



## Tip of the Week Transcript:

from: [Episode 1 of the Nursing Show](#)

## Acid Base Balance

**Note: ALWAYS follow your own protocols and medical direction. The information presented here is for general information review only and not meant to take the place of your local guidelines.**

I thought I'd let that soothing interlude music kind of play out a little bit as we head out into a topic that gives a lot of people a great deal of stress. And since you're listening to this maybe while you're exercising, you're working on that stress anyway. But this is an important topic and it's something we need to have a good handle on. If you're a nursing student you've probably pulled your hair out over it. If you've been a nurse for a long time, maybe it's something you haven't revisited in a while.

I'm talking about acid base balance. (Scream.) I know, I know. It strikes fear in everyone's heart.

Well, there's a few basic concepts lying behind acid base balance, and I think at least for myself when I do some of my educational work with EMTs and paramedics in my other side of my medical career, I find

that acid base balance, once you get those few key concepts under your belt, tends to be not that hard. So we're going to start off here with an intro to acid base balance, and then in future episodes I'll come back and revisit some of those other parts, and we'll put it all together into a whole and look at acid base balance and some of the things in the nursing field at least that we need to be aware of.

So to start off with, I'm going to look at pH. What does pH mean? How is it defined? And what does it have to do with how the body operates? So we'll do a quick look at pH today, and then we'll touch on some of the other concepts lying behind acid base balance in the future.

The reason pH gives people a hard time is that it is an inverse logarithmic function. That means that it goes in the opposite direction you expect it to. And if you can keep that one key concept in your brain, you will have a head start to getting a handle on pH and the numbers behind acid base balance.

pH is a scale that goes from 0 to 14; 0 being extremely acidic and 14 being extremely alkalotic. In the middle is 7. 7 is normal as far as pH is concerned. However, it's not normal for the body. The body's normal plasma pH should fall somewhere between 7.35 and 7.45 on that scale. Anything below 6.8 is going to be outside of the realm of human life, and anything above 7.8 consequently also would be unviable as a blood pH level. So you get outside of those normal ranges and you start being either acidic or alkalotic.

Maybe if I draw a picture for you, it'll be a little bit easier. Okay. I can't draw a picture for you, but I can tell you how to draw the picture for yourself. Now of course, if you're driving you'll want to keep your hands on the wheel and your eyes on the road. Play this back when you get back to your room or back home or wherever it is you're going, get a piece of paper, and then draw the picture I'm going to tell you how to draw.

First off, I want to start in the middle of the paper. Draw a triangle with the point pointing up. Then you're going to create a see-saw on top of that triangle. Just draw a straight line across it with the triangle in the middle; the top of the bar resting on the top of the triangle. Now we're going to label the two sides of this see-saw. We're going to draw vertical lines just off to the side on either side of the see-

saw, and in the middle we're going to label on the left-hand side 7, and then at the bottom of that left-hand side's vertical line, you're going to put 0, and at the top you're going to put 14. On the right-hand side, you'll have a similar vertical line, and at the top of that vertical line, you're going to write Acidosis. In the middle you'll write Normal. At the bottom you'll write Alkalosis.

Now, right away you should be able to see how this inverse relationship is easily represented by this particular drawing or diagram. Because if you push the see-saw up or down from either side, it will point at the value that you would be looking for for the corresponding value on that side. So for instance, if I were start tipping the see-saw down below 7, towards, let's say number 3 -- if we were to continue to create that scale -- at the other side of that see-saw it's now pointing up towards Acidosis. This is how you can remember that acidosis is going to indicate a lower pH. Consequently, if you were to push the bar down towards alkalosis, then you would look on the other side, on the left-hand side, and you would see numbers higher than 7, or the higher pH numbers. And higher pH is an indication of alkalosis.

So this is a quick and easy way for you to remember pH and how it works, and you're just going to have to memorize the numbers 7.35 and 7.45 as the normal ranges for a person in homeostasis with acid base balance; the normal plasma pH. And anything outside of those values would be an indication of either lower numbers, indicating acidosis; higher numbers, indicating alkalosis.

Again, to remind you, the extreme outside numbers for human life; the viability numbers that are out there -- and you may see slightly different numbers in different textbooks, but some of the numbers I found seem to indicate 6.8 on the low end and 7.8 on the high end as the outside ranges for viability in human life.

So that's a quick overview of pH and how the numbers relate to acidosis and alkalosis. We'll check back in in a future episode and look at some of the other aspects of acidosis, alkalosis, and acid base balance.

### **Tip of the Week — Acid Base Balance Review**

- [Acidity vs. Alkalinity and pH \(link to World Anesthesia Online\)](#)