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REVIEW

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2023 update to the American College of Clinical Pharmacy Pharmacotherapy Didactic Curriculum Toolkit

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Abstract

The American College of Clinical Pharmacy (ACCP) Pharmacotherapy Didactic Curriculum Toolkit has been used by colleges and schools of pharmacy as a guide for curricular development and revisions since its inaugural publication in 2009. The toolkit was last revised and updated by the 2019 Publications Committee. The 2023 ACCP Publications Committee was charged with reviewing the 2019 Update to the ACCP Pharmacotherapy Didactic Curriculum Toolkit to determine any necessary revisions/updates. The committee revised tier classifications, shifting the focus of the 2023 toolkit to content within the Pharm.D. curriculum. Multiple literature sources were reviewed to assess conditions for inclusion in the 2023 toolkit, and external feedback was solicited from various practice disciplines. All topics were voted on by a simple majority rule during virtual meetings or by electronic votes. There are a total of 231 topics in the 2023 toolkit, a decrease of 77 (23.2%) from the 2019 edition. Topics in each tier are as follows: 68 as tier 1 (29%), 111 as tier 2 (48%), and 52 as tier 3 (23%). Although some topics were removed completely, others were combined with other line items or revised, which may further minimize curricular overload. Similar to the 2016 and 2019 toolkits, many tier 2 topics remain in the 2023 toolkit, emphasizing the continued need for additional training through postgraduate residencies or fellowships (or "on-the-job" equivalent experiences), board certifications, and various certificate training programs. The 2023 ACCP Pharmacotherapy Didactic Curriculum Toolkit is designed to assist individual faculty and colleges and schools of pharmacy with curricular development and revisions. It will continue to be reviewed every

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3 years to identify needed revisions on the basis of the pharmacist's evolving role, advances in therapeutics and pharmacy practice, and changes to accreditation standards and recognized professional competencies.

KEYWORDS
pharmacotherapy, pharmacy curriculum, toolkit

1 | INTRODUCTION

The American College of Clinical Pharmacy (ACCP) Pharmacotherapy Didactic Curriculum Toolkit is intended to serve as a guide to colleges and schools of pharmacy navigating curricular revisions. The inaugural publication of the toolkit was issued in 2009, followed by complete revisions prepared in 2016 and 2019.[1–3] Subsequent to the 2016 update, the ACCP Board of Regents established that the toolkit revision process should occur every 3 years to account for rapid advances in health care and evolving evidence for pharmacotherapy. At the time of writing the current publication, the 2019 toolkit had been cited 46 times and downloaded more than 4000 times, indicating both its value to the College and its need for revisions.

Since the 2019 publication, curricular hoarding has become a topic of concern across many colleges and schools of pharmacy.[4,5] Curricular hoarding is when new content is added to existing curricula without adequately reducing outdated, irrelevant, or otherwise extraneous coursework, which can perpetuate curriculum overload.[4,6] Colleges and schools of pharmacy must work to teach the most relevant and critical diseases, conditions, and treatments at the appropriate depth within the constraints of allotted credit hours. Including all disease states or conditions for which there is an FDA-approved medication in a resource like the toolkit is not only challenging, but also impractical. The need for teaching of specialized pharmacotherapy topics in colleges and schools of pharmacy has further been called into question because of the availability of additional knowledge and training opportunities, including residencies, fellowships, board certifications, and certificate programs for those interested in specialized areas of practice. This edition of the toolkit provides guidance on which disease states to include in a pharmacy school's curriculum and direction on the level of breadth and depth needed to prepare an entry-level, graduating pharmacist.

2 | PROCESS FOR REVISION

The 2023 ACCP Publications Committee was charged with reviewing the 2019 Update to the ACCP Pharmacotherapy Didactic Curriculum Toolkit.[1] The committee was composed of 11 pharmacists, 1 pharmacy resident, and 1 student. Pharmacist members represented diverse areas of expertise on the basis of clinical practice area, geographic location, and teaching experience, including, but not limited to, academia, critical care, drug information, family medicine, and internal medicine. The committee met face-to-face at the 2022 ACCP Global Conference in San Francisco. A designated virtual weekly meeting time was established. A cloud file-sharing folder was created to house resources, minutes, virtual meeting recordings, external feedback, ongoing committee work, and a committee calendar.

The chair assigned topics for the toolkit review on the basis of clinical expertise and teaching experience using information that was solicited before the Global Conference. Areas where expertise was lacking were assigned to members who had been on the 2019 ACCP Publications Committee or on a volunteer basis. The committee performed literature searches and used resources similar to those cited in the 2016 and 2019 toolkits including, but not limited to, national accreditation standards for colleges and schools of pharmacy,[7] licensing examination competency statements,[8] competency areas from residency training programs,[9] pharmacotherapy textbooks,[10–15] related clinical practice guidelines, and literature on disease burden and the pharmacist's role in optimizing pharmacotherapy.[16] All topics were approached with generalist pharmacy practitioners in mind.

Each section of the toolkit was reviewed by a subcommittee composed of at least two committee members before a weekly meeting. Recommendations were collected in a shared spreadsheet that was reviewed by the entire committee. On average, two or three sections of the toolkit were reviewed at each weekly meeting. In addition, all committee members were advised to collect comments/input on the 2019 edition from pharmacists and faculty within their institutions and professional networks. External feedback was collected on a spreadsheet and reviewed during the weekly meetings. All topics were voted on by a simple majority rule during the virtual meetings. There were three meetings when the committee did not have a quorum. Those able to join listened to reviewer comments and shared feedback, all of which were presented in an electronic vote that was conducted by the chair. Thirteen 1-h weekly meetings occurred over a 4-month period. Four additional meetings were deemed necessary by the chair to discuss outstanding reviews. Officers of the ACCP Practice and Research Networks were invited to review and provide input on the updated draft of the toolkit. The final toolkit was reviewed and approved by the ACCP Board of Regents in August 2023.

