How Math Is Used When Caring for Patients

Math skills and knowledge are used in MLT and nursing classes, at clinical sites and in the lab, and when taking licensing exams; however, many students don’t realize how critical they are and how often they are used. Clinical lab technicians use math calculations when running tests in the lab, and nurses use addition, fractions, ratios, and algebraic equations to deliver the right amount of medication to their patients (Boyd, n.d.). Both use math to help monitor changes in a patient’s condition. Given this, are you prepared to do the math you need to do?

MLTs and Math

MLTs use math related to solutions and their concentrations when running lab tests; buffers, reaction mixtures, cell culture media, cell lysates, liquid acids and bases are all examples of solutions commonly used in the lab. According to Ryan (n.d.), liquid solutions can be diluted by using a solvent to increase the volume of a solution and thus decrease the concentration of that solution. For instance, MLTs may need a small volume of a low concentration solution; when doing the math they need to weigh out microgram or nanogram amounts of the compound. In cases like this where lab balances are not able to measure this amount, you’ll need to make a higher concentration solution, and then dilute it to the concentration you need (Ryan, n.d.). Doing this obviously requires the use of math and precise measurements. MLTs also need to be very familiar with exponents, the metric system, and scientific notation.

Nurses and Math

Along with using math for calculating correct medication dosages, nurses sometimes calculate a patient’s intake and output or the number of calories a patient has consumed in a day. Measurement conversions, IV drip rates, and drug titrations may also need to be determined, and they all need to be done correctly. Administering an incorrect amount of a drug may cause serious complications and can even be fatal. When someone’s life is in their hands, it’s critical that nurses compute drug dosages accurately.

Calculating measurement conversions is something that nurses must also do. Measurements are based on the metric system, so “to provide safe care, pounds must often be converted to kilograms, ounces to cubic centimeters, Fahrenheit to Celsius, and inches to centimeters” (Boyd, n.d., para. 3). Additionally, some medications are prepared through mixing or reconstitution before being administered, “so nurses must be able to calculate how much of each to mix in order to make the medication the correct strength” (Mahuron, n.d., para. 5).

Nurses are involved in administering intravenous (IV) medication or solutions to patients as well. “Nurses need to know the amount of medication the patient is to receive, the overall time period for administering it, and how much medication will be given each hour. They use the information that is known to calculate the rest. Nurses generally calculate the flow rate or drip rate of the IV, determining the exact amount of medication the IV fluid should deliver to the patient during specified intervals” (Mahuron, n.d., para. 4). This is a critical skill as well.
To safely care for patients, nurses and MLTs must know how to correctly calculate the math problems they encounter in their work day. Nurses will have to determine drug dosages, IV drip rates, and drug titrations; perform measurement conversions; and mix or reconstitute medications correctly. Doing so carefully and precisely will prevent unintentional medication errors and potentially a patient’s death. MLTs must use math accurately in their lab work to correctly diagnose and monitor a patient’s condition.

Math Review Resources and Tutoring Can Help

There are many resources in the library on the MTH101 page (on the Course Help tab), the Math & Dosage Calculation Review Resources page (on the Study Help & Review Resources tab), and on the Math Resources page (on the Medical Lab Technology tab) to help you learn and review the math necessary for safe patient care. These resources include games, quizzes, videos, and practice tests as well as information on decimals, rounding, military time, metric conversions, formulas for IV pump and gravity drip calculations, maintenance fluid rate calculations, epidemiological formulas, algebra, scientific notation, and other math-related content.

Math tutors are available on each campus and online to help as well. Check the Tutoring and Office Hours schedules on the Tutoring tab in the library for their availability.

It’s a good idea to refresh your memory before heading into a test or a clinical or work environment, and these resources can help you do so.

MLT students can find resources to help them learn and review the math they need on the Math Resources page on the Medical Lab Technology tab, as well as on the other 2 library pages.

Nursing students can find resources to help them learn and review the math they need on the MTH101 page on the Course Help tab and the Math & Dosage Calculation Review Resources page on the Study Help & Review Resources tab.

Algebra help is available on the MTH205 page on the Course Help tab and the Math & Dosage Calculation Review Resources page.

References

