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(INU)

Answer No:01

Advantages of Digital radiography over Film-screen radiography: -

The 10 advantages of digital radiography are as follow: -

1. It has reduced radiations.
2. It requires less space for the equipment.
3. No dark room is required.
4. Having less cost due to the elimination of chemical processors.
5. It allows us to obtain the X-ray images instantly.
6. It's processing time is far less than the traditional chemical processing methods.
7. It allows us to zoom in or out, flip and rotates the images.
8. It has a rapidly acting ability of changing images from light-on-dark imaging and dark-on-light imaging, which helps in making the fractures visible to us more easily.
9. Annotations (angles, marks, measurements) can be added to the images.
10. Digital radiography allows the radiologist to retake the image immediately. The patient has no longer to move from room to room, if the original image doesn't meet the needs of the doctor.

Answer No: - 02

<u>Direct Digital Radiography</u>	<u>Indirect Digital Radiography</u>
<ol style="list-style-type: none"> 1) Direct conversion of X-rays to electrical signals. X-rays → Electrical Signals. 2) Uses a photoconductor that directly converts the absorbed X-rays into electrical signals without any intermediary light production. 3) Detector used is amorphous selenium. 4) No spread of signals as the applied high voltage is attracts and separates the electrons. 5) Maintains the high resolution of the image as the photoconductor thickness is increased. 6) Perfect fill of nearly 100%. 7) Very sensitive to ambient temperature variations. 	<ol style="list-style-type: none"> 1) Indirect conversion of X-rays to electrical signals. X-rays → Light → Electrical signals. 2) Has a phosphor that converts the X-ray to light and photodiode array that converts emitted light into electrical signals. 3) Commonly used phosphors are thallium doped cesium iodide and gadolinium oxy-sulphide. 4) Light scatters and reduces the image resolution. 5) Generates poorer image as the phosphor thickness is increased. 6) Moderate fill factor depending on pixel size. 7) Less sensitive to ambient temperature variations.

Answer No: - 03**Importance of fill factor: -**

- It isolates each pixel element.
- Reacts like a switch to send the electrical charges to the photo processor.
- In digital radiography, the smaller the pixel size, the less the fill factor. Lower fill factor requires high patient dose so it is a tradeoff.

Answer No: - 04**The consequences: -**

- The consequences for producing flat panel digital image receptors at smaller pixels are noisy images.

Answer No: - 05**Features of Phosphor Imaging Plate: -**

- The imaging plate is coated with photostimulable phosphor, also called storage phosphor.
- The phosphor material is generally a kind of bariumfluorohalide.
- The imaging plate not only contains the phosphor layer but it has the following layers as well: -
 - i) Protective Layer: -**
 - It is a thin, clear and tough plastic which protects the phosphor layer.
 - ii) Reflective Layer: -**
 - It is a layer which sends the light in forward direction when released in the cassette reader.
 - iii) Conductive Layer: -**
 - It is a layer of material which absorbs and reduces the static electricity.

iv) Color Layer: -

- Newer plates may contain a color layer located in between the active layer and the support that absorbs the stimulating light.

v) Support Layer: -

- It is a semi rigid material which gives strength to the imaging sheet.

vi) Backing Layer: -

- It is a soft polymer which protects the cassette.