

# [Exercise 10: acid base balance](https://assignbuster.com/exercise-10-acid-base-balance/)

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## Student instructions:

Follow the step-by-step instructions for this exercise found in your lab manual and record your answers in the spaces below. Submit this completed document by the assignment due date found in the Syllabus. Rename this document to include your first and last name prior to submitting, e. g.

Exercise 10\_JohnSmith. oc. Please make sure that your answers are typed in RED. (You may delete these instructions before submission. ) Grading: True/False, Multiple-Choice, and Fill-in-the-blank type questions will be worth 1 point each whereas Short-answer type questions will be worth 2 points each. This lab will be worth a total of 45 points but will be converted to a percentage grade when registered in your “ Gradebook”.

ACTIVITY

1: Hyperventilation and Answers

A substance that dissolves in water to release hydrogen (H+) ions is a(n) \_\_\_\_\_\_\_. (Acid)

Which of the following is not a regulatory mechanism for acid/base balance in the body? D – Digestive System

* the kidneys
* the respiratory system
* protein buffers
* the digestive system

The maximum pH measured during hyperventilation was \_\_\_\_\_\_\_. (7. 58 )

The tidal volume (TV) when breathing at rest was about \_\_\_\_\_ ml. The TV with hyperventilation was (3 ) about \_\_\_\_\_ ml.

Describe the normal ranges for pH and PCO2 in the blood.

* Min Pco2 – 40 Max Pco2 – 40
* Min pH – 7. 41 Max pH – 7. 41

Describe what happened to the pH and the carbon dioxide in the blood with hyperventilation.

* Min Pco2 lowered to 25. 94 (well below normal)
* Min pH stayed around normal at 7.

Explain how returning to normal breathing after hyperventilation differed from hyperventilation

* With straight hyperventilation, the pH stayed within average.
* without returning to normal breathing.
* the carbon dioxide lowered tremendously.

With the

* Hyperventilation then back to normal breathing the carbon
* dioxide levels did not lower as much and the pH stayed around
* the normal zone as well.

Describe some possible causes of respiratory alkalosis. serious cardiac disorder (ACTIVITY)

2. RebreathingIn cases of acidosis, the pH of the blood is

* C – Less than
* Between and 7. 55
* Between 7. 35 and 7. 45
* Less than 7. 35
* Greater than 7. 5

In this lab simulation, the minimum pH during rebreathing was \_\_\_\_\_\_\_.

* If a person is “ treated” in a hospital emergency department by breathing in and out of a paper

Rebreathing

* sack, this is a classic example of \_\_\_\_\_\_\_\_\_ to lower the blood pH.
* Hypoventilation results in
* C – An accumulation of CO2 in the blood
* lightheadedness.
* numbness around the lips.

Answer: \_\_\_\_\_\_\_\_\_

* accumulation of CO2 in the blood.
* a good treatment for respiratory acidosis.
* Describe what happened to the pH and the PCO2 levels in the blood during rebreathing. | Min pH lowered
* to  Max pH raised
* to Min Pco2 stayed the same at 40 Max Pco2 raised
* to Describe several possible causes of respiratory acidosis. airway obstructions or inadequate ventilation, also possible
* from an overproduction of Pco2
* Explain how the renal system can compensate for respiratory acidosis.
* the renal system compensates by retaining hco3 and excreting
* hydrogen ions

ACTIVITY

3. Renal Responses to Respiratory Acidosis and Respiratory Alkalosis

When carbon dioxide (CO2) mixes with water in the bloodstream, carbonic acid is formed. This

* Hydrogen
* carbonic acid can then dissociate into the \_\_\_\_\_\_\_ ion and the \_\_\_\_\_\_\_ ion.
* Bicarbonate

When more CO2 is produced by the body than can be expired from the lungs, the pH of the blood might

* C - Decrease
* increase
* stay normal
* decrease
* either stay in the normal range or decrease.

True or False:

The renal system is able to fully compensate for acidosis or alkalosis.

* True
* Describe what happened to the concentration of ions in the urine when the blood PCO2 was lowered. H Decreased
* HCO3 Increased

What condition was simulated when the blood PCO2 was lowered?

* Alkalosis

Describe what happened to the concentration of ions in the urine when the blood PCO2 was raised.

* H Increased
* HCO3 Decreased

What condition was stimulated when the blood PCO2 was raised?

* Acidosis

ACTIVITY

4. Respiratory Responses to Metabolic Acidosis and Metabolic Alkalosis

The cellular gaseous waste product than can accumulate in the bloodstream is \_\_\_\_\_\_\_\_\_\_\_\_.

* Carbon Dioxide

In this lab simulation, when the metabolic rate was increased to 80 kcal/hour, the pH of the blood

C – 7. 25; 63 lowered to \_\_\_\_\_\_ because of an accumulation of \_\_\_\_\_\_\_ [H+] in the blood.

When the metabolism was decreased, the number of breaths/minute \_\_\_\_\_\_\_\_\_

* increased, decreased
* decreased
* remained the same

True or False:

In a hospital, the treatments for respiratory acidosis and metabolic acidosis are

* False
* Usually the same because these conditions are so similar.
* Describe what happened to the blood pH when the metabolic rate was increased to 80 kcal/hr.

The blood pH decreased to 7. 26, BPM increased tremendously, PCo2 body system was compensating?

* Also, H increased as well. The HCO3 decreased.
* List and describe some possible causes of metabolic acidosis, i. e. how the acidosis is caused. Keto Acidosis – A buildup of keto acids that result from
* DiabetesMellitus

Salicylate Poisoning – a toxic condition resulting from

* the ingestion of too much aspirin or oil of wintergreen, alcohol
* strenuous exercise
* Describe what happened to the blood pH when the metabolic rate was decreased to 20 kcal/hr.

What body system was compensating?

* List and describe some possible causes of metabolic alkalosis, i. e. how the alkalosis is caused.
* Ingestion of alkali, vomiting, constipation.