THIRD EDITION

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Drugs You Need to Know

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To the alumni, present students, and future students of Temple University School of Pharmacy

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A Message from the Authors

The genesis of this text was as a resource for Temple University School of Pharmacy (TUSP) students to prepare for their "Top 200 Exam," which is an exam about highly pertinent facts for frequently prescribed medications that all students in third professional year must pass before beginning the fourth professional year. Before writing earlier versions of this book, faculty at TUSP reviewed many texts, flash cards, and other resources but found none to be an optimal reference for our students' needs. Many texts were extraordinarily detailed or did not emphasize important information clearly and concisely since drugs were included based on sales or volume instead of factoring importance. For the past 15 years at Temple, we have used annually updated versions of this text, and students and faculty have found them to be very helpful resources. The three published editions of this text expand on the original in-house versions by including review questions and key points for each drug and drug class.

We hope that this text will serve as a useful reference for healthcare students and professionals of various disciplines as they learn the most frequently used medications in clinical practice.

Thank you,

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Preface

The primary goal of this text is not to cover every medication available, but to highlight the most commonly prescribed and utilized medications in the United States. These medications and the central issues with their use are essential knowledge for healthcare students prior to initiating their curricular clinical experiences. Focusing on the most commonly prescribed medications should result in the medications of highest importance being included, but it can also result in some inadvertent exclusions, such as for specialty medications and those that are rising in utility.

New to this Edition

In creating the third edition of the text, we reviewed the current usage patterns of medications available in the United States. In doing so, over 100 new drugs and drug products were added to this edition of the text. Specifically, the "Mechanism of Action" section for each drug class was expanded to include more detail. All aspects of each drug and drug class were updated to include new dosage forms, dosing schedules, side effects, drug interactions, and new indications. A final addition is 30 new review questions that were added at the end of every chapter.

Acknowlegements

Over the last 15 years, numerous revisions of this text have been undertaken. We are indebted to the many clinicians and faculty who have assisted in developing and editing this text over the years. We would like to thank all of the section editors, authors, and the following people. Without their assistance, earlier versions of this text could not have been written. These individuals are (in alphabetical order):

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Abbreviations Used in the Text

5-HT_3 receptors	Serotonin subtype-3 receptors
ACC/AHA	American College of Cardiology/American Heart Association
ACE	Angiotensin converting enzyme
ACE-I	Angiotensin converting enzyme inhibitor
ADHD	Attention deficit hyperactivity disorder
AIDS	Acquired immune deficiency syndrome
ALA	Alpha linoleic acid
ALT	Alanine aminotransferase
aPTT	Activated partial thromboplastin time
ARB	Angiotensin receptor blocker
ARDS	Acute respiratory distress syndrome
ASCVD	Arthrosclerotic cardiovascular disease
AST	Aspartate aminotransferase
BAS	Bile acid sequestrant
BMT	Bone marrow transplant
BPH	Benign prostatic hyperplasia
BZD	Benzodiazepine
CABG	Coronary artery bypass graft
CBC	Complete blood count
cGMP	Cyclic guanosine monophosphate
CHF	Congestive heart failure
CIN	Contrast-induced nephropathy
CKD	Chronic kidney disease
ClCrest	Estimated creatinine clearance
CNI	Calcineurin inhibitors
CNS	Central nervous system
COPD	Chronic obstructive pulmonary disease
COX-2	Cyclooxygenase-2
CPK	Creatine phosphokinase
CrCl	Creatinine clearance
CRF	Chronic renal failure
CTZ	Chemoreceptor trigger zone
CVA	Cerebrovascular accident
CYP	Cytochrome P450
DHA	Docosahexaenoic acid
DHEA	Dehydroepiandrosterone
DIC	Disseminated intravascular coagulopathy
DKA	Diabetic ketoacidosis
DMARD	Disease modifying antirheumatic drug
DNA	Deoxyribonucleic acid
DRESS	Drug reaction with eosinophilia and systemic symptoms
DVT	Deep vein thrombosis
eGFR	Estimated Glomerular Filtration Rate
EKG	Electrocardiogram
EPA	Eicosapentaenoic acid
EPS	Extrapyramidal symptoms
ER	Extended release
ESRD	End stage renal disease
FAP	Familial adenomatous polyposis
FDA	U.S. Food and Drug Administration
G6PD	Glucose-6-phosphate dehydrogenase
G-CSF	Granulocyte colony-stimulating factor
GERD	Gastroesophageal reflux disease
GFR	Glomerular filtration rate
GI	Gastrointestinal
GU	Genitourinary
HCT	Hematocrit
HCTZ	Hydrochlorothiazide
HDL	High-density lipoprotein
HFrEF	Heart Failure with Reduced Ejection Fraction
HGB	Hemoglobin
HIT	Heparin-induced thrombocytopenia
HIV	Human immunodeficiency virus
HMG-CoA	Hydroxymethylglutaryl-coenzyme A
HPA	Hypothalamic-pituitary-adrenal axis
IBS	Irritable bowel syndrome
IM	Intramuscular
INR	International normalized ratio
IOP	Intraocular pressure
IR	Immediate release
IV	Intravenous
LDL	Low-density lipoprotein
LDLR	Low-density lipoprotein receptors
LFT	Liver function test
LMWH	Low molecular weight heparin
MAO	Monoamine oxidase
MAOI	Monoamine oxidase inhibitor
MDI	Metered-dose inhaler
MI	Myocardial infarction
MOA	Mechanism of action
MRI	Magnetic resonance imaging
MRSA	Methicillin Resistant *Staphylococcus aureus*
NG tube	Nasogastric tube
NLO	Nasolacrimal occlusion
NMS	Neuroleptic malignant syndrome
NNRTI	Non-nucleoside reverse transcriptase inhibitor
NRTI	Nucleoside reverse transcriptase inhibitor
NSAID	Nonsteroidal anti-inflammatory drug
NTE	Not to exceed
OAB	Overactive bladder
OTC	Over the counter

