Understanding Drug Information, Drug Names, and Pronunciations

Drug therapy has become increasingly complex and the number of new drugs approved for use has significantly increased during the past decade. The result is that pharmacy technicians are frequently challenged with drug information questions throughout the workday and must become knowledgeable about the handling, availability, and uses of medications. A basic knowledge of drug information resources available will help prepare technicians to assist pharmacists with certain drug information requests.

Pharmacy reference books and electronic media, including the Internet, that are available in practice settings often hold the answers to typical, day-to-day practice-related questions. These resources can also be used as study aids for the technician certification examination and to expand a technician's general knowledge about medications. Therefore, it is essential that technicians understand the basics about frequently used reputable pharmacy references.

The purpose of this appendix is to classify the various types of drug information requests, explain which types of questions are appropriate for pharmacy technicians to answer, and list resources that can be used to find answers to drug information requests. This appendix also provides information regarding drug naming conventions and pronunciations. With time and practice, technicians will be able to find the information that they need quickly and efficiently and become even more valuable members of the healthcare team.

THE DRUG INFORMATION REQUEST

A drug information request is simply a question regarding a medication. The person requesting the information, the requestor, can be a nurse, doctor, other healthcare professional, or patient. The request might be asked over the telephone, in person, or via fax or e-mail. The request may be simple, requiring little time to research and answered quickly, such as "What is the generic name of Lipitor?" Other requests may be complicated, requiring a significant amount of research before they can be answered, such as "What is the safety of fluoxetine (Prozac) in pregnancy?"

Before responding to a drug information request, technicians must clearly differentiate questions that fall within their scope of practice. In general, if a question requires specific knowledge about a medication and/or professional judgment, it should be answered by a pharmacist. An example is a patient wanting to know whether he or she is experiencing a side effect from a medication. The pharmacist needs to obtain patient-specific information, research whether the medication could cause the side effect, and use his or her professional judgment to determine whether the side effect could be due to the medication or something else going on with the patient. In some cases, the distinction between the two types of questions may not be apparent. If there is any doubt about the nature of the question, the technician should defer the question to the pharmacist.

It is important to identify the person initiating the request, and when the request comes over the telephone, to obtain contact information (phone, pager, fax, etc.) in case the person needs to be called back. The search for and response to drug information requests will differ depending on who requests the information. Knowing information about the requestor, including his or her training and knowledge of the subject, will impact the final response and how it is given. For example, if a pharmacist is asked how the drug ondansetron (Zofran) works, he or she would respond differently if the request was from a patient compared to a physician. When answering questions from patients, medical terminology should be avoided, and the response should be put into language that patients can understand. The answer would be more in-depth to a physician, and written information might also be provided. Obtaining information about the purpose of the request will help to determine the needs of the requestor and whether it involves clinical judgment, requiring the expertise of a pharmacist. It will also make the search for information more efficient. It is important to find out if the information is for general knowledge or if it pertains to a specific patient. If the question involves a specific patient, the pharmacist will need to obtain background information to respond to the question. For example, if a physician asks what the dose of gabapentin (Neurontin) is, the pharmacist needs to know if it is for a specific patient and, if so, what the indication is, the patient's age, kidney function, other medications, allergies, etc.

The urgency of the request and the extent of information needed should also be determined so that an appropriate amount of time is allotted to answer the request. Often, part of the question can be answered initially (if needed urgently), with the remainder of the answer provided later, allowing time to research a more thorough response. For example, a physician calls and wants to know if the pharmacy stocks a new drug that has recently been Food and Drug Administration (FDA) approved. Upon further questioning, it is discovered that she has a patient in her office that might benefit from the drug and she needs to know if the drug is available. She would also like some written information about the drug. This is an urgent request, and the initial answer is no, the drug is not stocked in the pharmacy and does not appear to be available at the wholesaler yet. Because the drug is not even available yet, the request is no longer urgent. The technician can call the wholesaler and/or the manufacturer to find out when the drug will be available and the pharmacist can gather information about the new drug and follow up with the physician at a later time.

After information is gathered about the request and the requestor, it is helpful to identify the type of question that is asked, or to classify the request. Classifying the type of request helps to narrow the search and make the search process more efficient. Many of the questions that technicians encounter fall into the categories outlined in **Table D-1**.

