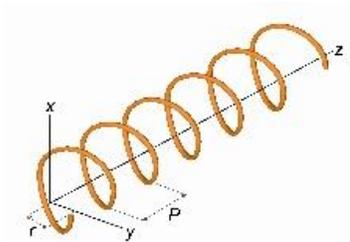


“Let’s Talk PITCH”

Hi! I’m Mike Enriquez, Author and presenter of The TUFFEST STUFF CT REGISTRY REVIEW LIVE LECTURE SEMINAR & “BABY BOARDS” CT EXAM EXPERIENCE. Thanks for stopping by. Please remember that you can download the PDF version of this discussion making it possible to more closely follow the technical discussion.



Because changes in PITCH impact patient dose and image quality, PITCH, as a factor, is as important as mA or kVp regarding CT imaging. As a factor, PITCH is a calculation that is part of every CT protocol.

PITCH is a consequence of Helical scanning. It must be considered because it results from the “corkscrew” nature of the beam over the patient’s body as the patient travels through the gantry during “x-ray-on.”

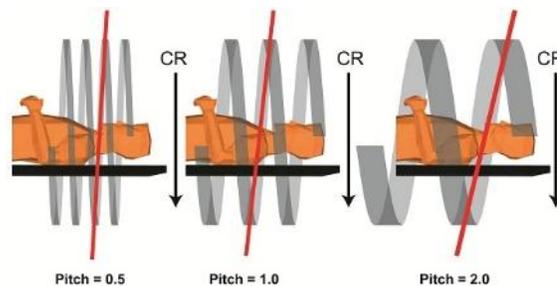
But, what is PITCH exactly? PITCH is a unit-less factor derived from three elements that are characteristic of modern Multi-detector Computed Tomography.

Element #1: Let me put it this way: If you, as a technologist have changed the index rate for a CT exam, that is, if you have changed how quickly or slowly the patient travels through the gantry.... you’ve changed PITCH.

Element #2: If, you as a technologist, has changed how fast the x-ray tube rotates within the gantry during a CT procedure....guess what? You’ve changed PITCH.

Element #3: And, third, if you have changed slice thickness prior to the acquisition phase or made a decision to use fewer or more detector rows for a particular CT procedure, guess what?.....you've changed PITCH!

Mathematically, in modern Multi-detector CT, PITCH can be calculated by dividing the value that is The Table Feed in mm per 360 degree tube rotation inside the gantry divided by Beam Width. In this calculation, Beam Width equals slice thickness x the number of detectors of the scanner.



To understand PITCH, a good visual to use is that of a slinky. As the slinky expands, that is, as you stretch out the slinky, PITCH increases; as the slinky contracts, PITCH decreases; also, the red line extending through the different helix versions represents SLICE PITCH. As PITCH INCREASES, SLICE PITCH INCREASES; and, as PITCH DECREASES, SLICE PITCH DECREASES.

With regard to PITCH, here are some important factors that change when PITCH changes:

As PITCH INCREASES, (as the slinky expands); PATIENT DOSE DECREASES

As PITCH DECREASES, (as the slinky contracts); PATIENT DOSE INCREASES.

As PITCH INCREASES; Image Quality DECREASES

As PITCH DECREASES; Image Quality INCREASES

As PITCH INCREASES; the amount of ANATOMY COVERED INCREASES

As PITCH DECREASES; the amount of ANATOMY COVERED DECREASES

As PITCH INCREASES; SLICE PITCH INCREASES, WHICH MEANS MORE INTERPOATION IS REQUIRED;

As PITCH DECREASES; SLICE PITCH DECREASES, WHICH MEANS LESS INTERPOLATION IS REQUIRED.

Well, there you have it, the essential elements of PITCH! If you have questions please contact me at your earliest convenience! Better yet, how about registering for one of my SEMINARS!

Take care for now and I wish you the very best of luck getting ready for the ARRT CT examination.