



University of California
San Francisco

Drug Information

For Physical Therapists

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Patient Medication List

- Patient, MW, a 72-year old female with a history of diabetes and stroke, hands you her medication list:

Allergies: Penicillin, Morphine

Fosamax for osteoporosis

Glipizide for diabetes

Zestril for diabetes and hypertension

Warfarin for atrial fibrillation

Benadryl for allergies

Sertraline for cognitive function

Objectives

At the conclusion of this session, you should be able to:

- Name a key difference between drug information in package inserts and other drug information resources
- Search specific tertiary drug information resources
- Identify unbiased drug information references on the internet

Context

- Over 10,000 FDA-approved drugs and biologics
- Over 300,000 available over-the-counter products
- Pharmacists are the drug information experts
- All health care providers should be able to access and evaluate drug information resources
- To provide the best care health care providers must maintain professional competency, which, in part, involves knowing how to find high quality information and keeping current with the medical literature.

FDA-labeled indication

- The FDA approved label is the official description of a drug product which includes indication (what the drug is used for); who should take it; adverse events (side effects); instructions for uses in pregnancy, children, and other populations; and safety information for the patient. Labels are often found inside drug product packaging.
- Other uses (“off-label” or “non-approved” indications) are not included in materials provided by the FDA, including:
 - Label (aka “prescribing information,” “package insert,” or “PI”)
 - FDA website

What is drug information?

- Goal: provide carefully evaluated, literature-supported evidence to justify specific medication use practices to enhance the quality of patient care and improve patient outcomes
- May be:
 - Patient specific
 - Necessary part of patient care
 - Population based
 - Aid in decision making
 - Evaluating use in specific populations

DRUG INFORMATION RESOURCES

Tertiary References

- Documented information derived from primary literature publications presented in a condensed form
- Tertiary references include
 - Textbooks
 - Reference books
 - Computer databases
 - Handheld databases

Evaluating Tertiary References

Pros

- Broad background
- Easy and convenient access
- Concise information
 - Distilled information
 - References
- Institutional access

Cons

- Lag time
 - Publication date
- Potential author bias
 - Editorial board/author affiliations
- Often incomplete
- Cost

Tertiary Drug Information Resources for Healthcare Providers

FDA-approved indications:

- Prescribing information
 - Physician's Desk Reference
 - DailyMed
 - Package Insert
 - Manufacturer's website

FDA-approved and off-label (non-FDA approved) uses:

- Micromedex
- Drug Information Handbook
 - aka “Lexi-comp”
- Facts & Comparisons
- Consumer Drug Information Resources



Prescribing Information

- Also referred to as package insert or “PI”
- Contents
 - **FDA-approved indications**
 - Adverse effects
 - Contraindications and warnings
 - Dosing and administration
 - Drug interactions
 - Pharmacology and pharmacokinetics
- Location
 - DailyMed (<http://dailymed.nlm.nih.gov>)
 - Available online at no cost

Lexi-Comp Drug Information Handbook

- Published by Lexi-Comp
 - Available electronically via library website, UCSF Medical Center intranet & embedded within UpToDate*
- Contains >1500 monographs
 - FDA-approved and off-label indications
 - Dosage
 - Drug interactions
 - Adverse reactions
 - Contraindications
 - Available formulations

Hardcopy version:

- Arranged alphabetically by generic name
- Updated annually
- Extensive appendixes
 - Dosing equivalents
 - Nomograms
 - Treatment guidelines
- Not well-referenced

*Also available as an app

Micromedex

- Available online through library*
- Information about drugs, disease states, toxicology
- Drug consults (evidence-based reviews of drug therapy or disease state management)
- Various tools
 - Drug Interactions
 - Drug ID
 - International drug database
- Well-referenced

***Also available as an app**



Download Mobile Apps

**HINT: View the information in both the
“detailed document” and “summary document”**

Facts & Comparisons

- Available online via library, also as books and binders
- General drug information
- Tools
 - Comparative data tables
 - Drug Identifier
 - Drug Interactions
 - Drug search by disease/symptom
- Comprehensive reference materials
- Referenced
- User-friendly interface

Accessing references

- Library website → “Search and Find” → “Guides by topic” → “Pharmacy” → “Pharmacy & Pharmacology” → “Online Drug Resources (UCSF Only)”

Drug Resources

- [Red Book](#) 

Comprehensive access to current and accurate drug pricing information.