Table D-1. Classifications of Drug Information Questions Answered by Technicians

Question Classification	Examples
General	■ What is the brand name of warfarin? ■ Do Naprosyn and Aleve contain the same active ingredient? ■ Who manufactures Humira? ■ Is Prilosec available in a generic? Is it a prescription or over-the-counter (OTC) product? ■ Where can I find the phone number for Allergan? ■ When will the patent for Trintellix expire? ■ Where can I find the Vaccine Information Sheet for the influenza vaccine?
Availability and Cost	■ Which dosage forms of Imitrex do you have in stock? ■ Is Zoloft available in a liquid? What size and concentration is available? ■ What are the prices of Adalat CC and Procardia XL? ■ How long it the shortage of albumin expected to last?
Storage and Stability	■ Should enoxaparin be stored in the refrigerator? ■ How long is a flu shot stable after it is drawn up in a syringe?
Calculations	■ How many milliliters are in an ounce? ■ How many milliliters of azithromycin are needed for a 5-day course of therapy?
Preparation	■ How should ampicillin injection be reconstituted? ■ What is the recipe for spironolactone suspension?

CONDUCTING THE SEARCH: CHOOSING THE RIGHT REFERENCES

There are many drug information resources available. The key to answering questions quickly and accurately is to know where the necessary information is likely to be found. Not all references contain every possible answer to every drug information question. At times, it may be difficult to find a reference that contains the information that you are seeking. Pharmacists may use multiple resources to validate the information that is found, such as the dose of a medication for a pediatric patient or the significance of a drug interaction. As part of a systematic search strategy, tertiary references are used first, then secondary references, and, finally, primary references

Tertiary references include print or electronic textbooks (e.g., compendia such as American Hospital Formulary Service Drug Information (AHFS DI), Micromedex, or Lexi-Comp handbooks; review articles; or information found on the Internet). Secondary references include indexing systems such as PubMed/ Medline, which provides a list of journal articles on the topic that is being searched. Primary references are original research articles published in scientific journals, such as the *American Journal of Health-System Pharmacists* (*AJHP*) or the *Journal of the American Pharmacists Association* (*JAPhA*).

Drug information databases are integrated within many computer systems and automated dispensing cabinets, offering drug information directly at the point of care. There are many references that are also available as mobile phone apps. Other resources include pharmaceutical manufacturers and specialized drug and poison information centers. **Table D-2** lists examples of commonly used drug information resources and a summary of the type of information contained in the resources.

Internet

The Internet is a useful source for drug information when used appropriately. Pharmaceutical manufacturers often have reputable sites because they should only have FDA-approved content on them. Government sites are usually reputable because experts have

Table D-2. Commonly Used Drug Information Resources

Resource	Publisher	Description
AHFS Drug Information	ASHP	General drug information (drug monographs and therapeutic guidelines) in print and electronic formats
AHFS Clinical Drug Information	ASHP	General drug information (combines *AHFS DI*, off-label drug use, current drug shortage information, real-time drug and safety updates) in an interactive electronic format
Lexicomp *Drug Information Handbook* *Pediatric & Neonatal Handbook* *International Trade Names Index* *Drug Information Handbook for Oncology*	Wolters Kluwer	Available as print handbooks, online, and mobile drug information with an interactive drug interactions tool Provides general drug information and specialty information for pediatrics and oncology
Facts & Comparisons eAnswers Drug Facts and Comparisons A to Z Drug Facts Off-Label Drug Facts *Brigg's Drugs in Pregnancy and Lactation* Natural Products Database Manufacturer Index	Wolters Kluwer	Online drug information database with drug monographs and comparative charts Additional modules for off-label drug use, drug use in pregnancy and lactation, natural products, and manufacturer index and contact information
Clinical Pharmacology Trissel's 2 Clinical Pharmaceutics MedCalc 3000 Index Nominum	Elsevier/Gold Standard	Online drug information database with drug monographs for general drug information Additional modules available for injectable and extemporaneous compounded products, clinical calculators, and global drug name directory
Micromedex Drug Information NeoFax and Pediatrics CareNotes patient information Red Book Toxicology Management	IBM Watson Health	Online drug information interactive database for general and specific drug information Drug monographs, IV compatibility, drug interactions, price and availability, patient information, toxicology

Table D-2. (continued)

