QUALITY ASSURANCE OF EXPOSURE PARAMETERS

Dr. Mahmoud S Dahoud

Fundamental of Radio Physics

Fall semester

Week 10

Date: Dec. 23rd 2025

Outline

Quality assurance of exposure parameters

X-ray output factors

Objectives

The student should be able to do the followings;

- Explain the Quality assurance of exposure parameters
- Mention x-ray output factors

Quality assurance

Quality assurance measurements ensure that

The machine generates just as much x-ray as needed to keep radiation exposure as low as possible to achieve good quality imaging and avoid repeated procedures.

Quality assurance testing is done for the safety of both patients and staf

Exposure Parameters

The four prime factors in radiographic exposure are

1- milliampere-seconds (mAs)

2- kilovoltage peak (kVp)

3- the distance between the X-ray source and the image receptor (SID),

4- exposure time

X-ray tube output

X-ray tube output is the measure of radiation intensity (dose) produced

X-ray tube output refers to the quantity (intensity) and quality (energy) of radiation produced,

determined by KVp (maximum energy/penetration),

mA (electron flux/intensity),

and exposure time (duration).

Output is measured in radiation dose (e.g., mGy/mAs) at 1 meter, with ~99% heat and ~1% x-rays produced

References

- Bushong S. C., . (2017). *Radiologic science for technologists*. St. Louis, Missouri: Elsevier.
- Al-Qurashi M., and Qasim H., . (2015). *Radiation Physics and its Applications in Diagnostic Radiological techniques.* Medical technical University, Iraq
- Hendee W., and Ritenour E.,. (2002). *Medical Imaging Physics*. Willy-Liss,Inc