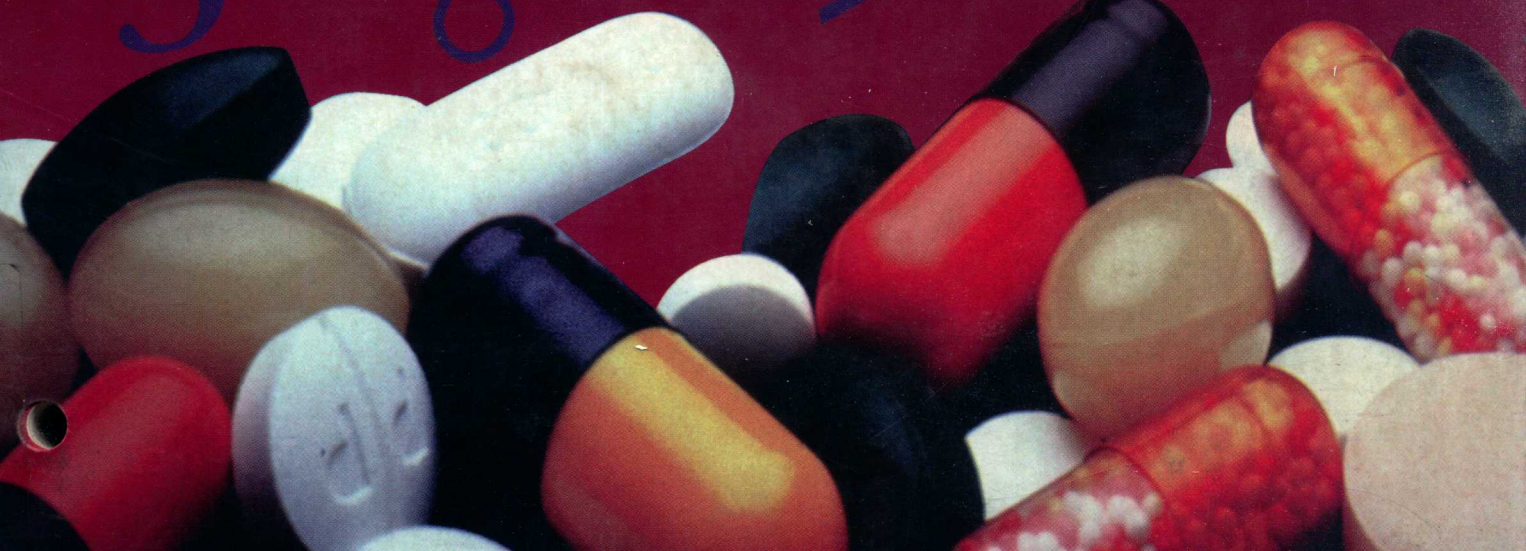
RADCLIFF & OGDEN'S

CALCULATION OF DRUG DOSAGES

An Interactive Workbook

SIXTH EDITION

Sheila J. Ogden



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To
my children—John, Amy, and Justin—
for your patience and understanding
and

To
David—my husband, best friend, and love—
for his ever constant support, without which the project
could not have been completed.
S.J.O.

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Preface

This workbook was designed for students in professional and vocational schools of nursing and for nurses returning to practice after being away from the clinical setting. It can be used in the classroom or for individual study. The workbook contains an extensive review of basic mathematics to assist students who have not mastered the subject in previous educational experiences. It can also be used for those who have not attended school for a number of years and feel deficient in mathematics. It may be that a person has not needed mathematics. Today we are very dependent on modern technology; a calculator is used in most activities involving numbers.

To become skilled in mathematics, extensive practice is necessary. Each chapter begins with a pretest for evaluating present skills. Learning objectives are listed so the student will know the goals that must be achieved, the subject matter is introduced, and examples for solving the various types of problems are provided. Work sheets give the student an opportunity to practice solving realistic problems. Two tests evaluate the student's learning. The student skilled in mathematics can easily adapt to applying the skills to solving problems of drug dosages.

The sixth edition of this workbook retains many important features of the fifth edition such as the mathematics pretest and posttest in Part I.

Part II continues to begin with use of the metric system that is predominant in the medical field. The apothecaries' system is still used and must also be learned. These chapters remain separate because each system must be learned separately before it can be manipulated in conversions.