Resource	Publisher	Description
Drugs.com	Drugs.com	Comprehensive online drug information on prescription, OTC, and natural products Contains a drug database, pill identifier, interactions checker, patient information, a pharmaceutical company database, and other features
United States Pharmacopeia and the National Formulary (USP–NF)	The United States Pharmacopeial Convention	The USP contains monographs for drugs, dosage forms, and compounded preparations The NF contains excipient monographs This reference is the official compendia for drugs marketed in the United States, and drugs must conform to the standards in this reference
The Orange Book: Approved Drug Products with Therapeutic Equivalence Evaluations	US Food and Drug Administration (FDA)	Drug products approved by the FDA, including therapeutic equivalence evaluations for multisource prescription products, as well as biologics, discontinued drugs, OTC drug products, and patent and exclusivity information
USP Dictionary of US Adopted Names and International Drug Names	The United States Pharmacopeial Convention (USP)	Illustrations of chemical structures and names of nonproprietary drugs in the United States and other countries as well as a pronunciation guide
Physician's Desk Reference (PDR)	PDR, LLC	Drug prescribing information and tablet identification in print, online, and mobile options
Pediatric Injectable Drugs: The Teddy Bear Book	ASHP	Injectable drug information specifically addressing issues unique to pediatric patients
Handbook on Injectable Drugs	ASHP	Compatibility, stability, storage, and preparation of injectable drugs
King Guide to Parenteral Admixtures	King Guide Publications	Stability and compatibility data for injectable drugs
Extended Stability for Parenteral Drugs	ASHP	Stability of injectable drugs beyond the usual 24-hour limit for alternate infusion sites
Trissel's Stability of Compounded Formulations	APhA	Stability information of drugs compounded for oral, enteral, topical, ophthalmic, and other specialized preparations
Natural Medicines	Therapeutic Research Center	Evidence-based database of information on safety and effectiveness of natural medicines and alternative therapies
Pharmacist's Letter	Therapeutic Research Center	Drug information, drug comparisons charts, pharmacy practice and disease-related charts and guidelines, latest clinical trial results, patient education, and best practice information
Pharmacy Technician's Letter	Therapeutic Research Center	Technician tutorials for essential skills, error prevention, dispensing, and patient-oriented resources, latest news and research
Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care	APhA	Nonprescription drugs, nutritional supplements, medical foods, and complementary therapies, and nondrug and preventive care

Table D-2. (continued)

Resource	Publisher	Description
Poison Control Centers	American Association of Poison Control Centers (AAPCC; 800-222-1222)	In case of poisoning or if overexposure occurs, a poison control center should be called Callers will be automatically routed to their local poison control center 24 hours a day, 7 days a week Local poison control centers have valuable resources and training materials for poison prevention activities
Safety Data Sheets (SDS), formerly called Material Safety Data Sheets (MSDS)	Available directly from manufacturers; various online sites offer limited access or subscriptions Refer to employer for information on how to access	Information on the potential hazards associated with a material or product, safe use and spill-handling procedures

IV = intravenous, OTC = over-the-counter.

reviewed the information and there is no conflict of interest (i.e., they aren't selling anything). Pharmacy and medical organizations often have their information reviewed by experts in the particular field and are therefore considered reputable. Commercial or personal sites can contain erroneous and/or misleading information, especially if a product is being sold. Information found on the Internet should always be evaluated for believability, the validity of the source, accuracy, supporting evidence, and timeliness. **Table D-3** lists useful websites that can be accessed for drug information, including a brief description of what each site contains.

Drug Names

The Food, Drug, and Cosmetics Act requires that all drugs have an "established name," or a nonproprietary name, other than the chemical name. The United States Adopted Names (USAN) Council establishes nonproprietary names for drugs and biological substances. The United States Pharmacopeial Convention (USP), FDA, American Medical Association, and American Pharmacists Association participate in the USAN Council. The USP Nomenclature Expert Committee usually accepts the nonproprietary names adopted by the USAN.[1] The

Nomenclature committee also develops and maintains a *Pronunciation Guide* for drug substances and excipients, which is used by USAN.[2]

Oversight of brand names is the responsibility of FDA, which works with the applicants (drug manufacturers) when reviewing and approving New Drug Applications, Abbreviated New Drug Applications, and Biologics License Applications. The FDA division responsible for reviewing and approving new product names is the Division of Medication Error Prevention and Analysis (DMEPA) and the Office of Prescription Drug Promotion (OPDP). The DMEPA's focus is on safety, comparing proposed names to existing ones to determine the likelihood for confusion. The OPDP focuses on reviewing names that could lead someone to draw an overly positive conclusion about the products' benefits. They assess whether a name might overstate the product's efficacy, imply minimized risk, broaden product indications or make unsubstantiated superiority claims.