3 | UPDATED TIER DEFINITIONS

The committee reviewed the competency-based tier definitions from the 2019 toolkit during the face-to-face meeting. The committee discussed the number of topics and concern for curricular hoarding and

the role of the toolkit in curricular evaluation and revision. The primary audience and users of the toolkit were also considered. The committee identified several topics within the 2019 toolkit that required additional training to varying degrees to practice independently or to understand the complexities of disease states. In fact, many accredited postgraduate year 2 (PGY2) residency programs provide topic lists that include highly specialized conditions that may not require a direct patient care experience.[9] Including these conditions in the toolkit could contribute to curricular hoarding. For these reasons, the committee agreed that the 2023 toolkit would focus on content for the Pharm.D. curriculum.

A historical overview of tier designations was reviewed (Table 1), and the committee ultimately determined that updated definitions were necessary to enhance the practicality of the toolkit as well as to mitigate curricular hoarding.[1–3] The committee referred to published models and frameworks that consider the relevancy and criticality to describe a topic as "need to know," "nice to know," or "as needed."[17] The committee commented that this language was helpful but that, if used, many topics would likely be reclassified as tier 1. Further discussions identified the importance of assigning tier 1 classification for conditions in which students receive sufficient knowledge and skills to enable them to be "practice-ready."[7] These conditions are highly prevalent, and pharmacotherapy plays a significant role in management. The committee also discussed that there are prevalent conditions for which students receive foundational knowledge and skills, but additional training is needed in order to be "practice-ready." These would be deemed tier 2. Conditions designated as tier 1 and tier 2 are all topics that should receive sufficient contact time in curricula. Tier 3 conditions are those in which students receive limited education, and substantial knowledge or training is required after graduation to provide person-centered care. Tier 3 conditions may be rare or have a low prevalence and may have limited or no specific treatment, and/or pharmacotherapy may have a limited role. Topics designated as tier 3 are recommended to be included in curricula but have less time or materials devoted to teaching. Although tier 3 from the 2019 toolkit was designed to be comprehensive and would have included these topics, the 2023 committee agreed that any other conditions not meeting the tier designations would not appear in the updated toolkit. Accordingly, topics that instructors may view as "elective-only" and that are not covered in the core curriculum are not likely to be found in this version of the toolkit. Although the toolkit is intended to provide guidance, the degree to which tier topics are taught is at the discretion of individual colleges and schools of pharmacy and their faculties.

During the revision process, the American Association of Colleges of Pharmacy published the 2022 Curricular Outcomes and Entrustable

TABLE 1 Historical approach to toolkit tier designations.

2009 pharmacotherapy toolkit	2016 and 2019 pharmacotherapy toolkits	2023 pharmacotherapy toolkit
Tier I: Represented topics that must be covered by all colleges **IA:** Graduates should have received extensive instruction and training in the treatment of the disease state (and any accompanying morbidities) and, by the time of graduation, be proficient in providing care to patients with the disease **IB:** Graduates should have been exposed to the disease state and its treatments in order to have a good understanding of the disease processes and treatments. However, graduates may require additional resources to ensure appropriate treatment outcomes for patients with the disease or should be able to refer the patient to others who can ensure the appropriate treatment outcomes	**Tier 1:** Students receive education and training on this topic to prepare them to provide collaborative, patient-centered care upon graduation and licensure	**Tier 1:** Students receive sufficient education and training on this condition to prepare them to be practice-ready pharmacists providing collaborative, person-centered care upon graduation and licensure
Tier II: Represented topics that should be covered by most colleges	**Tier 2:** Students receive education and training on this topic, but additional knowledge or skills may be required after graduation (e.g., residency training or equivalent experience) to prepare them to provide collaborative, direct patient care	**Tier 2:** Students receive foundational education and training on this condition, but some additional knowledge and/or training will be required after graduation (e.g., residency, fellowship, or other experiences) to prepare them to be practice-ready pharmacists providing collaborative, person-centered care
Tier III: Represented topics that could be covered if time and resources were available	**Tier 3:** Students and residents may not receive education and training on this topic; rather, they will be expected to obtain the required knowledge and skills on their own to provide collaborative, direct patient care if required in their practice	**Tier 3:** Students receive limited education on this condition, and substantial knowledge or training will be required after graduation (e.g., residency, fellowship, or other experiences) to prepare them to provide collaborative, person-centered care

Professional Activities (COEPA).[18] COEPA introduced "person-centered care" to describe pharmacists providing whole-person care to individuals as the medication specialist. It was proposed and agreed on to use the updated terminology in the tier definitions. The committee also addressed that the additional training required to be practice-ready is not limited to traditional residency and fellowship experiences, but also includes equivalent "on-the-job" experiences, board certifications, and various certificate training programs.[19–23]

The committee voted unanimously to approve the following tier designation language for the 2023 update.

> **Tier 1**: Students receive sufficient education and training on this condition to prepare them to be practice-ready pharmacists providing collaborative, person-centered care upon graduation and licensure.
>
> **Tier 2**: Students receive foundational education and training on this condition, but some additional knowledge and/or training will be required after graduation (e.g., residency, fellowship, or other experiences) to prepare them to be practice-ready pharmacists providing collaborative, person-centered care.
>
> **Tier 3**: Students receive limited education on this condition, and substantial knowledge or training will be required after graduation (e.g., residency, fellowship, or other experiences) to prepare them to provide collaborative, person-centered care.

