



**SNS COLLEGE OF ALLIED HEALTH SCIENCES**  
SNS Kalvi Nagar, Coimbatore - 35  
Affiliated to Dr MGR Medical University, Chennai



**DEPARTMENT OF RADIOGRAPHY AND IMAGING TECHNOLOGY**  
**II YEAR**

**COURSE NAME : CLINICAL RADIOGRAPHY POSITIONING**

**TOPIC – HIGH Kv TECHNIQUE**



# INTRODUCTION

- Along with the mAs (tube current, exposure time and filtration, kVp (tube voltage) is one of the primary settings that can be adjusted on x-ray machines to control the image quality and patient dose.
- **Kilovoltage peak (kVp)** is the peak potential applied to the x-ray tube, which accelerates electrons from the cathode to the anode in radiography or computed tomography.
- Tube voltage, in turn, determines the quantity and quality of the photons generated.

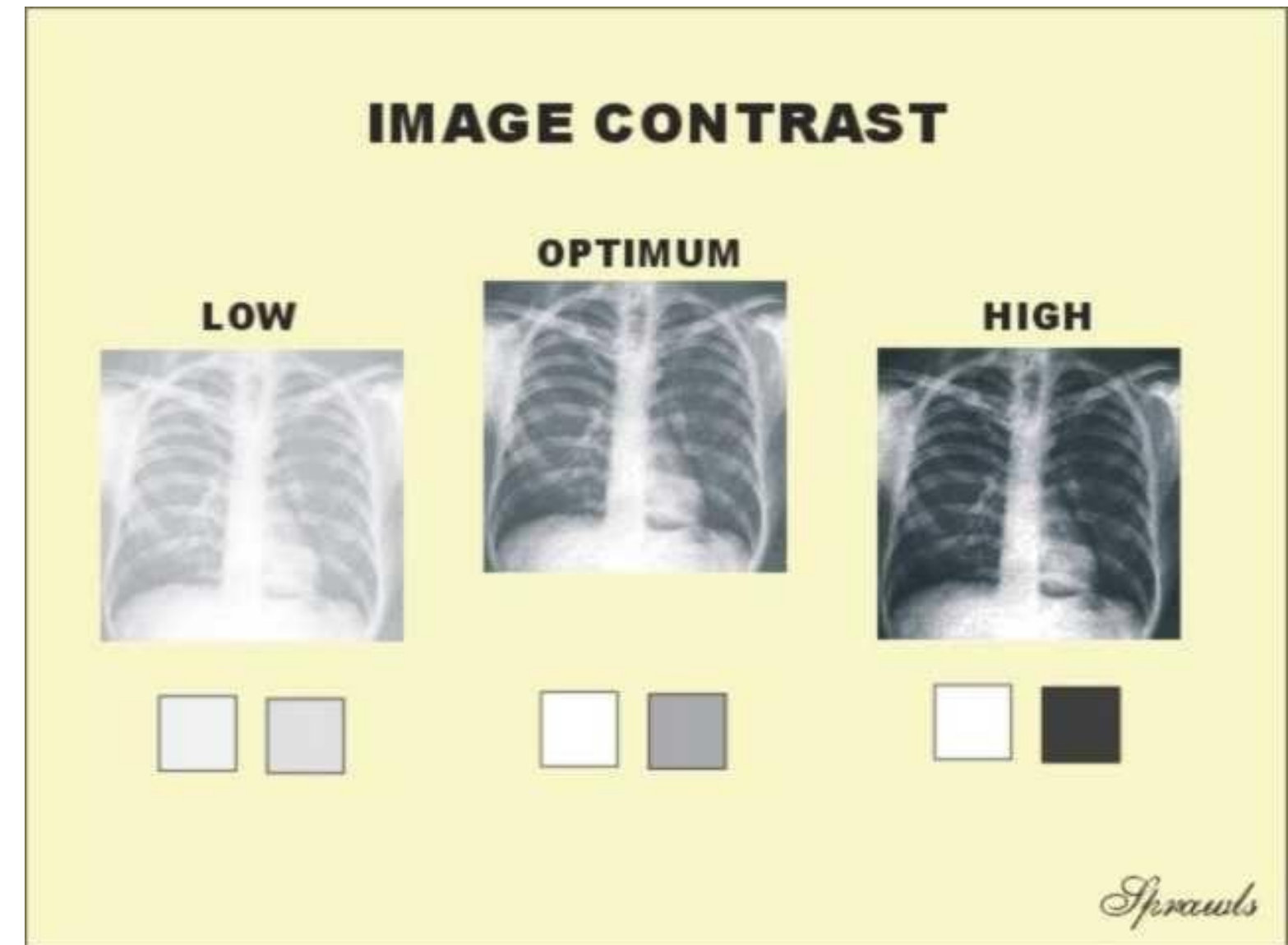


# HIGH Kv TECHNIQUE

- The first consideration when selecting the kVp is ensuring adequate penetration and exposure, which depends on photon number, photon energy, and tissue attenuation (which depends on attenuation coefficient and thickness).
- There must be an adequate number of sufficiently energetic photons that penetrate the patient and reach the image receptor.
- Particularly in larger body parts, such as obese adult, lower energy photons are absorbed completely without contributing to image formation. In such situations, higher kVp is employed to improve the x-ray intensity reaching the receptor.

## Cont.,

- The kilovoltage (kV) during the radiographic examination will determine the primary beams energy; higher energy effects increased penetrating power.
- A primary beam with greater kV results in an overall rise in penetration through all tissues, therefore resulting in a lower contrast radiograph.
- Hence, high kV technique of the chest x-ray is employed to present a more uniformly dense image to better appreciate the lung markings.





## Cont.,



- Scatter radiation travels in all directions and will decrease the contrast of the radiograph.

Factors that contribute to scatter radiation are increasing volume of tissue, tube kilovoltage, the density of matter, and field size.

Ways to reduce scatter include close collimation, grids, or air gap technique.

Meanwhile, the air gap technique will increase the geometric unsharpness of the image due to increase in patient-film distance, reduced field of view, and increase in patient dose.



## Cont.,



- The range of kilovoltages used in radiography is normally between 50 – 120 Kv, although Kv as low as 25 Kvp used for soft tissue examination such as mammography. When low Kvp is used, X-ray beam penetration is decreased resulting in more absorption and less transmission.
- High Kvp technique are used in chest radiography, employs a kilovoltage in excess of 120 Kvp.
- Increased Kvp – increases density – decreases contrast
- Decreased Kvp – decreases density – increases contrast.





## Cont.,



HIGH KVP TECHNIQUE	LOW KVP TECHNIQUE
More number of X-rays produced.	Less number of X-rays produced.
Greater penetration.	Lesser penetration.
Produces more scattered radiation.	Produces lesser scattered radiation.
Causes more grays (wide latitude).	Causes more black white (Narrow latitude).
Low contrast.	High contrast.
Increase in density.	Decrease in density.
Long scale & little difference in adjacent structures.	Short scale & great difference in adjacent structures.



# REFERENCE



- <https://radiopaedia.org/articles/radiographic-contrast>
- <https://armymedical.tpub.com/md0950/High-kVp-Technique-Fundamentals-of-X-Ray-Physics-143.htm>





**THANK  
YOU**