[more...](#)

- [Drug Facts and Comparisons](#) 

Up-to-date drug information, patient handouts, as well as information on nonprescription drugs, orphan drugs, pregnancy and lactation warnings. From the publishers of the definitive industry reference, Drug Facts and Comparisons®.

- [MICROMEDEX \(mobile\)](#) 

Comprehensive drug information.

- [AHFS Drug Information \(via StatRef!\)](#) 

Drug information from the American Society of Health-System Pharmacists (ASHP).

- [Lexi-Comp](#) 

This combined e-Formulary enables access to current UCSF, SFGH, Laguna Honda and Medi-Cal formulary information. The main function of formularies is to specify which medicines are approved to be prescribed under a particular contract. The development of formularies is based on evaluations of efficacy, safety, and cost-effectiveness of drugs.

Exercise

Focus within drug information resources on:

- Uses/indications
 - FDA-approved & Off-label indications
- Safety information
 - Precautions, Contraindications or Boxed Warnings
 - Drug interactions (lists or checking-tools)
- Monitoring parameters
 - Adverse events (side effects)
 - Including signs/symptoms of toxicity
- Product identification system

Sidebar: Safety Information

- **Black Box (Boxed) Warning:** This type of warning is also commonly referred to as a “black box warning.” It appears on a prescription drug’s label and is designed to call attention to serious or life-threatening risks.
- **Contraindications:** specific situations in which a drug, procedure, or surgery should not be used because it may be harmful to the person
- **Warnings & Precautions:** Safety information that should be considered when selecting the drug, may be used for associated risk of severe or life-threatening side effects, prolongation of, or new, hospitalization, diminished ability to perform ADLs
- **Adverse drug reaction (side effect):** any undesirable experience associated with the use of a medicine in a patient; may range from mild to severe

ONLINE RESOURCES

Drug Information Resources

- Consumers

- Lay-language (avoid medical jargon)
- 6th-8th grade reading level
- Complete general information
 - Indications (uses) and common dosing
 - Common and serious adverse events
 - Major drug-drug, drug-food interactions
- Balance of complete information and too much detail

Evaluating Online Resources



- Is the source credible?
 - Disclosure of owner/sponsor of the web page
 - Credentials of the authorship of the web page
- Is the information accurate and current?
 - Frequency of updates for the site
- Is the information appropriately detailed and referenced?
 - Information without references should receive low weight in clinical decision-making
- Does the site contain contact information?
- Does the site link to other nonaffiliated sites that consistently provide good information?

Health on the Net foundation



8 Principles:

1. Authoritative—qualifications of authors
2. Complementarity—supports but does not replace doctor-patient relationship
3. Privacy—personal data submitted to site remains confidential
4. Attribution—sources of information are cited and dated
5. Justifiability—claims made on site must be supported
6. Transparency—authors should be accessible with up-to-date contact information
7. Financial disclosure—funding sources
8. Advertising policy—advertisements must be clearly identified

Search HONcode certified web sites:

▼ Certificate of compliance with the Code of Conduct HONcode for health online information



Drugs.com
is in compliance with the HONcode



<http://www.drugs.com/>

Validity of certificate **01 Oct 2013 - Oct 2015**

▼ Close the detailed version

HONcode PIN number :

HONConduct756274

Date of initial review:

24 Dec 2001

Validity of certificate

01 Oct 2013 - Oct 2015

Date of last visit

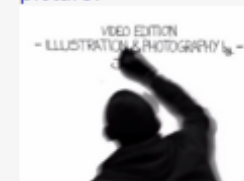
25 Feb 2014

Show the HONcode seal on this site

You will find below the elements identified by the HONcode team at a precise date to justify the respect of the 8 ethical principles.