4 | UPDATES TO THE 2019 TOOLKIT

There are a total of 231 topics in the 2023 toolkit (Table 2), a decrease of 77 (23.2%) from the 2019 edition. Topics in each tier are as follows: 68 as tier 1 (29%), 111 as tier 2 (48%), and 52 as tier 3 (23%). Appendix 1 includes topics that were removed. Of note, although certain topics were removed completely, others were retained through combinations or revisions of line items.

4.1 | Comments on removed topics

In most instances, topics involving minimal or highly specialized pharmacotherapy were removed from the toolkit. In addition to pharmacotherapy textbooks, the committee consulted the American Society of Health-System Pharmacists PGY2 competency areas and external feedback from educators and direct patient care pharmacists. Various hematologic disorders, for instance, are PGY2 elective topics and may only receive case-based application if the program's patient population does not support a direct patient care experience.[9] Palliative care and hospice care were also removed from the toolkit. The pharmacotherapy goals of hospice care are captured under toolkit entry "End-of-life care and symptom management." However, palliative care is not limited to terminal illness and should be considered when managing any serious illness because it involves medical decision-making that is based on individual patient needs.

Drug-induced diseases and conditions were first introduced in the 2016 version of the toolkit, with a total of 9 appearing in the 2019 edition.[1,2] These topics are usually introduced when discussing a medication that causes the condition, with an explanation of the drug-induced mechanism and adverse effects. Because management of these adverse events is typically limited to dose reduction or removal of the offending agent and provision of supportive care, the committee believed these topics were duplicative with the conditions they caused (e.g., acute kidney injury, heart failure). It was decided to remove all drug-induced diseases and conditions except for selected dermatologic and hematologic conditions for which significant prevention and treatment pharmacotherapy exists. Ultimately, heparin-induced thrombocytopenia, drug-induced hemolytic anemias, Stevens-Johnson syndrome, and toxic epidermal necrolysis were retained.

The committee generally considered it unnecessary to include preventive efforts in the toolkit because they are assumed to be taught under specific disease states. For example, because of changes in aspirin recommendations and the lack of obvious pharmacotherapy, primary prevention of atherosclerotic cardiovascular disease (ASCVD) is assumed to be adequately covered when teaching hypertension, dyslipidemia, tobacco/nicotine use disorder, and diabetes.[24]

Chronic coronary disease, acute coronary syndromes, peripheral artery disease, and stroke should also satisfy the intent of ASCVD secondary prevention. Although some of these topics include acute care management, all topics are likely taught with the inclusion of secondary prevention.

4.2 | Other noticeable changes

The committee also made several modifications to nomenclature for clarity and to reflect updates with modernized terminology. This was addressed with many kidney conditions (formerly renal conditions) according to preferred terminology from the Kidney Disease: Improving Global Outcomes Consensus Conference in 2020.[25] The section addressing individuals older than 65, previously known as *geriatrics*, is now *Older people*, a term adopted by the American Geriatrics Society.[26]

4.3 | Focus on pharmacotherapy

The 2023 toolkit continues to exclude topics under medicinal chemistry, pharmacology, adverse drug events, drug–drug and drug–nutrient interactions, pharmacokinetics, pharmacodynamics, pharmacogenomics/pharmacogenetics, therapeutic drug monitoring, pharmacoeconomics, and integrative and functional medicine. Other specific skills and processes of care such as antimicrobial stewardship (including antimicrobial resistance), patient assessment, digital health tools and other technology used to assist with medication management (e.g., glucose monitoring devices), medication delivery systems (e.g., inhalers, insulin pumps), and other OTC tests and devices are not

TABLE 2 2023 Pharmacotherapy Didactic Curriculum Toolkit.

Tier	Organ systems
Cardiovascular conditions	
1	Arrhythmias, atrial
1	Chronic coronary disease (formerly stable ischemic heart disease)
1	Dyslipidemia
1	Heart failure, chronic
1	Hypertension
1	Venous thromboembolism, prevention, and treatment
2	Acute coronary syndromes
2	Advanced cardiac life support
2	Arrhythmias, ventricular
2	Heart failure, acute decompensated
2	Hypertensive crises
2	Peripheral artery disease
2	Stroke (ischemic, hemorrhagic, and transient ischemic attack)
2	Valvular heart disease
3	Pericarditis
3	Pulmonary hypertension
Dermatologic conditions	
1	Acne vulgaris
1	Dermatitis
1	Wounds, minor (e.g., lacerations, punctures, bites, incisions, abrasions, and avulsions)
2	Alopecia
2	Burn injuries, minor (e.g., sunburn, self-treated burns)
2	Insect bites and stings, prevention and treatment
2	Psoriasis
2	Sun-induced skin disorders, prevention
2	Warts, calluses, and corns
2	Xerosis (dry skin)
3	Stevens-Johnson syndrome, toxic epidermal necrolysis
3	Wounds, major (e.g., pressure ulcers)
Ear, nose, mouth, and throat conditions	
1	Allergic rhinitis
1	Common cold
1	Cough
1	Oral lesions (e.g., cold sores, aphthous ulcers)
1	Otitis externa (e.g., swimmer's ear)
2	Cerumen impaction
2	Xerostomia (dry mouth)
Endocrine conditions	
1	Diabetes, type 2 (including prediabetes)
1	Hypothyroidism
2	Adrenal gland disorders
2	Diabetes, type 1 (including latent autoimmune diabetes)
2	Gender-affirming therapy
2	Hyperglycemic crises
2	Hyperthyroidism

(Continues)

TABLE 2 (Continued)

