

# UNDERSTANDING THE DIFFERENCE BETWEEN KVP AND MAS

Kilovolts (kV) and mAs are the two primary controls that we have with an X-Ray tube. They control the amount of radiation and the quality of the radiation beam or the X-ray beam.

It is important to remember that if we increase the kV or we increase the mAs, we're going to see an increase in radiation dose.

## kVp



will control the penetrating power of your X-Ray beam or how energetic your X-Rays are

## How is produced?



The voltage difference between the cathode and the anode, that's kVp

## Process

The electrons will traverse the gap and at a much higher rate. The velocity that the electrons accelerate across the gap of the chamber will be higher and higher as we increase the voltage of the tube.

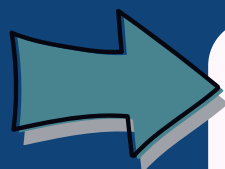
If we have higher and higher energy electrons hitting the anode, the resultant X-Rays will also be higher energy. With higher energy, we end up with more penetrating power or the ability for the X-Rays to penetrate thicker and more dense body parts.

As we increase the kV or the voltage difference, we increase the speed at which the electrons traverse the chamber. They impact the anode at a higher and higher energy and create higher energy X-Rays.

If we decrease the voltage, then we will see a decrease in the energy of X-Rays and the X-Rays become less penetrating.

## mAs

*is a control that's directly proportional to radiation dose.*



mAs is milliamps seconds. It's going to be directly proportional to the number of electrons that come off of the filament and are accelerated across the gap.

In a X-Ray tube we have a cathode. The electrons are moving across towards our anode. It will produce a certain number of X-Rays with a certain number of electrons. If we increase the mAs, we increase the number of electrons and the number of X-Ray formed.

## Explanation

If we double the mAs, then we're going to double the radiation dose to the patient.