RFUMS College of Pharmacy

2020 Electronic Resources Guide

This Electronic Resources Guide is a list of online and mobile-based medical information resources that are available to all RFUMS faculty, preceptors, and students. This document is intended to assist healthcare students and providers in understanding, distinguishing, and accessing these high-quality, reliable resources.

Each year, the electronic resources committee (ERC) updates this document to highlight reliable mobile applications (iPhone/iPad and Android) and web-based resources that are relevant to healthcare providers. These resources may include both databases purchased by the RFUMS Boxer Library and also publicly available resources that have been evaluated by the ERC.

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Essential Resources

All RFUMS COP students are responsible for being familiar and competent with these "essential" resources.

AccessPharmacy (via Boxer Library)

- Houses "Pharmacotherapy: A Pathophysiologic Approach (Dipiro)" textbook
- Electronic access to 40+ additional pharmacy-related books
- Houses "CURRENT Practice Guidelines in Primary Care 2019" which summarizes recommendations from updated clinical guidelines
- Drug and herbal monographs are available by typing a drug name as a search term
- Self-assessment resources (e.g., NAPLEX and federal law review guides and custom practice tests, Top 200 Drugs Challenge, PK/PD and pharmacotherapy case vignettes)
- The library provides a guide explaining the basics of AccessPharmacy. To access it, click here, or go to http://guides.rosalindfranklin.edu/accesspharm

Clinical Pharmacology (via Boxer Library)

> **Mobile App Available**

- Detailed drug information, including drug class overviews and comparisons
- Drug interaction report, pill identification, IV compatibility, and product images
- Manufacturer contact information and patent expiration information
- Patient information handouts
- Lab reference values
- *For the mobile app, visit the Clinical Pharmacology website and click "Register" (top-right hand corner) to create a free account. Download "Clinical Pharmacology" by "Elsevier Inc" from the app store and use your new account credentials to login.*

Micromedex (via Boxer Library)

> **Mobile App Available**

- Gateway for a large number of databases, all of which are accessed when using the search function:
  - DrugPoints – Basic, summarized drug information
  - DRUGDEX – Advanced, extremely detailed and well-referenced drug monographs including international brand names
  - RED BOOK Online – Drug cost information
  - DISEASEDEX – Evidence-based treatment information
  - POISINDEX – Toxicology information and treatment algorithms
  - REPRODUCTIVE EFFECTS – Detailed pregnancy risk information for medications
  - Lab Advisor (laboratory reference values)
  - Drug interactions, pill identification, IV compatibility
- Information regarding the mobile app
  - The mobile app only includes Micromedex's DrugPoints Summary database. This is an abbreviated version of the more detailed DRUGDEX database (web-based only)

- o *For the mobile app, visit the Micromedex website and click "Download Center" (top-right hand corner). Write down the password from "Step 4" on the website. Download "Free Micromedex Drug Reference", "Micromedex Interactions", and "Micromedex Compatibility" by "Truven Health Analytics Inc" (on iOS) or by "Mobile Micromedex" (on Android) from the app store and use the password to activate the applications.*

Natural Medicines (via Boxer Library)

Mobile App Available

- − Drug information resources specifically for complementary and alternative medicines (CAM), including dietary supplements, natural medicines, herbals, and vitamins.
- − *For the mobile app, download "Natural Medicines" by "Therapeutic Research Center". Need to purchase individual subscription for full access.*

PubMed (via Boxer Library)

- − Gold standard database for original research and manuscripts (primary literature)
- − Reference to identify appropriate journal citations and abbreviations
- − MeSH term database can improve the scope and specificity of a search
- − Use the RFUMS PubMed link to have more full-text journal access ("Find at RFUMS")
- − The library provides a number of guides on the use of PubMed. To access the basic PubMed guide, click here or go to http://guides.rosalindfranklin.edu/intropubmed

UpToDate (via Boxer Library)

Mobile App Available

- − Detailed drug information for adults, pediatrics, and patients (from the LexiComp database)
- − Drug interaction reports
- − Peer-reviewed, fully referenced articles on a wide variety of topics
- − Information regarding the mobile app
  - o The mobile app requires an active internet connection and must be reactivated every 90 days by logging into the website to re-verify your RFUMS affiliation.
  - o *For the mobile app, visit the UpToDate website and click "Log In/Register" (top-right hand corner). Download "UpToDate" by "Wolters Kluwer Health" (on Android) or "UpToDate Inc" (on iOS) and use your new account credentials to login.*
  - o There is a video demonstration about accessing the UpToDate app here.