Tier	Organ systems
2	Male hypogonadism
3	Diabetes secondary e.g., monogenic diabetes syndromes, cystic fibrosis, pancreatitis, organ transplantation)
3	Pituitary gland disorders
GI conditions	
1	Anorectal disorders (e.g., hemorrhoids)
1	Constipation
1	Diarrhea
1	Drug dosing in hepatic dysfunction
1	Gastroesophageal reflux disease (including heartburn)
1	Nausea and vomiting, simple (e.g., acute viral gastroenteritis, overindulgence, motion sickness)
2	Cirrhosis, end-stage liver disease, and complications (e.g., portal hypertension, ascites, varices, hepatic encephalopathy, hepatorenal syndrome)
2	Inflammatory bowel disease
2	Irritable bowel syndrome
2	Metabolic dysfunction-associated fatty liver disease
2	Nausea and vomiting, complex (e.g., postoperative)
2	Pancreatitis
2	Peptic ulcer disease (including stress-related mucosal injury, GI bleeding)
Gynecologic and obstetric conditions	
1	Contraception (including emergency contraception)
1	Drug safety in pregnancy and lactation
1	Menopausal symptoms
2	Diabetes, gestational
2	Hypertensive disorders of pregnancy (e.g., pregnancy-induced hypertension, preeclampsia, eclampsia)
2	Labor and delivery (e.g., labor induction, preterm labor, pain management, postpartum hemorrhage)
2	Menstrual cycle disorders (e.g., dysmenorrhea, menorrhagia, premenstrual dysphoric disorder)
2	Other pregnancy-induced and chronic conditions (e.g., constipation, gastroesophageal reflux disease, nausea and vomiting, UTI)
2	Postpartum depression
2	Pregnancy termination
3	Endometriosis and uterine fibroids
3	Female sexual dysfunction
3	Infertility
3	Polycystic ovary syndrome
Hematologic conditions	
1	Anemias (e.g., iron deficiency, vitamin B_{12} deficiency, folic acid deficiency, chronic disease/inflammation)
2	Heparin-induced thrombocytopenia
2	Sickle cell disease
3	Coagulation disorders (e.g., hemophilia, von Willebrand disease, antiphospholipid syndrome, clotting factor deficiencies)
3	Drug-induced hemolytic anemias
Immunologic conditions	
1	Allergies/drug hypersensitivities (e.g., anaphylaxis)
2	Drug desensitization (e.g., penicillin skin testing)
2	Solid organ transplantation
2	Systemic lupus erythematosus
Infectious diseases and conditions	
1	*Clostridioides difficile* infection
1	Common parasitic diseases (e.g., head and body lice, pinworm)

TABLE 2 (Continued)

Tier	Organ systems
1	Fungal infections, superficial (e.g., vulvovaginal and oral/esophageal candidiasis, dermatophytoses)
1	Immunizations (including travel vaccinations)
1	Influenza viral infection
1	Lower respiratory tract infections
1	Skin and soft tissue infections
1	Upper respiratory tract infections (e.g., otitis media, sinusitis, bronchitis, pertussis)
1	UTIs, uncomplicated
2	Antimicrobial prophylaxis in surgery and other procedures
2	Bloodstream and catheter infections
2	Bone and joint infections
2	CNS infections (e.g., meningitis, encephalitis, brain abscess)
2	Coronavirus disease 2019
2	Fungal infections, invasive (e.g., endemic fungus, cryptococcosis, aspergillosis, hematogenous candidiasis, mucormycosis)
2	GI infections (e.g., infectious diarrhea, enterotoxigenic poisonings)
2	Hepatitis, viral
2	HIV infection (including pre- and postexposure prophylaxis)
2	Infective endocarditis
2	Intra-abdominal infections
2	Opportunistic infections in patients with altered immunocompetence
2	Sexually transmitted infections (e.g., syphilis, gonorrhea, chlamydia, trichomoniasis, human papillomavirus, pelvic inflammatory disease)
2	Tuberculosis
2	UTIs, complicated
2	Viral infections (e.g., varicella, cytomegalovirus, herpes simplex, measles, mumps, rabies)
3	Mycobacterial infections, other (leprosy, nontuberculous mycobacterial infections)
3	Prostatitis
3	Tickborne illnesses (e.g., Lyme borreliosis, ehrlichiosis, Rocky Mountain spotted fever, relapsing fever)
3	Travel medicine (including prevention and treatment)
Kidney, fluid, and electrolyte conditions	
1	Chronic kidney disease, prevention of progression
1	Drug dosing in altered kidney function (excluding dialysis)
1	Electrolyte disorders (e.g., potassium, calcium, phosphorus, magnesium)
2	Acid–base disturbances
2	Acute kidney injury
2	Chronic kidney disease, secondary complications
2	Drug dosing in dialysis
2	Sodium and water disorders (including fluid management)
3	Kidney replacement therapies
Musculoskeletal and connective tissue conditions	
1	Gout and hyperuricemia
1	Osteoarthritis
1	Osteoporosis
1	Soft tissue injuries (e.g., strains, sprains, myalgias)
2	Rheumatoid arthritis
3	Rhabdomyolysis

(Continues)

TABLE 2 (Continued)

