



RFUMS College of Pharmacy

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 include both databases purchased by the RFUMS Boxer Library and publicly available resources that have been evaluated by the ERC.

Symbol  means that these resources have mobile applications available.

Table of Contents

Essential Resources	2
General Resources	4
Specialty Resources	8
Notable Mentions in Mobile Applications	10
Databases for Research Purposes.....	12
Resources for NAPLEX Preparation.....	14
Resources for MPJE Preparation	15
Patient Empowerment Tools.....	16

Essential Resources

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

[AccessPharmacy](#) (via [Boxer Library](#))

- Includes “Pharmacotherapy: A Pathophysiologic Approach (Dipiro)” textbook
- Electronic access to 40+ additional pharmacy-related books
- Includes “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>

[Micromedex](#) (via [Boxer Library](#))

- 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
- The mobile app only includes Micromedex's DrugPoints Summary database. This is an abbreviated version of the more detailed DRUGDEX database (web-based only)
- *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](#))

- Drug information resources specifically for complementary and alternative medicines (CAM), including dietary supplements, natural medicines, herbals, and vitamins.
- Also has a tool to assess interactions with other supplements and drugs

- 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 gain full-text journal access, when available ("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)

- Detailed drug information for adult and pediatric patients (from the LexiComp database)
- Drug interaction reports
- Peer-reviewed, fully referenced articles on a wide variety of topics
- Information regarding the mobile app
 - 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.
 - 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.
 - 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, chapters, and images.
- 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) (<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](#)

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

[ClinCalc.com](http://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) (<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) and package labels of all FDA-approved prescription and nonprescription products in the United States

DynaMed (<https://www.dynamed.com/>)

- Detailed drug information for adult and pediatric patients (from the IBM Micromedex database)
- Drug interaction reports and clinical calculators
- A wide variety of peer-reviewed, evidence-based articles organized in a concise, easy to follow format
- No institutional subscription through RFUMS currently, but trial periods and individual purchase options available

Epocrates

- Drug information, pill identification, interaction checking, calculations, and informative tables - less detailed than LexiDrugs or Micromedex databases, but similar to Medscape
- Often used by non-pharmacist prescribers for drug information
- *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. Their goal is to replace the AHRQ’s Guidelines Clearinghouse, which is not currently available.
- Caution: The creators state that the database is evolving and they are adding more guidelines and updates to current guidelines. Please double check if a newer version of a given guideline is available via Pubmed search.
- 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 ClinicalTrials.gov search engine
- *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 templates, and more.

[Institute for Safe Medication Practice \(ISMP\) Resources](#)

- List of Look-Alike Drug Names with Recommended Tall Man (Mixed Case) Letters: <https://www.ismp.org/recommendations/tall-man-letters-list>
- 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 \(http://medscape.com\)](http://medscape.com)

- Prescription and herbal drug information - less detailed than LexiDrugs or Micromedex databases. Herbal products are 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)*

[Merck Manual Professional \(https://www.merckmanuals.com/professional\)](https://www.merckmanuals.com/professional)

- Free drug information resource for adult and pediatric patients
- Clinical images, videos, animations, tables, figures, and calculators
- Drug information powered by Elsevier
- Quizzes and case studies for practitioners
- *For the mobile app, download "Merck Manual Professional" by "Merck & Co Inc." (no sign-in required)*

[PharmacyLibrary \(APhA\) \(via \[Boxer Library\]\(#\)\)](#)

- Includes the "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.*

Pyrls (<https://www.pyrls.com/>)

- Drug information for students and practitioners in an aesthetically pleasing format
- 800+ abbreviated drug monographs, drug interaction tool, clinical calculators, charts and tables, and guideline database
- Paid version is required for full access of aforementioned resources
- For the mobile app, download “Pyrls” by Cosmas Health LLC

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](#)

- 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”*

[ASCVD Risk Estimator Plus \(http://tools.acc.org/ASCVD-Risk-Estimator\)](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”*

[COVID-19 Related Resources \(various URLs\)](#)

- These are just a few useful resources. Due to fast-paced updates and changes, please use the following links with discretion.
- Vaccine resources
 - <https://www.mass-vaccination-resources.org/>
 - <https://www.idstewardship.com/covid-19-vaccine-resources-pharmacists/>
 - <https://www.immunize.org/covid-19/>
- Treatment guidelines
 - <https://www.idsociety.org/practice-guideline/covid-19-guideline-treatment-and-management/>
 - <https://www.covid19treatmentguidelines.nih.gov/>
- Resources for pharmacists in Illinois
 - <https://www.ipha.org/covid-19>
- General resources for patients
 - <https://dearpandemic.org/>

[Idstewardship.com \(https://www.idstewardship.com/\)](https://www.idstewardship.com/)

- Collection of free and paid resources for learning antimicrobials and antimicrobial stewardship
- Student resources for learning antimicrobials and professional development
- Latest information about COVID vaccine and treatments

iForumRx (<https://iforumrx.org/>)

- Blog-based resource for ambulatory care practitioners providing evidence-based resources
- Offers summary of trials, guidelines, and ambulatory care practice establishment, training, and advancement resources
- Free access, but application based vetting takes place initially

LactMed (<https://www.ncbi.nlm.nih.gov/books/NBK501922/>)

- Detailed and well-referenced information regarding drug disposition in lactation
- *Available as an online database via the NIH; app no longer supported by NIH*

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”*

MotherToBaby (<https://mothertobaby.org/>)

- Free drug information resource for pregnancy and lactation related topics
- 250+ exposure sheets for medication, vaccines, and substance during pregnancy and lactation in English and Spanish
- Blogs, podcasts, and patient education materials for maternal and fetal health
- 24/7 drug information support for patients and providers
- LactRx app – Information about medication, vaccines and substances use during pregnancy from LactMed Database
- For the free mobile app, download “LactRx” by MotherToBaby

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. Additionally, the cost for each application are updated periodically and also depends on purchase options; i.e. one-time purchase versus yearly subscription.