1. Authority	ok, banners are marked
2. Complementarity	Advertisement (06 Jul 2011) - Link
3. Privacy	This advertising in no way affects the content of the drug information we supply. (01 Oct 2013) - Link
4. Attribution	Banner advertisements and sponsored links are distinguished by the word "Advertisement". (01 Oct 2013) - Link
5. Justification	
6. Transparency	
7. Financial Disclosure	
8. Advertising Policy	

▶ HONcode, a friendly motion picture:



▶ **Health Editors**
You have your own website ?
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Sites with HON Codes



YES:

- Drugs.com
- MayoClinic.org
- WebMD.com
- MedicineNet.com
- HealthCentral.com

NO:

- RxList.com
- Wikipedia
- Manufacturer websites
- Government websites
 - That's okay!!
 - “.gov” sites are reputable

Government websites



- Provide evidence-based, unbiased information of extremely high quality
- Key resources:
 - **National Institutes of Health (nih.gov)**
 - 28 Institutes & Centers within NIH
 - **National Library of Medicine (nlm.nih.gov)**
 - Oversees databases (e.g., PubMed/MEDLINE, MedlinePlus)
 - Consumer Health Information
 - Extensive drug information resources
 - **US Food and Drug Administration (fda.gov)**
 - **Centers for Disease Control (cdc.gov)**
 - Information on vaccinations, chronic diseases, travel health

Databases

PubMed/MEDLINE
MeSH
UMLS
ClinicalTrials.gov
MedlinePlus
TOXNET
Images from the History of Medicine
Digital Collections
LocatorPlus
All NLM Databases & APIs

Find, Read, Learn

Search biomedical literature
Find medical terminologies
Search NLM collections
Read about diseases
Learn about drugs
Explore history
Find a clinical trial
Use a medical dictionary
Find free full-text articles

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Biomedical Research & Informatics
Environmental Health & Toxicology
Health Services Research & Public Health
Health Information Technology

NLM for You

Grants & Funding
Meaningful Use Tools
Training & Outreach
Network of Medical Libraries
Regional Activities
Careers @ NLM
Mobile Gallery

News, Events, Videos

- Applications Being Accepted for 2016 NLM Georgia Biomedical Informatics Course (10/14/15)
- HHS Launches Redesigned Online Radiation Treatment Resource (press announcement) (10/08/15)
- NLM Announces Inaugural Annual Donald Lindberg and Donald King Lecture, October 7 (09/30/15)
- AIDS Source: A Redesigned, Mobile-Optimized HIV/AIDS Information Web Site from the National Library of Medicine (09/28/15)



Technical Bulletin



Connect with NLM



Multimedia Exhibition



Podcasts



NLM Tools & Widgets



Drug Information from the National Library of Medicine

▶ [Drug Information Portal](#)

The Portal provides users a comprehensive gateway to information on more than 20,000 drugs (over 200,000 unique searchable drug names and their synonyms) not only from NLM but also from other U.S. government agencies. It covers drugs from the time they are entered into clinical trials through their entry into the U.S. marketplace. The Drug Portal touches on all related information resources at NLM to provide for a comprehensive view. It is intended as a "middle ground" resource which includes information for the consumer, health professionals, and researchers.

▶ [Drugs, Herbs and Supplements](#)

Learn about your prescription drugs and over-the-counter medicines from MedlinePlus, the National Institutes of Health's Web site for patients and their families and friends. Read about side effects, dosage, special precautions, and more. Browse dietary supplements and herbal remedies to learn about their effectiveness, usual dosage, and drug interactions.

▶ [Pillbox](#)

Developed to aid in the identification of unknown solid dosage pharmaceuticals, Pillbox combines high-resolution images of tablets and capsules with appearance information (imprint, shape, color, etc.). It enables users to identify solid dosage forms based on physical criteria: imprint (characters or number printed on a medication), shape, color, size, and scoring. Users are shown thumbnail images of possible matches. These images are continually updated as the user enters additional information. Pillbox is designed for use by emergency physicians, first responders, other health care providers, Poison Control Center staff, and concerned citizens.