Tier	Organ systems
Neurologic conditions	
1	Headache (e.g., tension-type, migraine, cluster)
1	Pain, neuropathic (e.g., diabetic, postherpetic)
1	Pain, nociceptive (acute and chronic)
2	Epilepsy
2	Essential tremor
2	Fibromyalgia
2	Multiple sclerosis
2	Neurocognitive disorders (e.g., Alzheimer disease, vascular dementia, frontotemporal dementia)
2	Parkinson disease
2	Sleep–wake disorders (e.g., narcolepsy, restless legs syndrome, circadian rhythm disorders; see also "Insomnia" in the Psychiatric and Behavioral Conditions section)
2	Status epilepticus
3	Amyotrophic lateral sclerosis
3	Huntington disease
3	Myasthenia gravis
Nutritional conditions	
1	Nutrient deficiency and excess (including vitamins and trace minerals)
1	Overweight and obesity
2	Malabsorptive syndrome (including metabolic surgical procedures)
2	Malnutrition prevention and treatment (e.g., enteral and parenteral nutrition)
Oncologic conditions	
1	Supportive care I (pain, nausea, vomiting, constipation, diarrhea, fatigue, mucositis)
2	Breast cancer
2	Colorectal cancer
2	Gynecologic cancers (cervical, endometrial, ovarian)
2	Leukemias, acute and chronic
2	Lung cancer
2	Lymphomas (Hodgkin lymphoma, non-Hodgkin lymphoma)
2	Melanoma
2	Multiple myeloma
2	Oncologic emergencies (e.g., tumor lysis syndrome, hypercalcemia, coagulopathy, febrile neutropenia)
2	Prostate cancer
2	Supportive care II (e.g., myelosuppression, thrombosis, extravasation)
3	Bladder cancer
3	Germ cell tumors
3	Head and neck cancer
3	Hematopoietic stem cell transplantation, including complications
3	GI cancers, other (e.g., carcinoid, esophageal, gastric, hepatobiliary, pancreatic)
3	Myelodysplastic syndromes
3	Renal cell carcinoma
3	Skin cancer, nonmelanoma (e.g., basal cell carcinoma, cutaneous squamous cell carcinoma)
Ophthalmic conditions	
1	Conjunctivitis (e.g., bacterial, viral, allergic)
1	Keratoconjunctivitis sicca (dry eye syndrome)
2	Glaucoma
3	Bacterial keratitis

TABLE 2 (Continued)

Tier	Organ systems
3	Blepharitis
3	Corneal abrasions
3	Hordeolum (stye)
3	Macular degeneration
3	Retinopathy
Psychiatric and behavioral conditions	
1	Anxiety disorders (e.g., generalized anxiety, panic, social anxiety disorder)
1	Depressive disorders (e.g., major depressive disorder)
1	Insomnia (see other sleep–wake disorders in the Neurologic Conditions section)
1	Opioid use disorder (including opioid withdrawal)
1	Tobacco/nicotine use disorder (including smoking cessation)
2	Alcohol use disorder (including alcohol withdrawal)
2	Attention-deficit/hyperactivity disorder
2	Bipolar disorder (e.g., mania, bipolar depression, maintenance therapy)
2	Delirium/acute agitation (non-critically ill patients)
2	Schizophrenia
2	Trauma- and stressor-related disorders (e.g., posttraumatic stress disorder)
3	Eating disorders (e.g., anorexia nervosa, bulimia nervosa, binge-eating disorder)
3	Obsessive-compulsive disorders
3	Substance use disorders, other (e.g., hallucinogens, stimulants, depressants, performance-enhancing drugs)
Respiratory conditions	
1	Asthma
1	Chronic obstructive pulmonary disease
2	Cystic fibrosis
2	Obstructive sleep apnea
Urologic conditions	
1	Benign prostatic hypertrophy
1	Erectile dysfunction
1	Urinary incontinence (including overactive bladder)
Tier	**Conditions of special populations**
Pediatrics	
1	Dehydration and oral replacement therapy
1	Fever
1	Pain relief
1	Pediatric drug dosing
2	Bronchiolitis (including RSV)
2	Neonatal and pediatric critical care (e.g., apnea of prematurity, bronchopulmonary dysplasia, sepsis, respiratory distress syndrome)
3	Congenital heart disease (including patent ductus arteriosus)
3	Enuresis
3	Nutrient deficiency in infants and children
3	Pediatric advanced life support
Older people	
1	Safe medication use in older people (e.g., tools for improving medication safety [AGS Beers, STOPP/START, STEADI-Rx], drug dosing and monitoring, PIMs, deprescribing)

(Continues)

TABLE 2 (Continued)

Tier	Conditions of special populations
Critically ill	
2	Acute respiratory distress syndrome
2	CNS trauma
2	Pain, agitation, and delirium
2	Respiratory support (including rapid sequence intubation)
2	Sepsis
2	Shock syndromes
3	Burns, major/severe
3	Extracorporeal membrane oxygenation, pharmacologic considerations
3	Mechanical circulatory support devices, pharmacologic considerations
3	Post-intensive care syndrome
3	Subarachnoid hemorrhage, aneurysmal
Terminally ill	
2	End-of-life care and symptom management
3	Medical aid in dying
Tier	**Toxicologic conditions**
1	Acetaminophen toxicity
1	Opioid overdose
2	Anticoagulation overdose and reversal
2	Antidepressant overdose (including serotonin syndrome)
2	Antihypertensive medication toxicity
2	Benzodiazepine overdose
2	Digoxin toxicity
2	Salicylate poisoning
2	Sympathomimetic toxicity (e.g., cocaine, amphetamines, novel synthetic cathinones)
2	Toxic alcohol poisoning (e.g., ethylene glycol, methanol)
3	Anticholinergic toxicity (e.g., atropine, antimuscarinic chemical weapons)
3	Cannabinoid toxicity
3	Cholinergic toxicity (e.g., anticholinesterase insecticides, nerve agent chemical weapons)
3	Envenomations

Abbreviations: PIM, potentially inappropriate medication; RSV, respiratory syncytial virus.

addressed in the 2023 toolkit. The 2023 committee supports the statement made by the 2019 committee, expecting that these excluded topics will be covered in required courses for relevant conditions and disease states. An additional topic removed from the 2023 toolkit is basic life support (BLS). Although training is essential and required before experiential placements, there is no pharmacotherapy in BLS.