FlashRX[†]

- Flashcard-style and quiz-based review of the top 250 drugs

ICU Trials[†]

- Summarizes landmark clinical trials in the field of critical care

Johns Hopkins ABX Guide

- Summarizes infectious disease bug and drug information; similar to Sanford Guide
- No hardcopy available

JournalClub: Medicine

- Summarizes landmark clinical trials in a variety of clinical specialties
- Identical content is available for free at <http://wikijournalclub.com>

Lexicomp

- Offers similar drug database to UpToDate, however unlike the UpToDate mobile app, the database is stored locally on your mobile device, thus an internet connection is not required
- The Essential Package (basic one) includes Lexi-Drugs, Lexi-Interact, Lexi-Pharmacogenomics, Drug Allergy & Idiosyncratic Reactions, Off-label Drug Facts, and Lexi-CALC
- Other more comprehensive packages are also available

Sanford Guide

- 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”)

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

MOBILE APPLICATIONS NOT 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](#)

(<https://www.aacp.org/resource/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 (AAPC).

[Databases for Research Projects \(various URLs\)](#)

- **Agency for Healthcare Research and Quality (AHRQ):**
<http://www.ahrq.gov/research/data/dataresources>
 - **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
 - **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>
 - Database of adverse events and medication errors reports submitted to the FDA
 - Access to data must be done via FOIA request (freedom of information act)
 - Data is provided on compact disk sent via USPS
- **Vaccine Adverse Event Reporting System (VAERS):** <https://vaers.hhs.gov>
 - National vaccine safety surveillance program by the CDC and FDA
 - 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>
 - Large database of 40,000 ICU admissions at a single hospital in Boston, MA
 - 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
 - Yearly national survey tracking the health of the US population

- **National Health and Nutrition Examination Survey (NHANES):** <https://www.cdc.gov/Nchs/Nhanes>
 - Studies the health and nutritional status of adults and children in the US using surveys and physical examinations
 - 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

Students are highly encouraged to consider multiple different resources as part of a NAPLEX study strategy. Each resource has its own strengths and weaknesses and using multiple resources should improve the chances of success on the exam. College provides fourth year students additional resources such as RxPrep and practice exams such as NABP NAPLEX practice test during the APPE year.

[BoardVitals \(via Boxer Library\)](#)

- Exam question bank with progress tracking and statistics regarding content area proficiencies
- Faculty may design and assign BoardVitals exams to students
- 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 \(via Boxer Library\)](#)

- 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 \(via Boxer Library\)](#)

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

[RxPrep \(via College of Pharmacy Subscription\)](#)

- Electronic resource made available to 4th year pharmacy students during P4 year
- Self-review (written and video) and self-assessment tools

[Physical Books](#)

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

Resources for MPJE Preparation

Depending on the state one is considering to practice in, the law and therefore the resources for MPJE would vary. Historically, most RFUMS COP students have taken Illinois and Wisconsin MPJE exams. Therefore, resources specific to these two states are included versus including resources for all 50 states. College provides fourth year students additional resources such as NABP MPJE practice test during the APPE year. In addition to the NAPLEX resource from RxPrep, MPJE unit can be purchased by the student.

E-Books (via [Boxer Library](#))

- 3 books available through AccessPharmacy; all 3 of them include review of the federal law
 - Pharmacy and Federal Drug Law Review – includes practice question bank for self-assessments
 - Pharmacy Law Examination and Board Review – includes brief summaries for some of the state specific laws
 - Pharmacy Practice and Tort Law – offers case studies

Illinois Pharmacy Laws and Regulations (via [LexisNexis](#))

- Online book that combines all resources pertaining to IL laws into one platform
- Individual purchase available at the URL above

Wisconsin Pharmacy Law Review (via [Pharmacy Society of Wisconsin](#))

- Digital guide offered by the Pharmacy Society of Wisconsin
- Updated periodically
- Same price for member and non-members, but sometimes special grad discounts are offered

State Professional Regulation Sites

- Each state has their pharmacy board and profession related resources curated on a webpage that are updated periodically as necessary
- They are the single most source of most updated and accurate information about specific regulations pertaining to practice of pharmacy in a given state
- Pharmacy law and regulation information on the Illinois Department of Financial & Professional Regulation is available at: <https://www.idfpr.com/profs/pharm.asp>
- Pharmacy law and regulation information on the Wisconsin Department of Safety and Professional Services is available at: <https://dsps.wi.gov/Pages/RulesStatutes/Pharmacy.aspx>

DEA Pharmacist Manual

- Outlines the Federal Control Substances Act and implementing regulations for pharmacists
- Periodically updated by the Drug Enforcement Administration
- Current version (2022) available at: [https://www.deadiversion.usdoj.gov/GDP/\(DEA-DC-046R1\)\(EO-DEA154R1\) Pharmacist's Manual DEA.pdf](https://www.deadiversion.usdoj.gov/GDP/(DEA-DC-046R1)(EO-DEA154R1) Pharmacist's Manual DEA.pdf)

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.

Care That Fits (<https://carethatfits.org/>)

- Free interactive shared decision making tools for chronic conditions such as depression, diabetes, and primary prevention for cardiovascular disease
- Developed by Mayo Clinic's Knowledge and Evaluation Research Unit
- More such tools under development