General Resources

The following resources are widely applicable to a variety of topics and specialties.
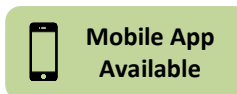
AccessMedicine (via Boxer Library)

- Electronic access to many book titles that have relevance to the pharmacy curriculum. Most books are written for specialties (e.g., emergency medicine, cardiology, neurology, etc.). Using the search function will help to identify relevant books and chapters.
- The library provides a video-based guide explaining the basics of AccessMedicine. To access it, click here, or go to http://guides.rosalindfranklin.edu/c.php?g=58558

ASHP Drug Shortages (http://ashp.org/Drug-Shortages)

- News and clinical guidance regarding drug shortage information
- Provides reason for shortages, duration of shortage, and alternative therapies for patient care

CDC Vaccine Schedules (mobile app)

- Official application of the Centers for Disease Control and Prevention (CDC) and ACIP (Advisory Committee on Immunization Practices) vaccination schedules for both adults and pediatric patients

Mobile App Available

- *For the mobile app, download "CDC Vaccine Schedules" by "Centers for Disease Control and Prevention"*

ClinCalc.com (http://clincalc.com)

- Evidence-based clinical decision support tools and calculators for medical professionals
- Includes pharmacokinetic calculators (with supporting mathematical equations), drug conversion tools, and inferential biostatistics calculators

ClinicalTrials.gov (http://clinicaltrials.gov)

- Registration database for many human clinical trials that are both actively recruiting or completed
- Not all trials are registered and not all results are available within the database

Cochrane Library (via Boxer Library)

- Independent, comprehensive evidence review of a wide variety of topics
- Articles are similar to a meta-analysis that follows a very strict, consistent format
- To date, includes 5000+ drug reviews and 2000+ treatment protocol overviews
- The library provides a guide explaining the basics of the Cochrane Library. To access it, click here or go to http://guides.rosalindfranklin.edu/cochranelibrary

DailyMed (http://dailymed.nlm.nih.gov)

− Repository of monographs (package inserts) of all FDA-approved prescription and over-the-counter products in the United States

Epocrates (mobile app)

− Drug information, pill identification, interaction checking, calculations, and informative tables - less detailed than LexiDrugs or Micromedex databases

Mobile App Available

− Physicians often use Epocrates for drug information before approaching a pharmacist with a question. As a pharmacist, it is useful to have a different, more robust drug reference.
− Similar drug information quality to Medscape
− *For the mobile app, download "Epocrates" by "Epocrates" (free with registration)*

GlobalRPh.com (http://globalrph.com)

− Comprehensive intravenous dilution and dosing calculators for busy clinicians
− Includes a wide variety of clinical resources including drug dosing calculators, clinical calculations, IV drug dilutions, clinical decision guides, and drug information

GuidelineCentral.com (http://guidelinecentral.com)

− Website and app offering free summary of certain guidelines. The creators state that the database is evolving and they are adding more guidelines and updates to current guidelines. It is hoping to replace the previously existing AHRQ's Guidelines Clearinghouse.

Mobile App Available

− Some pocket guides available for purchase which include flowcharts and tables
− Additional resources include clinical calculator, drug information, USPSTF recommendations, MEDLINE/Pubmed search engine, and Clinical Trials.gov search engine
− Can personalize by creating an account and setting a specialty preference; this provides autosync between website and app
− *For the mobile app, download "Guideline Central" by "International Guidelines Center, Inc."*

Immunize.org (http://immunize.org)

− Immunization Action Coalition (IAC) website providing educational materials regarding vaccinations for both healthcare providers and patients including patient handouts, vaccination screening forms, vaccination schedules, standing order protocols, and more.

