A Case Approach to Perioperative Drug-Drug Interactions

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Springer

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Foreword

Drug–drug interactions (DDIs) comprise a category of medical mysteries that are, to say the least, perplexing to anesthesia providers. Despite their very real potential to cause major morbidity and even death to patients, they have generally failed to generate the sizzle of recognition associated with major discoveries in medicine. Why is this? Is it because the potential numbers of DDIs are too large or perhaps too ill-defined to stimulate anesthesia providers to care? Is it because we don't have sufficient epidemiologic studies to document the extent and severity of DDIs? Do they cause harm that is observed by individual providers so infrequently that they don't generate interest in learning about them?

All of these issues may be at play, but I suspect that many trainees and colleagues in anesthesia find there are so many hypothetical DDIs – and they personally observe any bad outcomes so infrequently – that they don't put effort into learning about them except to superficially be aware of the general concept. Is my observation real or perceived? It's hard to say for certain, but let's take the example of herbal medications and potential DDIs. Most anesthesia providers are aware that there are herbal medications that can alter drug metabolism. Ironically, because most anesthesia providers don't observe significant DDIs associated with these medications, few pay much attention to them. When major DDIs associated with herbal medications occur, they often are surprising to anesthesia providers, and more often than not, these events are written off as rarities that the providers will likely never again encounter.

I believe that past perceptions will change. DDIs matter, and they will matter more as the medical world advances. More drugs and herbal products lead to more potential DDIs. Emerging technologies and the growing spread of integrated health care-related electronic medical records offer opportunities to incorporate algorithms and other software identification pathways to warn unsuspecting anesthesia providers of potential DDIs. It would be so simple to have an electronic screen warning displayed whenever a potential DDI-associated medication was part of a patient's care.

Even in this advanced health care world, anesthesia providers will have to be able to understand basic DDI issues. That's where this wonderful new text becomes

valuable. The unique use of case studies and subsequent detailed chapters provide anesthesia providers with several ways, both entertaining and scientific, to learn more about these increasingly important DDI issues. Ultimately, the outcomes of our patients are at stake, and the safe care of our patients is why we are anesthesia providers. Congratulations to the team for putting together such an outstanding and valuable resource for our patients and their providers.

Mark A. Warner, MD

Preface

What do you want me to do?

To watch for you while you're sleeping?
Well please don't be surprised
When you find me dreaming too.

—Robert Hunter

Anesthesia providers rest their notion of safe, quality care on constant and inquisitive vigilance. In the operating room, we react and change anesthetic parameters to subtle changes in the pitch of the pulse oximeter signal, the sound of the ventilator or respiratory circuit, the look of the blood in the surgical field, the tone of voice around the operating table, or any other of a thousand cues in a complex environment. We believe that this attention to detail serves our patients and improves outcomes, and we fear missing something big – metaphorically, being caught sleeping.

Yet those of us who have focused on the perioperative implications of drug–drug interactions (DDIs) frequently describe our introduction to the field as having our eyes opened, of being "turned on" to something new and important. Although DDIs occur frequently in both inpatients and outpatients and are often morbid or even mortal, most of us rely daily on knowledge of pharmacodynamic interactions (eg. two drugs affecting the same receptor) and rarely consider DDIs as potential sources of harm to the patient.

It is time for all of us to wake up to DDIs. Indeed, in this era of 80-hour workweeks for medical trainees, many of us owe our arousability to a single DDI. The phenelzine-meperidine DDI that killed young Libby Zion directly led to the adoption of work hour restrictions – and better sleeping and waking for a generation of resident physicians.

We hope this book will be a gentle, comprehensive introduction to an important concept. We have chosen a case-based format to introduce potentially dry concepts, with each case backed by referenced discussion and take-home points. None of the cases presented here are based on hypotheticals from *in vitro* data alone. Particularly

severe interactions are highlighted as the "**Fatal Forty**." In addition, however, detailed mechanistic chapters cover important concepts in depth, offering a second level of knowledge for the interested reader. Finally, comprehensive tables are clearly separated from the text and easily found in the back of the book, allowing use of this book as a reference as well. If you just want to get started now, flip to the cases and read at random. I am confident they will pique your curiosity and start you on a path. If not, there is a more comprehensive "how to use this book" chapter immediately following this preface. Regardless of how you use the book, we welcome you to a fascinating and complex new world and wish you and your patients pleasant awakenings.

Michael P. Hutchens, MD

Acknowledgments

This book is being given as a gift to the Foundation for Anesthesia Education and Research (FAER) and to the national and international anesthesia communities. It is our belief that increased awareness, knowledge, and insight regarding the drug–drug interactions we face in the practice of anesthesiology and perioperative medicine will result in safer and better care for patients.

The project has required an enormous and sustained effort. Many individuals, including anesthesiologists, anesthetists, pharmacologists, pharmacists, and other clinicians, have generously given their time and energy to research and write the case scenarios. We are grateful for these contributions.

Among our colleagues, we must, first and foremost, acknowledge and thank our students, residents, and other junior colleagues for their interest, enthusiasm, and discipline. They were the inspiration that drove this project. We also acknowledge the Cardiac and Surgical Intensive Care Unit (8CSI) at Oregon Health & Science University for their never-ending and driving curiosity.

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Catherine Marcucci, MD

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Part XII. Drug–Drug Interactions Involving Cardiovascular Medications

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