Despite this review prior to marketing, medication errors can occur due to similar names. Healthcare professionals are encouraged to report drug names that have the potential to or have contributed to medica-

Table D-3. Useful Websites for Obtaining Drug Information

Website Name	Description	Address (URL)
US Food and Drug Administration (FDA)	Home page for the FDA; contains numerous useful links for consumers and healthcare professionals	www.fda.gov/default.htm
Drugs@FDA: FDA Approved Drug Products	Information about FDA-approved drugs; complete prescribing information and approval history	www.accessdata.fda.gov/scripts/cder/daf/index.cfm
REMS @ FDA: Approved Risk Evaluation and Mitigation Strategies (REMS)	Links to REMS for individual drugs that are required by FDA to have a REMS to ensure that the benefits of a drug or biologic product outweigh the risks	www.accessdata.fda.gov/scripts/cder/rems/index.cfm
Medication Guides	Links to FDA-approved Medication Guides	www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=medguide.page
FDA Drug Shortages	Information about current and resolved drug shortages and discontinuations reported to FDA	www.accessdata.fda.gov/scripts/drug-shortages/default.cfm
FDA Drug Recalls	Links to voluntary drug recalls taken by companies to remove a defective drug product from the market	www.fda.gov/Drugs/DrugSafety/DrugRecalls/default.htm
MedWatch: The FDA Safety Information and Adverse Event Reporting Program	Information from FDA about safety information regarding medical products; one can report a problem here also	www.fda.gov/Safety/MedWatch/default.htm
Centers for Disease Control and Prevention (CDC)	Home page for the CDC; information about diseases and conditions, vaccines, traveler's health, emergency preparedness, and other topics	www.cdc.gov
CDC Vaccine Information Statements	Link to Vaccine Information Statements (VIS) that explain the risks and benefits of vaccines	www.cdc.gov/vaccines/hcp/vis/index.html
CDC Immunization Schedules	Information on recommended vaccination schedules for adults and pediatrics and other resources	www.cdc.gov/vaccines/schedules/index.html
National Institutes for Health (NIH)	Home page for the NIH; information about health topics, clinical trials, and the various divisions of the NIH	www.nih.gov
US National Library of Medicine: DailyMed	Official provider of FDA label information (package inserts) of drugs marketed in the United States	https://dailymed.nlm.nih.gov/dailymed/
US National Library of Medicine: PubMed	PubMed is a searchable database of millions of citations for biomedical literature from MEDLINE, life science journals, and online books	www.ncbi.nlm.nih.gov/pubmed/
US National Library of Medicine: MedlinePlus	MedlinePlus is a website for consumers with information about diseases, conditions, health topics, drugs and supplements; also contains videos and tools	https://medlineplus.gov
US National Library of Medicine: ClinicalTrials.gov	A database of clinical trials being conducted around the world	www.clinicaltrials.gov

Table D-3. (continued)

Website Name	Description	Address (URL)
ASHP	Home page for ASHP; news related to health-system pharmacy and many helpful links for pharmacy professionals	www.ashp.org
ASHP Pharmacy Technician	Pharmacy technician section of the ASHP website; information on news, articles, toolkits, forums, and other resources geared for technicians	www.ashp.org/pharmacy-technician
ASHP Drug Shortages Resource Center	Up-to-date information on current drug shortages, including which products are affected and why, the anticipated time to resolution, and alternatives	www.ashp.org/Drug-Shortages
ASHP SafeMedication	Website for patient medication information, including My Medicine list and medication tips and tools	www.safemedication.com
American Pharmacist Association (APhA)	Home page for APhA; news related to pharmacy and many helpful links and resources for pharmacy professionals	www.pharmacist.com
Institute for Safe Medication Practices (ISMP)	Homepage for the ISMP; medication error education and alerts, a section for reporting, medication error tools and resources	www.ismp.org
NeedyMeds	Online resource for medication and healthcare-related patient assistance programs	www.needymeds.org/about

tion errors to FDA's MedWatch website: www.fda.gov/medwatch.[4]

