5.1: Math Calculations Introduction

Learning Objectives

- Accurately perform calculations using decimals, fractions, percentages, ratios, and/or proportions
- Convert between the metric and household systems
- Use military time
- Use dimensional analysis
- Accurately solve calculations related to conversions, dosages, liquid concentrations, reconstituted medications, weight-based medications, and intravenous infusions and evaluate final answer to ensure safe medication administration

The Institute of Medicine (IOM) has estimated that the average hospitalized patient experiences at least one medication error each day. Nurses are the last step in the medication administration process before the medication reaches the patient, so they bear the final responsibility to ensure the medication is safe. To safely prepare and administer medications, the nurse performs a variety of mathematical calculations, such as determining the number of tablets, calculating the amount of solution, and setting the rate of an intravenous infusion. [1]

Dosage calculation in clinical practice is more than just solving a math problem. Nurses must perform several tasks during drug calculations, such as reading drug labels for pertinent information, determining what information is needed to set up the math calculation, performing the math calculations, and then critically evaluating the answer to determine if it is within a safe dosage range for that specific patient. Finally, the nurse selects an appropriate measurement device to accurately measure the calculated dose or set the rate of administration. [2] This chapter will explain how to perform these tasks related to dosage calculations using authentic problems that a nurse commonly encounters in practice.