



Chemistry in Nursing

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Introduction

Undergraduate students who are looking to go into healthcare have to take chemistry as a prerequisite

There are many different types of chemistry classes

These classes help us see and understand what is happening at a macroscopic level because of interactions at an atomic level

Basic Chemistry

In a basic chemistry class, one of the first things you learn is the metric system and converting to different measurements

For example, if a nurse is told to administer a patient 100 milligrams of a medication and the medication only comes in microgram tablets, the nurse would have to figure out how many tablets to give the patient



Basic Chemistry

- Another example is if a medication is ordered at 500 mg per dose and the strength of the dosage is 150 mg per ml, the nurse must be able to convert that it will be 495 mg per dose
- The equation for this problem would be
$$500 \text{ mg}/1 \times 1 \text{ ml}/150 \text{ mg} = 500 \text{ ml}/150 = 3.3 \text{ ml}$$
$$3.3 \text{ ml} \times 150 \text{ mg per ml} = 495 \text{ mg}$$

Basic Chemistry

Significant digits are also taught in this class, they are used for accuracy in sciences.

The last example was measured in milliliters, with the significant digit rule, volume must be rounded to the nearest tenth.





Organic Chemistry

- Organic chemistry is the study of carbon compounds. Students must be familiar with names, structure, composition and synthesis of carbon compounds.
- Nurses need organic chemistry to know what is happening at a cellular level.
- Organic chemistry is used in nurses to make sure that any medication that is administered will not react to any prescribed medications, allergies, and/or previous medications

Organic Chemistry

- For example, a patient with a heart condition needs medication and a nurse looks at their chart and see that they have a history of psoriasis, the nurse might not give them Amiodarone, Digoxin, Gemfibrozil and Quinidine because these medications may cause a psoriasis flare-up



General Chemistry

- General chemistry is used in healthcare to help diagnose diseases and investigate samples of enzymes, bacteria, blood and more
- An example of this is in a patient with diabetes, glucose will not be seen at a normal level for ATP production, so when glucose is not available, fatty acids will break down to produce energy in place of ATP to produce ketone bodies which leads to ketosis and metabolic acidosis. This starts to affect the bicarbonate buffer system which causes the pH balance to drop. The bicarbonate buffer system is the most important because it maintains the pH and homeostasis of blood. The pH balance of blood should be about 7.35 to 7.45. Acidosis means that the pH balance of the blood is anywhere from 6.80 to 7.35 and this can lead to death (Nivaldo)

General Chemistry

- From the last example, the buffer system will attempt to buffer the excess acid produced in people with diabetes.
- The following is the chemical reaction:



Conclusion

- Chemistry is very intricate and have many different types that would be beneficial for many healthcare professionals to take to be able to understand different parts of the human body and understand what happens at an atomic level. Healthcare professionals use chemistry to better understand the human body and our atomic makeup.



Works Cited

- Georgia Highlands College. (2022, August 22). Libguides: Clinical Calculations: Module 3: The Metric System. Module 3: The Metric System - Clinical Calculations - LibGuides at Georgia Highlands College. Retrieved April 20, 2023, from <https://getlibraryhelp.highlands.edu/c.php?g=937883&p=6759243#:~:text=As%20a%20nurse%2C%20you%20will,will%20be%20easy%20for%20you.>
- How to pass organic chemistry in nursing school: What is Organic Chemistry in nursing school? Registered Nurse RN. (2017, March 15). Retrieved April 20, 2023, from <https://www.registerednursern.com/how-to-pass-organic-chemistry-in-nursing-school-what-is-organic-chemistry-in-nursing-school/>

Works Cited

- Tro, N. J. (2023). Acids and Bases. In *Introductory chemistry* (6th ed., pp. 509–511). essay, Pearson Education, Inc.
- WebMD. (n.d.). *Drugs & medications that can trigger psoriasis flare-ups*. WebMD. Retrieved April 20, 2023, from <https://www.webmd.com/skin-problems-and-treatments/psoriasis/drugs-worsen-psoriasis>
- WebMD. (n.d.). *Drugs & medications that can trigger psoriasis flare-ups*. WebMD. Retrieved April 20, 2023, from <https://www.webmd.com/skin-problems-and-treatments/psoriasis/drugs-worsen-psoriasis>