Drug names contain a "stem" to identify a group of related drugs with common characteristics, such as similar mechanisms of action. **Table D-4** lists stem elements of common drug names. The stem can be a prefix (at the beginning of the name), infix (middle of the name), or suffix (end of the name).[5,6]

There are prefixes and infixes with specific meanings. For example, *Ar–*, *es–*, *lev–*, and *dex–* are used to name stereoisomers of drugs that are already named, such as formoterol–arformoterol, albuterol–levalbuterol, and lansoprazole–dexlansoprazole.

Drugs that have two-word names are usually salts, esters, or prodrugs. The active portion of the drug is listed first and the second word is the inactive portion,

or the part of the ester or prodrug that is released in the body to the pharmacologically active component.[7] Examples include enalapril maleate, which is a prodrug that is converted to enalaprilat, and fosaprepitant dimeglumine, which is a prodrug that is converted to the active drug, aprepitant.

Monoclonal antibodies are named similarly. They all contain a prefix, an infix that represents the target, and the stem *–mab* used as a suffix. The prefix is a syllable or group of syllables that is used to create a unique name. The inflix contains information about the action or use of the antibody. The USAN has specific syllables that represent diseases or targets[8]:

- *ami-* = serum amyloid protein (SAP)
- *ba-* = bacterial
- *ci* = cardiovascular

- *d(e)* = endocrine
- *fung* = antifungal
- *gros* = skeletal muscle mass-related growth factors and receptors
- *ki* = interleukins
- *li* = immunomodulating
- *ne* = neural
- *os* = bone
- *ta* = tumors
- *toxa* = toxin target
- *vet* = veterinary use
- *vi* = viruses, antiviral indications

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Understanding monoclonal antibody naming can help differentiate the drugs from each other and provide a clue to the drug's target. For example, infliximab contains the inflix *–li–* and the suffix *–mab*. It is a monoclonal antibody that has immunomodulating properties. Abciximab contains the inflix *–ci–* and is a monoclonal antibody that is used to prevent cardiac ischemic complications.

Biosimilar products have a naming convention also. The biosimilar products are required to have a distinguishing suffix with four lowercase letters.[9] Some examples of biosimilar products include infliximab-abda, infliximab-dyyb, and filgrastim-sndz.

Table D-4. USAN STEM List[4,5]

Stem	Prefix, Infix, or Suffix	Definition	Examples
actant	–actant	Pulmonary surfactants	Ber**actant**, calf**actant**, por**actant**
afil	–afil	Phosphodiesterase type 5 (PDE5) inhibitors	Silden**afil**, tadal**afil,** varden**afil**
alol	–alol	Combined alpha and beta blockers	Labet**alol**
andr	–andr–	Androgens	n**andr**olone
anib	–anib	Angiogenesis inhibitors	pegapt**anib**
arone	–arone	Antiarrhythmics	doned**arone**
subgroup	–iodarone	Indicates high iodine content	am**iodarone**
ase	–ase	Enzymes	alglucer**ase**, dorn**ase** alfa
subgroup	–teplase	Tissue-type plasminogen activators	altepl**ase**
ast	–ast	Antiasthmatics (not acting primarily as antihistamines)	
subgroup	–lukast	Leukotriene receptor antagonist	monte**lukast**, zafir**lukast**
subgroup	–milast	Type IV phosphodiesterase	roflu**milas**t
astine	–astine	Antihistaminics (histamine-H$_1$ receptor antagonists)	clem**astine**
azenil	–azenil	Benzodiazepine receptor agonists/antagonists	flum**azenil**
azepam	–azepam	Antianxiety agents (diazepam type)	lor**azepam**, clon**azepam**
bactam	–bactam	Beta-lactamase inhibitors	sul**bactam**
barb	–barb–	Barbiturate derivatives	pheno**barb**ital
caine	–caine	Local anesthetics	dibu**caine**
calci	–calci	Vitamin D analogs	**calci**triol, **calci**potriene
capone	–capone	Catechol-O-methyltransferase (COMT) inhibitors	ente**capone**
cef	cef–	Cephalosporins	**cef**azolin
cept	–cept	Receptor molecules or membrane ligands, native, modified, or synthetic	
subgroup	–bercept	Vascular endothelial growth factor (VEGF) receptors	afli**bercept**
subgroup	–nercept	Tumor necrosis factor receptors	eta**nercept**
subgroup	–tacept	T-cell receptors	bela**tacept**
cillin	–cillin	Penicillins	ampi**cillin**
clidinium	–clidinium Also –ium	Muscarinic receptor agonists/antagonists	a**clidinium** bromide
conazole	–conazole	Systemic antifungals (miconazole type)	flu**conazole**, oxi**conazole**
cort	–cort–	Cortisone derivatives	hydro**cort**isone