Institute for Safe Medication Practice (ISMP) Resources

− Oral Dosage Forms That Should Not Be Crushed: **http://www.ismp.org/tools/donotcrush.pdf**
− List of Confused Drug Names: **https://www.ismp.org/tools/confuseddrugnames.pdf**
− List of Error-Prone Abbreviations, Symbols, and Dose Designations: **https://www.ismp.org/tools/errorproneabbreviations.pdf**

Medscape (mobile app)

- Prescription and herbal drug information - less detailed than LexiDrugs or Micromedex databases. Herbal products is not available in many other databases
- Drug interaction checking, calculations, and summary articles on a variety of topics
- Can subscribe for daily clinical updates and alerts via email
- *For the mobile app, download "Medscape" by "WebMD" (free with registration)*

Mobile App Available

PharmacyLibrary (APhA) (via Boxer Library)

- Houses "Handbook of Nonprescription Drugs" textbook
- Concise Pharmacotherapy First reviews with evidence-based guidelines
- 250+ active learning patient cases and exercises
- 3000+ NAPLEX review questions
- Electronic access to 26+ pharmacy-related books

Pharmacist's Letter (via Boxer Library)

- Monthly newsletter and online repository of past newsletters
- Content usually includes "clinical pearls", frequently asked questions, and brief introductions to recently approved medications
- Includes 600+ charts and tables related to medication therapy
- "Rumor vs. Truth" section to confirm or refute medication-related topics
- Information is provided in brief "snippets". This is not an appropriate resource when performing a comprehensive review of a complex topic.
- *For the mobile app, download "Pharmacist's Letter" by "Therapeutic Research Center". Need to purchase individual subscription for full access.*

Mobile App Available

Pillbox (http://pillbox.nlm.nih.gov)

- Free pill identification and image service provided by the National Institute of Health

VA Pharmacy Benefits Manager (PBM) (http://www.pbm.va.gov)

- Includes a wealth of free drug information used by the Veterans Affairs (VA) system
- Provides drug monographs, drug class reviews, clinical recommendations, and criteria for use for a variety of medications to help inform clinical practice and formulary decisions at the VA

Specialty Resources

The following resources focus on specific topics and may only be applicable in specialized scenarios.

ACEP Toxicology Antidote App (mobile app)

- Detailed information about toxicology treatment organized by antidote. For a specific drug overdose (such as acetaminophen), use the search feature.
- *For the mobile app, download "ACEP Toxicology Antidote App" by "American College of Emergency Physicians"*

Mobile App Available

ASCVD Risk Estimator Plus (http://tools.acc.org/ASCVD-Risk-Estimator)

- Atherosclerosis Cardiovascular Disease (ASCVD) 10-year risk estimation tool commonly used in evaluating a patient's risk for cardiovascular disease and potential eligibility for statin therapy
- *For the mobile app, download "ASCVD Risk Estimator" by "American College of Cardiology Foundation"*

Mobile App Available

LactMed (http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT)

- Detailed and well-referenced information regarding drug disposition in lactation
- *For the mobile app, download "LactMed" by "National Library of Medicine"*

Mobile App Available

Liverpool HIV Interactions (https://hiv-druginteractions.org)

- Detailed drug-drug interactions with HIV medications. As with other interaction tools, users are HIGHLY encouraged to use multiple resources (such as Micromedex and UpToDate) when assessing for drug interactions.
- *For the mobile app, download "Liverpool HIV iChart" by "Liverpool Drug Interactions Group"*

Mobile App Available

PubChem (https://pubchem.ncbi.nlm.nih.gov)

- Tertiary database regarding biological activities of small molecules
- Aggregates data from a variety of sources regarding substance information including molecular weight, chemical structure, molecular formula, MeSH synonyms for PubMed, logP, related compounds, chemical vendors, FDA orange book information, pharmacokinetic information, and more.

