**What is pH?**

pH is the measurement used to determine if a solution is basic or acidic. This is done by measuring the degree of concentration or interaction of hydrogen ions in an aqueous solution.

**What is pka?**

The symbol of pKa is usually used in pharmacokinetics as an acid dissociation constant. Meaning pka is more specific as it is a property of the compound as opposed to a solution. This tells us how acidic it is and what it will do at a specific pH. It essentially provides us with knowledge of the pH required for a chemical species to either accept or donate a proton within a solution.

**How are they related?**

The Henderson-hasselbalch equation is used taking into account the pka of a certain drug and the pH of a specific sector within the body. The Henderson-hasselbalch equation can potentially calculate the proportion of a drug that will be absorbed or excreted.

\[
\text{pH} = \text{pK}_a + \log \frac{[A^-]}{[HA]}
\]

The movement of a drug within a body depends on numerous factors such as the pH of the body, the pka of the compound as well as the absorption and excretion rate of the drug. All these factors can potentially play a role in saving someone's life whether it's formulating a drug appropriate for the human body pH or even during a drug overdose.

You must be thinking does she mean pH? No I have spelt it right however very often the measurement of pH can be easily confused to be the exact same as pka. Then we ask what really is pka? What is the use of it? and how can it possibly affect my life?. These are the questions I am here to answer in this blog. To understand pka we need to recognise the difference between pH and pka and how they interconnect to provide an understanding of the absorption and excretion of a drug within the body and how this can potentially save a life!

**Have you guessed it yet?**

It’s pka!
Majority of medications result as a filtered distribution within the bloodstream in order to counteract the symptoms and the disease. For drugs to be excreted from the body they pass through the kidney, specifically the renal tubules. The drug is usually electrically charged throughout the process of administration within the body.

Therefore it is able to leave the body and get rid of the drug. However if the opposite of this happens and the drug is not charged it will bypass the filtration process in the kidney and head straight to the bloodstream which can cause numerous side effects and can be very dangerous to the human body.

In a case of a patient who has overdosed the action plan is usually for the drug to leave the system as quickly as possible. Now lets consider an aspirin overdose. The large amount of aspirin consumed have not been electrically charged as a normal dose of aspirin would.

Regarding the known pka of aspirin to be 3.5 which is considered a weak acid, doctors usually provide the patient with sodium bicarbonate in the effect it will increase the bloods pH resulting in the uncharged aspirin molecules to become charged. This is usually done until the urine of the patient is pH tested and increased to about a pH of 8.

Once the molecules are charged they navigate their way to the renal tube where the drug is filtered and finally excreted!
References