Demystifying Drug Dosing in Renal Dysfunction

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DEDICATION

We dedicate this book to our family and friends for all of their support through this process.

To my brilliant and supportive wife, Alissa, and my parents and my brother for all of their support through my education, training, and early career.

- Branden

To my parents and my sister for their encouragement; and to the countless mentors I’ve grown with throughout my career.

- Drayton
PREFACE

Most of the conversations we have with other healthcare professionals when taking care of a patient can be grouped under the general topic of “appropriately dosing a medication.” A goal may be to push the limits to achieve a particular efficacy endpoint for one medication while we may be trying to mitigate the potential adverse effects with another. In most patients with stable end-organ function, these conversations are short and without much controversy. However, the conversations are much juicier and ripe for differences in opinion as the patient complexity increases. An area that has generated the greatest amount of discussion in our practices and the impetus for this book is dosing medications in patients with acute and chronic renal dysfunction to achieve our desired safety and efficacy endpoints.

How will this book help you in your practice?

Whether you are a junior or more seasoned physician, advanced practice provider, pharmacist, or a student or resident in any of these professions, this book will meet your needs through efficient, evidence-based presentation of the data behind dosing recommendations, monitoring parameters, and mitigation of adverse effects for commonly used medications in patients with renal dysfunction in the in- and out-patient settings. We have brought together experts in pharmacy and pharmacology with advanced training and credentials to delve into the most widely prescribed medication classes, complex patient subpopulations, and the commonly used renal replacement modalities in easy-to-read and easy-to-apply manners. Early- and middle-career practitioners will find clinical pearls on most every page that they can incorporate into their practice to improve their patients’ outcomes. Late-career practitioners will find the summary tables to be a significant timesaver and helpful update on dosing and monitoring strategies that have evolved in recent years.

Examples of medication classes and organ systems:

- Analgesics (e.g., opioids, gabapentinoids, muscle relaxants)
- Anti-epileptics
- Anti-infectives (e.g., antibiotics, antifungals, antivirals)
- Cardiovascular (e.g., antiarrhythmics, anticoagulants, antihyperlipidemics)
- Oncology (e.g., alkylating agents, anticoagulants, antihyperlipidemics)
- Psychiatry (e.g., antipsychotics, antidepressants, anxiolytics)

Complex patient subpopulations:

- Chronic kidney disease
- Critical illness
- Pediatrics
- Solid organ transplantation
Renal replacement modalities:
- Continuous and accelerated renal replacement therapies
- Hemodialysis
- Plasmapheresis

How should I use this text to improve my patient care?
This text works on multiple levels to meet practitioners where they are with their previous knowledge of dosage adjustments and monitoring in renal dysfunction for medications, subpopulations, and renal replacement modalities and helps them to extend that knowledge. Practitioners who want to use this text as a quick reference for medication dosing given varying degrees of renal dysfunction and/or use of renal replacement modalities will find cleanly presented and evidence-based tables for each chapter that summarize the data into dosing recommendations. When the desire is to investigate the "why" behind the recommendations or the adverse effects that may develop, the authors have thoughtfully reviewed and presented the available data in a referenced and straightforward manner that will leave the practitioner with a deeper understanding of the nuances considered when developing their recommendations.

How confident should I be in this text and the recommendations presented?
The authors for each chapter are expert in their areas, have practiced for years in multidisciplinary practice settings, and in most instances contributed to the peer-reviewed literature used as references in each chapter. All chapters underwent significant peer review by other experts in the specialty areas to ensure the evidence, which in many instances is limited and controversial, is presented in the most responsible ways possible and recommendations are as confident and evidence-based as the data allow.

We are proud of this text, while humbly acknowledging that providing patient care for those with renal dysfunction is complex and best practices continue to evolve over time. We believe this text will be a resource for early-, middle-, and late-career practitioners in medicine and pharmacy. If you have ideas for ways to improve the text in the future so that you and others can provide the best care for patients with renal dysfunction, please do not hesitate to contact us with your ideas.

Branden D. Nemecek and Drayton A. Hammond
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