Why Nurses Need Math and English

Students sometimes wonder why they need to take Math and English classes and how these subjects fit into every day nursing. A main reason is that a certain level of English and math proficiency is necessary for academic success in nursing school as well as for patient safety in the clinical and work environment. Math formulas are used by nurses to determine how much medication to administer as dosages must be customized to each patient. English is a part of a nurse’s daily spoken and written communication and becomes part of a patient’s medical record. You’ll find here more reasons why these subjects are necessary for nursing students to take and excel at.

HOW MATH IS USED BY NURSES

Nurses use math to make sure the medication amount given to a patient is appropriate and that patients do not receive too little or too much. A guess or approximation is not good enough when someone’s life is on the line. Knowing how to calculate drug dosages will help prevent unintentional medication errors which account for hundreds of patients’ deaths each year.

Medication Dosage
Since administering an incorrect amount of a drug can cause serious problems and sometimes be fatal, it’s critical that nurses flawlessly calculate drug dosages. They do so by using math formulas to determine how much medication a patient should be given whether it be oral drugs, injectables, IVs, or ointments. So, nurses use math to calculate how much medicine to give, based on the dose and how much the patient needs (Mahuron, n.d.).

Measurement Conversion
Nurses must be skilled in calculating conversions as well. Medication doses need to be consistent, whether administered using the metric system, the apothecary system, or using home measurements. Nurses must recognize these measurement systems and be able to accurately convert one measurement to another. They do this by knowing conversion tables by memory and by knowing how to calculate a conversion using the least number of steps (Mahuron, n.d.).

IV Dosage
Medication or solutions are often administered to patients by intravenous (IV) therapy. 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.).

Mixing Solutions
Some medications must be prepared by a nurse before being administered. An example is medication that requires reconstitution. In this case, medication is stored in one strength or consistency and then has to be reconstituted to a diluted form or liquid suspension. The medicine is called the solute, which is then mixed with a solvent. Nurses must be able to calculate how much of each to mix in order to make the medication the correct strength (Mahuron, n.d.).

HOW ENGLISH IS USED BY NURSES

Nurses have to have an understanding of basic language skills along with knowledge of thousands of medical terms. They communicate with patients and physicians and must be able to go from medical speech to speaking to their patients in easy to understand sentences. This is critical to patient education and also to understanding a patient’s needs. A nurse’s documentation must be literate and concise enough for the next shift to understand and for legal purposes.
As nurses, you’ll be required to do quick but accurate writing when filling out reports and charts correctly and completely and recording your interactions with doctors and patients. Since a patient’s health care record is a legal document, it’s critically important that documentation is clear, concise, accurate and complete. You must always be prepared to defend the information you record. Tompkins, Tompkins, and Angeli (2012) have compiled three general rules and examples of each to illustrate this type of writing both in school and in the field. They are:

1. **Be Precise**
   - Remember that accuracy is important even beyond the obvious areas like medication administration and treatment procedure. Accurately reporting sequences of events, doctor’s orders, and patient concerns will protect you from scrutiny.

   **Example**
   - “Did dressing change.”
   - “Performed dressing change, cleaned wound with NS and gauze, applied calcium alginate, covered with ABD, secured with silk tape. Patient tolerated well.”

   **Comment**
   - If this is the entire record of you performing a dressing change for a patient, then exactly what you did is up to interpretation.
   - This precise revision provides a clear picture of every step of the procedure and explains use of all materials. (Note: even further explanation may be necessary to describe wound status and any changes or doctor notifications.)

2. **Be Objective**
   - Always try to remove personal emotions and opinions from the writing you do. Place yourself in a dispassionate mindset and record information, not feelings, hunches, or viewpoints.

   **Example**
   - “Patient acting crazy.”
   - “Patient pacing back and forth, breathing fast, clenching fists, yelling ‘Don’t touch me!’ repeatedly.”

   **Comment**
   - This statement relies on the nurse’s subjective opinion of the patient’s mental state.
   - This provides a clear picture of what actually happened during the incident, allowing the reader to draw his or her own conclusions.

3. **Remember Your Critical Audience**
   - Litigation and auditing are a fact of life in the medical field, and chances are good that readers of your writing may be actively looking for mistakes or inconsistencies. Scrupulous charting and reporting is the best way to satisfy such readers. If a nurse records in her notes “Did dressing change. Patient acting crazy.” the statements could be used by a critical audience to have cause for correction or could be used negatively against her in court. The phrase “Did dressing change” details no necessity for specific materials, leaves room for doubt as to compliance with doctor-ordered treatments, and can provide space for accusations from expert witnesses. Writing “Patient acting crazy,” without quantifying statements and description of your actions, can be grounds for charges of negligence. Either one of these cases, in an extreme scenario, could be grounds for a nurse to lose his or her license (Tompkins, Tompkins, & Angeli, 2012).

   Another reason accurate writing is necessary is for continuity of quality care. When the nurse leaves at the end of her shift, someone else will care for her patient. Quan (n.d.) notes that since other health care providers will rely on this information to make decisions about the patient’s care and needs, a nurse’s writing needs to be specific and factual. She believes that the skill with which you write about your assessment, intervention, and the patients’ outcomes reflects on the quality of the hands-on care you provide. The more detailed the notes, the better the patient can be assessed by someone else.

   Quan (n.d.) gives this example of a description of a patient’s wound. She says you need to represent the five senses to the reader. If a wound is ugly and disgusting, this no doubt conveys a message, but does not accurately describe the wound. The following gives a much clearer description of the wound: “The old dressing was removed. The R hip wound is now 3 cm. by 4 cm. by 0.5 cm. There is 1 cm. strip of yellow slough along the entire right side that is well adhered and pink granulation tissue around the outer edges of the other three sides. There is a slight odor emanating from the slough, but the old dressing has no odor. There is a small amount of serosanguineous drainage on the inner aspect of the dressing. The patient is afebrile and experiences only slight (0–2/10) pain during the dressing change.” You would go on to explain the new dressing procedure and sign your note with your name, credentials, date, and time, according to your facility’s policies.

   These Math and English usage examples show they are essential to what nurses do and how they’re used every day. So, don’t wonder whether these two subjects are important for nursing students, and do your best in each of these classes!

**References**