PBPC	Peripheral blood progenitor cell collection
PCI	Percutaneous coronary intervention
PCP	*Pneumocystis carinii* pneumonia
PCSK9	Proprotein convertase subtilisin kexin type 9
PDE5	Phosphodiesterase type 5
PE	Pulmonary embolism
PI	Protease inhibitor
PPARα	Peroxisome proliferator activated receptors
PPI	Proton pump inhibitor
PSA	Prostate Specific Antigen
PTCA	Percutaneous transluminal coronary angioplasty
PUD	Peptic ulcer disease
RA	Rheumatoid arthritis
RDA	Recommended dietary allowance
RNA	Ribonucleic acid
SCN	Severe chronic neutropenia
SCr	Serum creatinine
SGLT2	Sodium glucose cotransporter 2
SJS	Stevens-Johnson syndrome
SLE	Systemic lupus erythematosus
SSRI	Selective serotonin-reuptake inhibitor
SUB-Q	Subcutaneous
TCA	Tricyclic antidepressant
TD	Transdermal
TG	Triglyceride
TIA	Transient ischemic attack
TLC	Therapeutic lifestyle changes
TMJ	Temporomandibular joint
TNF	Tumor necrosis factor
TPA	Tissue plasminogen activator
UFH	Unfractionated heparin
VKA	Vitamin K antagonist
VLDL	Very low density lipoprotein

Pregnancy Category Information

All medications covered in this text have pregnancy classification information. However, for some of the medications, the current information is the pregnancy category classes that have been in effect since 1980 (i.e., Category A, B, C, D, X).

You will notice that some medications do not utilize the prior system. In 2015, the FDA replaced the former pregnancy risk letter categories with new information to make them more meaningful to both patients and healthcare providers. The FDA received comments that the old five-letter system left patients and providers ill-informed and resulted in false assumptions about the actual meaning of the letters. The new labeling system allows better patient-specific counseling and informed decision-making for pregnant women seeking medication therapies. While the new labeling improves the old format, it still does not provide a definitive "yes" or "no" answer in most cases. Clinical interpretation is still required on a case-by-case basis.

The Pregnancy and Lactation Labeling Final Rule (PLLR) went into effect on June 30, 2015; however, the timelines for implementing this new information on drug labels is variable. Prescription drugs submitted for FDA approval after June 30, 2015, will use the new format immediately, while labeling for prescription drugs approved on or after June 30, 2001, will be phased in gradually. Medications approved prior to June 29, 2001, are not subject to the PLLR rule; however, the pregnancy letter category must be removed by June 29, 2018.

Pregnancy Categories

Category A: Controlled studies in women fail to demonstrate a risk to the fetus in the first trimester (and there is no evidence of a risk in later trimesters), and the possibility of fetal harm appears remote.

Category B: Either animal-reproduction studies have not demonstrated a fetal risk but there are no controlled studies in pregnant women or animal-reproduction studies have shown an adverse effect (other than a decrease in fertility) that was not confirmed in controlled studies in women in the first trimester (and there is no evidence of a risk in later trimesters).

Category C: Either studies in animals have revealed adverse effects on the fetus (teratogenic or embryocidal, or other) and there are no controlled studies in women or studies in women and animals are not available. Drugs should be given only if the potential benefit justifies the potential risk to the fetus.

Category D: There is positive evidence of human fetal risk, but the benefits from use in pregnant women may be acceptable despite the risk (e.g., if the drug is needed in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective).

Category X: Studies in animals or human beings have demonstrated fetal abnormalities, or there is evidence of fetal risk based on human experience, or both, and the risk of the use of the drug in pregnant women clearly outweighs any possible benefit. The drug is contraindicated in women who are or may become pregnant.