# PHARMACEUTICAL CALCULATIONS

version 0.8

SEAN E. PARSONS, CPHT

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Parsons Printing Press
328 Janice Drive
Pittsburgh, PA 15235
sean@pharmaceuticalcalculations.org

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# PREFACE

The purpose of creating Pharmaceutical Calculations is to provide instructors, students, pharmacy technicians, or anyone else even interested with a math book that offers better flexibility and affordability than any other text book you might find. By making it available in a modifiable electronic format with a license that guarantees your rights, you have the freedom to use this textbook for any purpose, the ability to adapt the book to your needs, the freedom to improve the book and release those improvements to the public, and the freedom to use this book to help your neighbor.

I do request a $15 donation for each person you provide this book to, but honestly that is up to you and your school to collect that donation. I will not show up at your front door demanding payment, I will not accuse you of cheating me, and I will not create a website where I bash your name. That request for a donation is simply to help me supplement all the time and effort that I have placed into writing and updating this book.

I honestly hope that this textbook becomes the best math book you ever teach/learn pharmacy math from, and with your help this book can achieve such a lofty goal.

## INTRODUCTION

I have broken this book up into four sections, *Basic Arithmetic*, *Basic Pharmacy Math*, *Community Pharmacy Math*, and Institutional *Pharmacy Math*.

- *Basic Arithmetic* is intended to reintroduce the students to some basic math concepts and get everyone on the same page. It includes things such as Roman numerals, decimals, fractions, percentages, 24-hour time, exponents, scientific notation, and basic problem solving methods.
- *Basic Pharmacy Math* provides an introduction to converting between different temperature scales, the household system, the metric system, the apothecary system, some basic terminology, some fairly simple work with providing 24 hour supplies of medication, drip rates, and even some percentage strength problems, and dilutions.
- *Community Pharmacy Math* will teach some compounding math and how to bill for those compounds, days' supply, par levels, percent mark-up, and third party insurance billing and other concepts related to pharmacy business math.
- *Institutional Pharmacy Math* will teach basic parenteral dosage calculations, insulin dosing, how to calculate milliMoles, milliEquivalents, and how international units are derived. It will also teach drug reconstitution, percentage strength, milligram percents, ratio strength, parts, reducing and enlarging formulas, dosage calculations based on body weight, dosage calculations based on body surface area, carboplatin dosing, infusion rates and drip rates, dilutions and alligations, parenteral nutrition, aliquots and double aliquots, pediatric and geriatric dosing.

Upon completion of this book, a student should be well prepared for the calculations expected of a pharmacy technician.

# ACKNOWLEDGEMENTS

With any book, an author has to make a large sacrifice of time, and the people that suffer most dearly are his loved ones. In this particular case I want to let everyone know how much I love and adore my wife Shannon and my daughter Sammantha, without either of which this book would have been impossible. I also want to thank my supervisor Connie Geiger, whom never seemed bothered by how much effort I placed into this book. I should also thank Bidwell Training Center for offering me a job to teach pharmacy math (if I had never been offered this job, I am pretty sure I wouldn't have written a math book).

My students also deserve a lot of *'props'* for all their initial encouragement that made me consider even writing a book, and their willingness to function as guinea pigs as I tested my hair brained ideas on how to teach pharmacy math. In that same vein I also want to thank Barb Snyder and my other coworkers for their continued encouragement throughout this whole process.

Last, but certainly not least, I want to thank everyone whom has ever sent me or ever will send me an edit to improve this book. I feel that this book, created along with the collaborative efforts of others is an example of the direction that the text book industry will need to move to keep up with the rapid advancements of science and technology.

*Sincerely*
*Sean E. Parsons*

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