4.4 | Current and foreseeable trends in health care advancement

Transgender health, pregnancy termination, and physician-assisted dying first appeared in the 2016 toolkit. These were retained in 2019, and transgender health and physician-assisted dying were renamed as gender-affirming hormone therapy and medical aid in dying, respectively. All three topics were classified as tier 3 in the 2019 toolkit, meaning students and residents may not receive education and training on these topics. Gender-affirming care and pregnancy termination have gained significant attention through political conversations and legislative changes and are areas where pharmacists are involved in person-centered care. A recent commentary examined the gaps in pharmacy practice and research for transgender and gender-diverse (TGD) individuals and explained how pharmacy curricula can incorporate and enhance future and practicing pharmacists' ability to provide high-quality care to TGD individuals.[27] To increase access to medication abortion, the mifepristone risk evaluation and mitigation strategy was modified in January 2023 to allow certified pharmacies to dispense mifepristone if prescribed by a certified prescriber for terminating a pregnancy.[28] These topics are now classified as tier 2, denoting

that all pharmacists should receive foundational education and training on these topics. Medical aid in dying was retained as a tier 3 classification because legal authorization is limited and guidelines to standardize medical aid in dying did not exist at the time of this writing.[29]

Autonomous pharmacist prescribing continues to expand, but what can be prescribed varies greatly from state to state. For example, since 2019, several states have gained direct prescribing authority for HIV pre-exposure and postexposure prophylaxis.[30] The committee considered that the expansion of pharmacist prescribing in this and other areas has been authorized in a limited number of states to date and that, in many cases, pharmacists are required to complete continuing education or training programs in order to meet the criteria for independent prescribing. Therefore, a tier 2 placement was determined to be appropriate at this time.[31]

Colleges and schools of pharmacy may choose to place more emphasis on these topics because of state and regional practices. Future committees should review these topics to ensure appropriate tier classification.

5 | LIMITATIONS

The committee's scope of pharmacy practice was broadly general, with strong representation from ambulatory care and acute care settings. The lack of certain specialties, such as hematology/oncology and infectious diseases, was identified early on, and external input was heavily relied on as described previously. Although the committee relied on multiple objective sources, subjective opinions may have influenced toolkit entries and tier designations. The definition of "practice-ready" is not universal among pharmacists and educators, as recently described by Trujillo and Cain.[5] It may be acceptable for a program to focus only on foundational knowledge and skills. Conversely, a program may seek to provide more advanced or in-depth instruction on certain disease states. The wording used to describe the tiers was designed to emphasize what all student pharmacists should minimally receive, allowing individual institutions and individual faculty to determine when it may be acceptable to move beyond the foundational limits. The committee decided against providing recommendations on content time because they would likely be biased with subjective opinions, and it is difficult to quantify content time solely on the basis of tier levels. For example, a tier 1 topic could require minimal instruction time if treatment is not complex. As stated earlier, regional and global perspectives may dictate topic coverage and prioritization.

6 | CONCLUSIONS

The 2023 Pharmacotherapy Didactic Curriculum Toolkit is designed to be a guide for individual institutions and faculty when teaching the pharmacotherapy of conditions and disease states. It is also useful in curricular design to assist in selecting appropriate topics and the appropriate breadth and depth of content delivery. Several toolkit topics were removed to encourage optimization of curricular efficiencies and minimization of curricular overload. Toolkits should be reviewed every 3 years to identify needed revisions on the basis of the pharmacist's evolving role, advances in therapeutics and pharmacy practice, and changes to accreditation standards and recognized professional competencies.

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CONFLICT OF INTEREST STATEMENT

Denise M. Kolanczyk receives direct royalty payments from McGraw-Hill, has had expenses covered related to meeting and travel for the Illinois Council of Health-System Pharmacists, and is part of the board of directors for the Illinois Council of Health-System Pharmacists. Jennifer L. Rosselli receives direct consulting fees from Medtronic, Inc.; has payments from *Pharmacy Times Continuing Education* and the Association of Diabetes Care and Education Specialists; participates in a Medtronic advisory board and has related meeting expenses covered; and was part of the board of directors for the Illinois Pharmacists Association. All other authors declare no conflicts of interest.

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REFERENCES

1. Flannery AH, Soric MM, Benavides S, Bobbitt LJ, Chan A, Crannage AJ, et al. 2019 update to the American College of Clinical Pharmacy pharmacotherapy didactic curriculum toolkit. *J Am Coll Clin Pharm*. 2020;3(2):455–464. Available from: https://doi.org/10.1002/jac5.1178 (Subscription required)
2. Schwinghammer TL, Crannage AJ, Boyce EG, Bradley B, Christensen A, Dunnenberger HM, et al. The 2016 ACCP pharmacotherapy didactic curriculum toolkit. *Pharmacotherapy*. 2016;36:e189–e194. Available from: https://pubmed.ncbi.nlm.nih.gov/27791276/ (Subscription required)

