

EXPOSURES SETTINGS

X-RAY SET VARIABLES

Kilovoltage (kV, kVp)

- kV refers to the potential difference applied across an x-ray tube
- Determines the speed at which electrons travel across the x-ray tube and impact on the tungsten target.
- Traditional x-ray sets work at around 50kV, but most modern x-ray sets now produce a 65-70kV potential difference across the tube.
- Determines the energy of the x-ray photons produced at the target,
- which in turn determines the penetrating power or *quality* of the x-ray beam.

Milliamperage (mA)

- mA refers to the current flowing through the x-ray tube.
- Most dental sets operate between 7 – 12 mA.
- The current determines the number of electrons flowing from the filament to the target which in turn determines the number or *quantity* of x-ray photons in the beam.

Time (secs)

The length of time of the exposure also determines the number or *quantity* of x-ray photons in the beam.

KV essentially controls CONTRAST

Lower kV x-ray tubes create images with greater contrast (the visible difference between the dark soft tissues and the paler bones & teeth).

Higher kV tubes produce x-ray beams which penetrate bone & teeth better, causing these tissues to appear slightly darker on film, and showing less contrast with the darker soft tissues.

kV is inversely proportional to radiographic contrast

mA and time together (mAs) essentially control DEGREE OF BLACKENING

An over-exposed film is too black, while an under-exposed film is too pale.

INTERACTIONS OF X-RAYS WITH MATTER

1. Pure Absorption
2. Absorption & Scatter
- (3. Pure Scatter)
4. Transmitted unchanged

Energy absorbed from the x-ray beam by the tissues may lead to harm.

VIEWING CONDITIONS

Emulsion Films

Use a Specialised Light Box for Emulsion Films

Mask extraneous light

Dim room lights

Bright spot

Magnify image

Mount label and store correctly

Digital Images

View on a monitor with high screen resolution ex 1024x768

Restrict sunlight and bright room light

EVALUATE IMAGE QUALITY

A Acceptable

N Not acceptable

IF IMAGE IS UNACCEPTABLE ESTABLISH WHY...AND TAKE STEPS TO RECTIFY

DO NOT

- Take screening radiographs
- Omit to view previous films
- Take panoramic films on all patients
- Have single protocol for all patient
- Use inappropriate light sources

MINIMISE OR PREVENT RADIOGRAPHIC EXAMINATIONS

- Will result affect patient management or patient prognosis?
- Unnecessary repeat films-duplicate or copy or scan emulsion film
- Always view previous films of patient-can affect perception-shape-density-position
- Assure films taken are appropriate-what do you want to see?
- Assure QA does not impact on patient dose and care-Records-Processing

RADIOGRAPHIC INFORMATION

- should contribute to optimal standards of diagnosis and care
To ensure disease is not missed

RADIOGRAPHS UNDERTAKEN

- Individual need of the patient
- In relation to the history taken
After clinical examination