SciFinder (via Boxer Library)

- Information from CAS registry for substances and synthesis/transformation reactions
- References from CAplus and MEDLINE

Stahl Online (via Boxer Library)

- Entire current Cambridge portfolio of neuropsychopharmacology books by Dr. Stahl
- Includes electronic books, in-depth medication reviews, case studies, and illustrations

Notable Mentions in Mobile Applications

PAID MOBILE APPLICATIONS

Through an annual survey, the Electronic Resources Committee noted usage of the following paid mobile apps. As a committee policy, the ERC conducts a limited review of paid mobile applications and does not necessarily recommend or discourage their use.

> **Mobile App Available**

FlashRX ($4.99) †
- Flashcard-style and quiz-based review of the top 250 drugs

ICU Trials ($4.99) †
- Summarizes landmark clinical trials in the field of critical care

Johns Hopkins ABX Guide ($29.99 yearly)
- Summarizes infectious disease bug and drug information; similar to Sanford Guide
- No hardcopy available

JournalClub: Medicine ($6.99)
- Summarizes landmark clinical trials in a variety of clinical specialties
- Identical content is available for free at http://wikijournalclub.com

LexiDrugs ($75/year and up)
- Very similar drug database to UpToDate and includes off-label information, primary literature references, and clinical pearls from drug information experts
- Unlike the UpToDate mobile app, the database is stored locally on your mobile device, thus an internet connection is not required
- Consider "Lexi-Drugs" alone ($75/year), although other packages are also available

Sanford Guide - Antimicrobial Therapy ($29.99 yearly)
- Summarizes infectious disease bug and drug information; similar to Johns Hopkins ABX Guide
- Purchase a subscription via the website (https://store.sanfordguide.com) instead of through the mobile app to have support for both iPhone/iPad and Android devices
- Also available in hardcopy ("pocket edition") for $25

† Denotes a mobile application in which an RFUMS faculty member has a conflict of interest

MOBILE APPLICATIONS <u>NOT</u> RECOMMENDED

This is not a comprehensive list. The committee evaluated these mobile applications as suggested by students, faculty, or preceptors in an annual survey. The ERC feels that these resources are not as robust as other applications or are not appropriate for healthcare providers to use for drug information.

- **Davis's Drug Guide** – Inappropriate drug dosing information for the monographs evaluated by the committee

- **Drugs.com** – Intended audience is non-healthcare professionals

- **MPR (Monthly Prescribing Reference)** – Extremely brief and limited drug monographs, dosing information inadequate for the monographs evaluated by the committee

- **Pill Finder 2** – Although drug identification was correct, the app provided "no image" labels to medications that had confirmed images in other apps tested (iPharmacy Pill ID, Drugs.com, NIH Pill ID)

Databases for Research Purposes

The following databases are free or nearly free (<$1,000) that are useful for both student and faculty research projects. Be advised that RFUMS IRB approval is required for all human research even if the database is completely de-identified. Some of these databases do require technical expertise.

AACP: Research Funding Opportunities

(http://aacp.org/research-funding-opportunities)

 − Updated, aggregate list of funding opportunities for research projects from a variety of federal and non-federal sources. List produced by the American Association of Colleges of Pharmacy (AACP).

Databases for Research Projects (various URLs)

 − **Agency for Healthcare Research and Quality (AHRQ):**
   http://www.ahrq.gov/research/data/dataresources
   o **Healthcare Cost and Utilization Project (HCUP):**
     https://www.ahrq.gov/data/hcup/index.html
       ▪ Provide aggregate data on inpatient care, emergency department visits, and readmissions
       ▪ National Inpatient Sample (NIS), State Inpatient Database (SID), Kids' Inpatient Database (KID), Nationwide Emergency Department Sample (NEDS), State Emergency Department Databases (SEDD), and the Nationwide Readmissions Database
   o **Medical Expenditure Panel Survey (MEPS): http://www.ahrq.gov/research/data/meps**
       ▪ Provides patient-level data regarding healthcare utilization and out-of-pocket costs.
       ▪ Includes prescription-level details covering more than 3 million prescription fills per year.