▶ [DailyMed](#)

DailyMed provides information about marketed drugs, including FDA labels (package inserts). It provides health information providers and the public with a standard, comprehensive, up-to-date, look-up and download resource of medication content and labeling as found in medication package inserts.

▶ [Dietary Supplements Labels Database](#)

The database links you to the information from the labels of over 4,000 dietary supplement products in the marketplace, including vitamins, minerals, herbs or other botanicals, amino acids, and other specialty supplements. It includes name, form, active and inactive ingredients, amount of active ingredient, manufacturer/distributor information, label claims, warnings, percentage of daily value, and additional label information. The database can be searched by product names, text terms found on product labels, specific dietary ingredients, and manufacturers.

▶ [RxNorm](#)

RxNorm provides normalized names for clinical drugs and links its names to many of the drug vocabularies commonly used in pharmacy management and drug interaction software, including those of First Databank, Micromedex, MediSpan, Gold Standard Alchemy, and Multum. By providing links between these vocabularies, RxNorm can mediate messages between systems not using the same software and vocabulary. RxNorm files are available through the NLM download server.

▶ [LactMed](#)

The database Drugs and Lactation, or LactMed, responds to the increased prevalence of breastfeeding worldwide. Drugs in breast milk pose a potential risk to the breast-fed infant, and LactMed provides healthcare practitioners and nursing mothers with data and information on drugs to which breastfeeding mothers may be exposed, and the effects of those agents on nursing infants and on lactation. LactMed contains about 1,000 records on drugs, herbals and dietary supplements that also include a summary regarding use of the specified substance during lactation, potential alternative medications, and references that are linked to their respective PubMed records. LactMed is endorsed by the American Academy of Pediatrics.

▶ [LiverTox](#)

The LiverTox database provides researchers, physicians, and patients with up-to-date and comprehensive information about drug induced liver injury. It contains drug records with concise data on medications, herbals, and dietary supplements that can affect the liver. LiverTox also includes a case registry that allows users to submit relevant clinical cases to LiverTox and the U.S. Food and Drug Administration (FDA).



Subscribe

[DailyMed Drug Label Updates](#)

Frequently Asked Questions

[Drug information including formulations and interactions](#)

[Costs of drug and medical procedures](#)

[Dietary supplements, complementary or alternative medicines](#)

[Drug screening](#)

Drug Information Portal

Quick Access to Quality Drug Information



United States
National Library of Medicine
National Institutes of Health

[Home](#)[News and Features](#)[NLM Resources](#)[NLM Research
Resources](#)[Resources by
Audience / Class](#)[Other Resources](#)[Mobile Site](#)

Information available for 47,859 drugs.

☒ By Name ☐ By Category

Go

- ▶ [Show examples.](#)
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- ▶ [Show top "By Category" searches \(previous seven days\).](#)
- ▶ [Show top dispensed prescriptions in the US Market, 2010.](#)
- ▶ [Show common drug names list.](#)
- ▶ [Show category names list.](#)
- ▶ [Show generic name stems list.](#)
- ▶ [Show list of resources searched.](#)



U.S. Food and Drug Administration

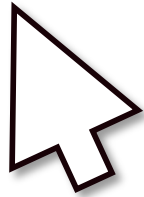
Protecting and Promoting *Your* Health

PROS

- User-friendly
- Searchable

CONS

- Extensive database
- Search may take you to a different field



For Consumers & Patients

Updates and information for staying safe and healthy



For Health Professionals

Medical product safety information, adverse event/problem reporting and more



For Scientists & Researchers

NCTR, pediatrics, clinical trials, Critical Path Initiative and more



For Industry

Guidance, registration and listing, import programs and more

Conclusions

- Drug labels and package inserts contain only information related to FDA-approved indications
- Other tertiary resources (e.g., Lexicomp) provide more comprehensive information on the various uses of OTC and prescription drugs
- It is important to recognize high-quality and unbiased drug information resources, especially if used by your patients
- Websites with the HON code and government websites are highly reliable sources of consumer and professional drug information
- Various drug information resources present information in different levels of detail, often with different information—it is important to use several to understand the pros and cons of each (and to choose your 1 or 2 go-to references)



questions