Part III emphasizes interpretation of the physician's orders and how to read drug labels. The actual number of drug label reprints has been increased in all of the chapters dealing with the calculation of drug dosages. Dosages measured in units and intravenous flow rates have been expanded. The chapter on pediatric dosages includes calculations related to body surface area. Two new chapters have been added. Chapter 15 covers a new method of performing calculation of drug dosages. Chapter 16 introduces the use of the automated drug dispensing system. With the aging of the general population as a concern, the chapter on special considerations for the elderly has been enhanced. Further the home care considerations chapter has been expanded and chapters have been added on dimensional analysis and automated medication dispensing systems. All problems relating to drug dosages continue to represent actual physicians' orders in various health care settings in Indianapolis, Indiana.

In conclusion, a comprehensive posttest has been provided for the student. The questions asked help the student assess total learning of the process of calculation of drug dosages. A Glossary has been included to define important terms.

I want to thank the following pharmaceutical companies that have allowed us to use their medication labels in the book to provide a more realistic representation of medication administration.

Adria Laboratories (Erbamont Inc.)
Beecham (SmithKline Beecham Pharmaceuticals)
Boots Pharmaceuticals, Inc.
Bristol (Bristol-Myers Squibb Company)
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Wyeth-Ayerst Laboratories (American Home Products Corporation)

I appreciate the physicians, nurses, pharmacists, and representatives of various health care agencies who took time to discuss topics with me. I am grateful to my students, from whom I have learned so much. They have helped me understand the problems students have with basic mathematics as well as with the calculation of drug dosages. I hope this book will provide its readers with a feeling of confidence when working with a variety of mathematical problems.

Sheila J. Ogden

Introduction

The purpose of this book is to provide the student in a school of nursing with a systematic review of mathematics and a simplified method of calculating drug dosages.

To attain the maximum benefit from this workbook, begin at the beginning and work through the book in the order presented. Extensive practice is essential for mastery of mathematics.

Each chapter in Parts I and II begins with a pretest to evaluate previous learning. If the grade on the pretest is acceptable (an acceptable score is noted at the top of the test), you may continue to the pretest in the next chapter. If the score on the pretest indicates a need for further study, read the introduction to the chapter, study the method of solving the problems, and complete the work sheet. If you have difficulty with a problem, refer to the examples in the introduction.

On completion of the work sheet, refer to the Answer Key to verify that the answers are correct. Rework all the incorrect problems to find the error. It may be necessary to refer again to the examples in each chapter. Take posttest 1, and grade the test. If the grade is acceptable, as indicated at the top of the test, continue to the next chapter. If the grade is less than acceptable, rework all incorrect problems to find the error. Review as necessary before completing posttest 2. Again verify that your answers are correct. At this point, if you have followed the system of study, the grade on the second posttest should be more than acceptable. Follow the same system of study in each of the following chapters.

When all the chapters in the workbook are completed with acceptable scores (between 90% and 100%), you should be proficient in solving problems relating to drug dosage; more importantly, you will have completed the first step toward becoming a safe practitioner of medication administration.

On completion of the materials provided in this workbook, you will have mastered the following mathematical concepts for the accurate performance of computations:

1. Solve problems using fractions, decimals, percents, ratios, and proportions
2. Solve problems involving the apothecaries', metric, and household systems of measurements
3. Solve problems measured in units and milliequivalents
4. Solve problems related to oral and parenteral dosages
5. Solve problems involving intravenous flow rates
6. Solve problems confirming the correct dosage of pediatric medications
7. Solve problems by use of the dimensional analysis method

You are now ready to begin Chapter 1.

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Part I Review of Mathematics

Chapters

PRETEST

Name _____

Date _____

ACCEPTABLE SCORE 68

YOUR SCORE _____

Directions: Add and reduce fractions to lowest terms.

1. $\frac{3}{8} + \frac{1}{3} =$ _____

2. $2\frac{3}{7} + 1\frac{2}{3} =$ _____

3. $\frac{4}{5} + \frac{5}{9} =$ _____

4. $1\frac{3}{5} + \frac{7}{8}/\frac{1}{3} =$ _____

Directions: Add the following decimal fractions.

5. 1.03 + 2.2 + 1.134 = _____

6. 30.962 + 0.57 + 2.3 = _____

7. 6.88 + 4.5 + 1.678 = _____

8. 1.479 + 28.68 + 4.5 = _____