Table D-4. (continued)

Stem	Prefix, Infix, or Suffix	Definition	Examples
coxib	–coxib	Cyclooxygenase-2 inhibitors	cele**coxib**
curium, curonium	–curium, –curonium	Neuromuscular blocking agents (quaternary; also ammonium compounds)	cisatra**curium**, ve**curonium**
cycline	–cycline	Antibiotics (tetracycline derivatives)	mino**cycline**
dil	–dil–, –dil	Vasodilators	carve**dil**ol
dopa	–dopa	Dopamine receptor agonists	levo**dopa**
drine	–drine	Sympathomimetics	ephe**drine**
entan	–entan	Endothelin receptor antagonists	bos**entan**
erg	–erg–	Ergot alkaloid derivatives	p**erg**olide
estr	estr–, –estr–	Estrogens	**estr**one
estrant	–estrant	Estrogen antagonists	fulv**estrant**
fenacin	–fenacin	Muscarinic receptor antagonists	dari**fenacin**
fentanyl	–fentanil	Narcotic analgesics (fentanyl derivatives)	al**fentanil**
fo(s)	fos–, –fo–, fos–	Phosphoro-derivatives	**fos**aprepitant, **fos**fomycin, cido-**fo**vir
gab	–gab–, gab–	Gabamimetics	**gab**apentin
gest	–gest–	Progestins	me**gest**rol
giline	–giline	Monoamine oxidase (MAO) inhibitors, type B	sele**giline**
glinide	–glinide	Antidiabetic, sodium glucose co-transporter 2 (SGLT2) inhibitors	repa**glinide**
gliptin	–gliptin	Dipeptidyl aminopeptidase-IV inhibitors	sita**gliptin**
glitazone	–glitazone	Peroxisome proliferator activating receptor (PPAR) agonists (thiazolidinedione derivatives)	rosi**glitazone**
grel	–grel–, –grel	Platelet aggregation inhibitors, primarily platelet P2Y12 receptor antagonists	ana**grel**ide, clopido**grel**, can**grel**or
kinra	–kinra	Interleukin receptor antagonists	ana**kinra**
lutamide	–lutamide	Nonsteroid antiandrogens	bica**lutamide**, f**lutamide**
mab	–mab	Monoclonal antibodies	imciro**mab**
mantadine, mantine	–mantadine, –mantine	Antivirals/antiparkinsonians	a**mantadine**, ri**mantadine**
melteon	–melteon	Selective melatonin receptor agonist	ra**melteon**
mer	–mer	Polymers	cadexo**mer**
nab	–nab–, nab–, –nab	Cannabinol derivatives	dro**nab**inol
nal	nal–, –nal–	Narcotic agonists/antagonists	**nal**mefene, methyl**nal**trexone

Table D-4. (continued)