3. Slain D, Wong-Berringer A, Blake B, Bumgardner M, Rowen R, Schonder K, et al. Pharmacotherapy didactic curriculum toolkit 2009; [about 1 screen]. Lenexa (KS): American College of Clinical Pharmacy; c2009 [cited 2023 Jun 29]. Available from: https://www.accp.com/docs/positions/misc/pharmacotherapytoolkit.pdf
4. Romanelli F. Curricular hoarding. *Am J Pharm Educ*. 2020;84:847714 Available from: https://www.ajpe.org/content/84/1/847714 (Subscription required)
5. Trujillo JM, Cain J. Simplifying the PharmD curriculum: less, not loss. *Am J Pharm Educ*. 2023;87:10029.
6. Organisation for Economic Cooperation and Development (OECD). *Curriculum overload: a way forward*; [about 1 screen]. Paris: OECD Publishing; 2020 [cited 2023 Jun 29]. Available from: https://doi.org/10.1787/3081ceca-en
7. Accreditation Council for Pharmacy Education. Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree ("Standards 2016"). 2016 Jan [cited 2023 Jun 29]. Available from: https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf
8. National Association of Boards of Pharmacy. NAPLEX competency statements. c2021 [cited 2023 Jun 29]. Available from: https://nabp.pharmacy/programs/examinations/naplex/competency-statements-2021/
9. American Society of Health-System Pharmacists. PGY2 competency areas; [about 22 screens]. Bethesda (MD): American Society of Health-System Pharmacists; c2016–2023. [cited 2023 Jun 29]. Available from: https://www.ashp.org/professional-development/residency-information/residency-program-resources/residency-accreditation/pgy2-competency-areas
10. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed., text revision. *DSM-5* Arlington (VA): American Psychiatric Association; 2022.
11. Chisholm-Burns MA, Schwinghammer TL, Malone PM, Kolesar JM, Bookstaver P, Lee KC, editors. *Pharmacotherapy principles & practice*. 6th ed. New York: McGraw-Hill; 2022.
12. DiPiro JT, Yee GC, Haines ST, Nolin TD, Ellingrod VL, Posey LM, editors. *DiPiro's pharmacotherapy: a pathophysiologic approach*. 12th ed. New York: McGraw-Hill; 2023.
13. Krinsky DL, Ferreri SP, Hemstreet B, Hume A, Rollins CJ, Tietze KJ, et al., editors. *Handbook of nonprescription drugs: an interactive approach to self-care*. 12th ed. Washington (DC): American Pharmacists Association; 2021.
14. Loscalzo J, Fauci A, Kasper D, Hauser S, Longo D, Jameson JL, et al. *Harrison's principles of internal medicine*. 21st ed. New York: McGraw-Hill; 2022.
15. Zeind CS, Carvalho MG, Chen JW, Zaiken K, LaPointe T, editors. *Koda-Kimble & Young's applied therapeutics: the clinical use of drugs*. 12th ed. Philadelphia (PA): Lippincott Williams & Wilkins; 2023.
16. National Center for Health Statistics. Health, United States, 2020–2021: annual perspective. Hyattsville (MD); [about 2 screens]. Atlanta (GA): Centers for Disease Control and Prevention; c2023 [cited 2023 Jun 29]. Available from: https://stacks.cdc.gov/view/cdc/122044
17. Longyhore DS, Dixon DL, Noel ZR. A modified approach to setting curriculum boundaries in pharmacy school. *Am J Pharm Educ*. 2018; 82:7010 Available from: https://www.ajpe.org/content/82/9/7010 (Subscription required)
18. American Association of Colleges of Pharmacy. Curricular outcomes and entrustable professional activities (COEPA). 2022 Nov [cited 2023 Jun 29]. Available from: https://www.aacp.org/sites/default/files/2022-11/coepa-document-final.pdf
19. American Pharmacists Association. Certificate training programs; [about 7 screens]. Washington (DC): American Pharmacists Association; c2021 [cited 2023 Jun 29]. Available from: https://www.pharmacist.com/certificate-training-programs
20. American Society of Health-System Pharmacists. Professional certificates; [about 24 screens]. Bethesda (MD): American Society of Health-System Pharmacists; c2020–2023 [cited 2023 Jun 29]. Available from: https://www.ashp.org/professional-development/professional-certificates
21. Association of Diabetes Care and Education Specialists. The BC-ADM credential. Chicago: Association of Diabetes Care and Education Specialists; c2022 [cited 2023 Jun 29]. Available from: https://www.diabeteseducator.org/education/certification/bc_adm
22. Board of Pharmacy Specialties. Content outlines; [about 14 screens]. Washington (DC): Board of Pharmacy Specialties; c2022 [cited 2023 Jun 29]. Available from: https://www.bpsweb.org/specialty-exams/content-outlines/
23. Certificate Board for Diabetes Care and Education. Become certified; [about 1 screen]. Schaumburg (IL): Certificate Board for Diabetes Care and Education; c2023 [cited 2023 Jun 29]. Available from: https://www.cbdce.org/become-certified
24. U.S. Preventive Services Task Force. Aspirin use to prevent cardiovascular disease: US Preventive Services Task Force recommendation statement. *JAMA*. 2022;327:1577–1584. Available from: https://jamanetwork.com/journals/jama/fullarticle/2791399 (Subscription required)
25. Levey AS, Eckardt KU, Dorman NM, Christiansen SL, Hoorn EJ, Ingelfinger JR, et al. Nomenclature for kidney function and disease: report of a kidney disease: improving global outcomes (KDIGO) consensus conference. *Kidney Int*. 2020;97:1117–1129. Available from: https://pubmed.ncbi.nlm.nih.gov/32409237/
26. Lundebjerg NE, Trucil DE, Hammond EC, Applegate WB. When it comes to older adults, language matters: *Journal of the American Geriatrics Society* adopts modified American Medical Association style. *J Am Geriatr Soc*. 2017;65:1386–1388. Available from: https://agsjournals.onlinelibrary.wiley.com/toc/15325415/2017/65/7
27. Abrams LM, Look K, Imhoff L. The importance of providing gender-affirming care in pharmacy practice. *Explor Res Clin Soc Pharm*. 2022; 6:100135 Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9335925/
28. U.S. Food & Drug Administration. Information about mifepristone for medical termination of pregnancy through ten weeks gestation; [about 1 screen]. Silver Spring (MD): Food and Drug Administration; c2023 [cited 2023 Jun 29]. Available from: https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/information-about-mifepristone-medical-termination-pregnancy-through-ten-weeks-gestation
29. Death with Dignity. In your state; [about 1 screen]. Portland (ME): Death with Dignity; c2023 [cited 2023 Jun 29]. Available from: https://deathwithdignity.org/states/
30. National Alliance of State Pharmacy Associations. Pharmacy prescribing: HIV PrEP and PEP; [about 1 screen]. North Chesterfield (VA): National Alliance of State Pharmacy Associations; c2022 [cited 2023 Jun 29]. Available from: https://naspa.us/resource/pharmacist-prescribing-hiv-prep-and-pep/
31. McCree DH, Byrd KK, Johnston M, Gaines M, Weidle PJ. Roles for pharmacists in the "ending the HIV epidemic: a plan for America" initiative. *Public Health Rep*. 2020;135:547–554. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7485061/#:~:text=Pharmacists%20provide%20PrEP%20and%20nonoccupational,at%20risk%20of%20acquiring%20HIV

