to publication?  
- Is the information based on evidence from valid scientific studies?  
- Is the information supported by valid references and citations?  
- Do other sources confirm the validity of the information?

PURPOSE: - What was the author’s reason for making this information available?  
- Is there any bias or prejudice?  
- What is the overall tone of the resource?  
- Is the language neutral, or is the language strong and emotional?  
- Has the author misused or omitted data in order to support his or her argument?

4. USING INFORMATION APPROPRIATELY & ETHICALLY

Taking another person’s work or idea and passing it off as your own is considered literary theft and a violation of academic integrity. As healthcare professionals, plagiarism may also be considered medical misconduct.

Every time you use information, take a second to ask yourself:

1) **Do I have permission to use this information?**

2) **Is there a source I should give credit to?**
5. KEEPING CURRENT & LIFELONG LEARNING

As a pharmacy professional, self-directed lifelong learning is integral to providing the best care for our patients. Developing new knowledge and skills is an ongoing process that extends beyond the classroom to our daily interactions with the world around us. Being able to find, retrieve, analyze, and use information is essential if we want to keep current in our practice.

Many databases, journals, and websites offer free alert services. For example, PubMed allows you to save your searches and set up automatic e-mail alerts for citations that meet your search criteria as new articles are indexed. Journals may support Table of Contents alerts, e-mailing you the tables of contents when new issues are published. Google Alerts “monitor the web for interesting new content,” while many professional organizations and news publications provide e-newsletters or bulletins on current happenings. Social networking services, blogs, and forums are also useful tools to access breaking health news stories, connect with colleagues, and discuss ideas and collaborate in real time.

FIND A TOPIC, AND USE YOUR INFORMATION-SEEKING SKILLS TO SEE IT THROUGH. FOLLOW-UP IS THE KEY TO LIFELONG LEARNING.