Stem	Prefix, Infix, or Suffix	Definition	Examples
olol	–olol	Beta-blockers (propranolol type)	tim*olol*, aten*olol*
onide	–onide	Topical steroids	amcin*onide*
orphan	–orphan,–orphan–	Narcotic antagonists/agonists	dextrometh*orphan*, lev*orphan*ol
oxacin	–oxacin	Antibacterials (quinolone derivatives)	ciprofl*oxacin*
oxetine	–oxetine	Antidepressants (fluoxetine-type)	flu*oxetine*
parin	–parin	Heparin derivatives and low molecular weight heparins	he*parin*, dalte*parin*, enoxa*parin*
parinux	–parinux	Antithrombotic indirect selective synthetic factor Xa inhibitors	fonda*parinux*
peg	peg-, –peg–	PEGylated compounds, covalent attachment of macrogol (polyethylene glycol) polymer	*peg*filgrastim, *peg*aspargase
penem	–penem	Antibacterial antibiotics, carbapenem derivatives	imi*penem*, mero*penem*
perone	–perone	Antianxiety agents/neuroleptics	
subgroup	–peridol	Antipsychotics (haloperidol type)	halo*peridol*
subgroup	–peridone	Antipsychotics (risperidone type)	ris*peridone*
pezil	–pezil	Acetylcholinesterase inhibitors for Alzheimer disease	done*pezil*
pin(e)	–pin(e)	Tricyclic compounds	doxe*pin*, amoxa*pine*, carbamaze-*pine*
platin	–platin	Antineoplastics (platinum derivatives)	cis*platin*, carbo*platin*
poetin	–poetin	Erythropoietins	e*poetin* alfa, darbe*poetin* alfa
pramine	–pramine	Antidepressants (imipramine type)	desi*pramine*, imi*pramine*
prazole	–prazole	Antiulcer agents (proton pump inhibitors)	ome*prazole*, panto*prazole*
pred	–pred–, pred–, –pred	Prednisone and prednisolone derivatives	methyl*pred*nisolone, *pred*nisone, *pred*nisolone
pressin	–pressin	Vasoconstrictors (vasopressin derivatives)	desmo*pressin*, vaso*pressin*
pril	–pril	Antihypertensives (ACE inhibitors)	enala*pril*, lisino*pril*
profen	–profen	Anti-inflammatory/analgesic agents (ibuprofen type)	ibu*profen*, keto*profen*
prost	–prost, –prost–	Prostaglandins	dino*prost*
rifa	rifa–	Antibiotics (rifamycin derivatives)	*rif*apentine, *rif*ampin
rozole	–rozole	Aromatase inhibitors	anast*rozole*, let*rozole*
rubicin	–rubicin	Antineoplastic antibiotics (daunorubicin type)	dauno*rubicin*, ida*rubicin*
sal	sal–, –sal, –sal–	Anti-inflammatory agents (salicylic acid derivatives)	difluni*sal*, me*sal*amine, bal*sal*azide

Table D-4. (continued)

Stem	Prefix, Infix, or Suffix	Definition	Examples
sartan	–sartan	Angiotensin II receptor antagonists	lo**sartan**, epro**sartan**
setron	–setron	Serotonin 5-HT$_3$ antagonists	ondan**setron**, dola**setron**
sidone	–sidone	Antipsychotics with binding activity on serotonin (5-HT$_{2A}$) and dopamine (D$_2$) receptors	lura**sidone**, zipra**sidone**
som	som–	Growth hormone derivatives	**som**atropin
statin	–statin	Antihyperlipidemics (HMG-CoA reductase inhibitors)	atorva**statin**, lova**statin**
steride	–steride	Testosterone reductase inhibitors	duta**steride**, fina**steride**
stigmine	–stigmine	Cholinesterase inhibitors (physostigmine type)	pyrido**stigmine**, riva**stigmine**
stim	–stim	Colony stimulating factors	
subgroup	–gramostim	Granulocyte macrophage colony-stimulating factor (GM-CSF)	sar**gramostim**
subgroup	–grastim	Granulocyte colony-stimulating factor (G-CSF)	fil**grastim**
sulfa	sulfa–	Antimicrobials (sulfonamide derivatives)	**sulfa**salazine
taxel	–taxel	Antineoplastics, taxane derivatives	doce**taxel**, pacli**taxel**
tecan	–tecan	Antineoplastics (camptothecin derivatives)	irino**tecan**, topo**tecan**
thiazide	–thiazide	Diuretics (thiazide derivatives)	hydrochloro**thiazide**
tide	–tides	Peptides	octreo**tide**
subgroup	–glutide	Glucagon-like peptide (GLP) analogs	lira**glutide**
subgroup	–paratide	Parathyroid hormone related peptide	teri**paratide**
tidine	–tidine	H$_2$-receptor antagonists (cimetidine type)	cime**tidine**, rani**tidine**
tinib	–tinib	Tyrosine kinase inhibitors	erlo**tinib**
toin	–toin	Antiepileptics (hydantoin derivatives)	pheny**toin**
traline	–traline	Selective serotonin reuptake inhibitors (SSRIs)	ser**traline**
triptan	–triptan	Antimigraine agents (5-HT$_{1B/1D}$ receptor agonists)	suma**triptan**
trop	–trop–, –trop, trop–	Atropine derivatives	a**trop**ine, benz**trop**ine
vin	vin–, –vin–	Vinca alkaloids	**vin**blastine, **vin**cristine