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APPENDIX 1

Removed topics from the 2019 Pharmacotherapy Didactic Curriculum Toolkit

Cardiovascular conditions
Aneurysm
Aortic dissection
ASCVD, primary prevention
ASCVD, secondary prevention
BLS
Cardiomyopathies
Drug-induced cardiac disease
Myocarditis
Dermatologic conditions
Drug-induced dermatologic disorders (e.g., drug reaction with eosinophilia and systemic symptoms [DRESS], Stevens-Johnson syndrome,[a] toxic epidermal necrolysis[a])
Photoaging (e.g., actinic keratosis, solar lentigines)
Ear, nose, mouth, and throat conditions
Ménière disease
Sialorrhea (excessive salivation)
Sore throat
Endocrine conditions
Drug-induced endocrine disorders
GI conditions
Celiac disease
Drug-induced hepatic disorders
Liver diseases, metabolic (e.g., hemochromatosis, Wilson disease)
Gynecologic and obstetric conditions
Pregnancy (e.g., pregnancy testing, preconception care, nutrition and supplementation, drug dosing, teratogenicity,[a] nausea/vomiting[a])
Hematologic conditions
Aplastic anemia
Disseminated intravascular coagulation
Drug-induced hematologic disorders (excluding HIT)
Hemolytic anemias (e.g., autoimmune, hemolytic uremic syndrome, paroxysmal nocturnal hemoglobinuria)
Platelet disorders (e.g., idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura)
Porphyrias
Thalassemia
Immunologic conditions
Immunodeficiency
Sarcoidosis
Infectious diseases and conditions
Spirochetal diseases (e.g., treponematosis, leptospirosis)
Viral infections, miscellaneous (Zika, West Nile, Ebola, dengue fever)
Musculoskeletal and connective tissue conditions
Familial Mediterranean fever and other hereditary autoinflammatory diseases
Mixed connective tissue disease
Myopathies (e.g., dermatomyositis, polymyositis)

(Continues)

Psoriatic arthritis
Reiter syndrome
Sjögren syndrome
Spondyloarthritides (e.g., ankylosing spondylitis)
Systemic sclerosis
Vasculitides (e.g., polymyalgia rheumatica, giant cell arteritis, granulomatosis with polyangiitis [Wegener granulomatosis])
Neurologic conditions
Autoimmune neurologic disorders, other (e.g., Guillain-Barré, autoimmune encephalopathy)
Bell palsy
Cerebral palsy
Drug-induced movement disorders
Dystonia
Tic disorders (including Tourette syndrome)
Oncologic conditions
Mesothelioma
Myeloproliferative disorders (e.g., polycythemia vera, myelofibrosis)
Pediatric malignancies (e.g., Ewing sarcoma, Wilms tumor, osteosarcoma, rhabdomyosarcoma)
Thyroid cancer
Ophthalmic disorders
Drug-induced ophthalmic disorders
Psychiatric and behavioral conditions
Autism spectrum disorders
Personality disorders
Phobias
Renal, fluid, and electrolyte conditions
Drug-induced renal disorders
Glomerulonephritis
Nephrolithiasis
Nephrotic syndrome
Polycystic kidney disease
Respiratory conditions
Drug-induced respiratory disorders
Interstitial lung disease
Urologic conditions
Interstitial cystitis
Neurogenic bladder
Conditions of special populations: pediatrics
Growth and development
Juvenile idiopathic arthritis
Kawasaki disease
Necrotizing enterocolitis
Conditions of special populations: older people
FRIDs
Geriatric drug dosing and monitoring
Geriatric syndromes (e.g., swallowing issues, gait problems, frailty)
Critically ill
Hemodynamic support
Targeted temperature management with ACLS

Terminally ill
Organ procurement
Palliative care and hospice care
Toxicologic conditions
Disaster/emergency preparedness (e.g., chemical warfare agents)
Heavy metal poisoning (e.g., iron, lead)
Pediatric unintentional exposures
Plant exposures (e.g., hemlock, jimsonweed, nightshade)
Poison prevention

Abbreviations: ACLS, advanced cardiac life support; ASCVD, atherosclerotic cardiovascular disease; BLS, basic life support; FRID, fall risk–increasing drug; HIT, heparin-induced thrombocytopenia.

[a] These topics were retained in the 2023 toolkit.