 − **FDA's Adverse Event Reporting System (FAERS):**
   http://www.fda.gov/Drugs/GuidanceComplianceRegulatoryInformation/Surveillance/AdverseDrugEffects/default.htm
   o Database of adverse events and medication errors reports submitted to the FDA
   o Access to data must be done via FOIA request (freedom of information act)
   o Data is provided on compact disk sent via USPS

 − **Vaccine Adverse Event Reporting System (VAERS): https://vaers.hhs.gov**
   o National vaccine safety surveillance program by the CDC and FDA
   o Unlike FAERS, all data is readily accessible for download in raw format (without a FOIA request)

 − **Medical Information Mart for Intensive Care (MIMIC): https://mimic.physionet.org**
   o Large database of 40,000 ICU admissions at a single hospital in Boston, MA

- o Includes de-identified, patient-level data points of nearly all aspects of ICU care, including laboratory values, vital signs, progress notes, medications, and more.

- **National Health Interview Survey (NHIS):** **https://www.cdc.gov/nchs/nhis/nhis_questionnaires.htm**
  - o Yearly national survey tracking the health of the US population

- **National Health and Nutrition Examination Survey (NHANES):** **https://www.cdc.gov/Nchs/Nhanes**
  - o Studies the health and nutritional status of adults and children in the US using surveys and physical examinations.
  - o Includes demographic, socioeconomic, dietary, and health-related questions. The examination component consists of medical, dental, and physiological measurements, as well as laboratory tests.

Resources for NAPLEX Preparation

Particularly given recent changes to the NAPLEX exam, students are highly encouraged to consider multiple different resources as part of a study strategy. Each resource has its own strengths and weaknesses and using multiple resources should improve the chances of success on the exam.

BoardVitals

- Exam question bank with progress tracking and statistics regarding content area proficiencies
- Faculty may design and assign BoardVitals exams to students
- Access the resource via Boxer Library or http://www.boardvitals.com
- To sign up for BoardVitals:
    1. Visit the sign-up page: https://www.boardvitals.com/users/sign_up
    2. You must use your RFUMS email address to associate your account with the college
    3. Select "Pharmacy" as your profession
    4. Leave "Referred by" blank -- do not enter any text in this field.
    5. You must click the confirmation link within the email to have full access to the product.
    6. To start an exam, click on "Start" in the left-hand column and select the green "Go" button next to NAPLEX.

APhA PharmacyLibrary NAPLEX Review

- Access the resource via Boxer Library page.
- Exam question bank with progress tracking and statistics regarding content area proficiencies
- Users must create a free account to access exam question content and track progress

AccessPharmacy NAPLEX Review

- Access this resource via Boxer Library page.
- Exam question bank is accessible using the menu item "Study Tools" > "NAPLEX Review"
    o Lange Q&A Pharmacy
    o McGraw-Hill's NAPLEX Review Guide
    o Quick Review: Pharmacy
- Electronic books are available using the menu item "Books" > "Library" and selecting the "NAPLEX" subsection
    o McGraw-Hill's NAPLEX Review Guide

Physical Books

The Boxer Library carries hardcover versions of "Kaplan NAPLEX Review" available in the Reserve Collection at the Library Circulation Desk.

Patient Empowerment Tools

Following tool(s) are meant to be used with patients to enhance patient engagement and employ shared decision making in your clinical practice.

Mayo Clinic Shared Decision Making National Resource Center

- Free interactive decision making tools for chronic conditions
    - Depression, diabetes, primary prevention for cardiovascular disease, etc.
- More such tools under development
- Available at: https://shareddecisions.mayoclinic.org/