Table D-4. (continued)

Stem	Prefix, Infix, or Suffix	Definition	Examples
vir	–vir–, –vir, vir–	Antivirals	dela**vir**dine, ganciclo**vir**
subgroup	–amivir	Neuraminidase inhibitors	oselt**amivir**, zan**amivir**
subgroup	–cyclovir, –ciclovir	Antivirals (acyclovir type)	a**cyclovir**, fam**ciclovir**, pen**ciclovir**
subgroup	–navir	HIV protease inhibitors (saquinavir type)	indi**navir**, rito**navir**
subgroup	–tegravir	Integrase inhibitors	elvi**tegravir**
subgroup	–virenz	Non-nucleoside reverse transcriptase inhibitors	efa**virenz**
zolamide	–zolamide	Carbonic anhydrase inhibitors	brin**zolamide**

IV = intravenous.

PRONUNCIATION GUIDE

The USAN developed and approved a pronunciation guide to help with pronunciation of drug names. Syllables are based on phonetics. A prime mark (') follows the primary accent syllable, and a double prime mark (") follows a secondary accent syllable. Syllables are separated by a blank space, such as filgrastim (fil gra' stim) and fosaprepitant (fos" a pre' pi tant). Short vowels do not contain any special designations, but long vowels are designated as follows[10]:

- a = ay
- e = ee
- I = eye
- o = oh or oe (if used with a consonant)
- u = ue
- y = ee or eye

Many drug information references incorporate pronunciations and phonetic spelling in their databases. Prescribing information, including patient package inserts and Medication Guides, also lists the phonetic spelling and pronunciation of brand names and/or generic names. Some references have verbal pronunciations, such as drugs.com. **Table D-5** lists common drug names with their phonetic spelling.

Table D-5. Common Drug Names and Their Phonetic Spelling

Generic Name	Phonetic Spelling
Acetaminophen	a seet' a min' oh fen
Albuterol	al byoo' ter ole
Allopurinol	al oh pure' i nole
Alprazolam	al pray' zoe lam
Amlodipine	am loe' di peen
Amoxicillin	a mox i sil' in
Aspirin	as' pir in
Atenolol	a ten' oh lole
Atorvastatin	a tore' va stat in
Azithromycin	az ith roe mye' sin
Bupropion	byoo proe' pee on
Carvedilol	kar' ve dil ol
Citalopram	sye tal' oh pram
Clonazepam	kloe na' ze pam
Clopidogrel	kloe pid' oh grel
Cyclobenzaprine	sye kloe ben' za preen
Duloxetine	doo lox' e teen
Escitalopram	es sye tal' oh pram
Fluoxetine	floo ox' e teen
Fluticasone	floo tik' a sone
Furosemide	fyoor oh' se mide
Gabapentin	ga' ba pen tin
Glipizide	glip' i zide
Hydrochlorothiazide	hye" droe klor" oh thye' a zide
Hydrocodone	hye" droe koe' done
Ibuprofen	eye byoo' proe fen

Table D-5. (continued)

Generic Name	Phonetic Spelling
Insulin glargine	in' su lin glar' geen
Levothyroxine	lee voe thye rox' een
Lisinopril	lyse in' oh pril
Losartan	loe sar' tan
Meloxicam	mel ox' i cam
Metformin	met for' min
Methylphenidate	meth" il fen' i date
Metoprolol	me toe' proe lole
Montelukast	mon te loo' kast
Omeprazole	oh mep' ra zole
Oxycodone	ox i koe' done
Pantoprazole	pan toe' pra zole
Potassium	poe tass' i um
Pravastatin	pra' va stat in
Prednisone	pred' ni sone
Propranolol	proe pran' oh lole
Ranitidine	ra ni' ti deen
Rosuvastatin	roe soo' va sta tin
Sertraline	ser' tra leen
Simvastatin	sim' va stat in
Tamsulosin	tam soo' loe sin
Tramadol	tra' ma dole
Trazodone	traz' oh done
Venlafaxine	ven' la fax een
Warfarin	war' far in
Zolpidem	zol' pi dem

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