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[Document Related To]

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1.0		Resource DD/MM/YY			Initial Version

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## 1. Computed Radiography

### 1.1 Overview

- ✓ On 1970 theory of “filmless radiography” first introduced.
- ✓ 1981 Fuji introduced special cassettes with PSP plates (replaces film).
- ✓ First clinical use in Japan – 1983.
- ✓ By 1998 – over 5000 CR systems in use nationwide.
- ✓ 1998 – Local area hospitals begin to incorporate CR systems in their departments.
- ✓ (Riverside Co. Hosp builds new hospital in Moreno Valley) completely CR system – 1<sup>st</sup> generation equipment

### 1.2 What is Computed Radiography?

- ✓ Computed Radiography(CR) is similar to conventional radiography expect in the place of film to create the image, an Imaging Plate(IP) is used.
- ✓ Imaging Plate consists of 5 layers.
  - protective layer
  - Photo stimulable phosphor layer
  - Electro conductive layer
  - support and light shielding layers
- ✓ The Imaging Plate is run through a special laser scanner or CR reader that reads and digitize the image.
- ✓ The image is viewed using digital Image processing software.

### 1.3 Working

- ✓ Traditional X-ray machine with Imaging plate is used to take X-ray.
- ✓ The x-ray photons pass through the subject and strike the IP to form the latent image.
- ✓ The IP is typically bar-coded at an Image and Information Processing (IIP) station to ensure proper processing.
- ✓ Imaging Plate is then inserted into a machine often referred to as a CR reader.
- ✓ IP is scanned by laser beam. The stored energy is released from the IP in the form of light, known as Photostimulable Luminescence (PSL).
- ✓ The PSL is collected and passed through a photomultiplier, then converted to a digital signal.

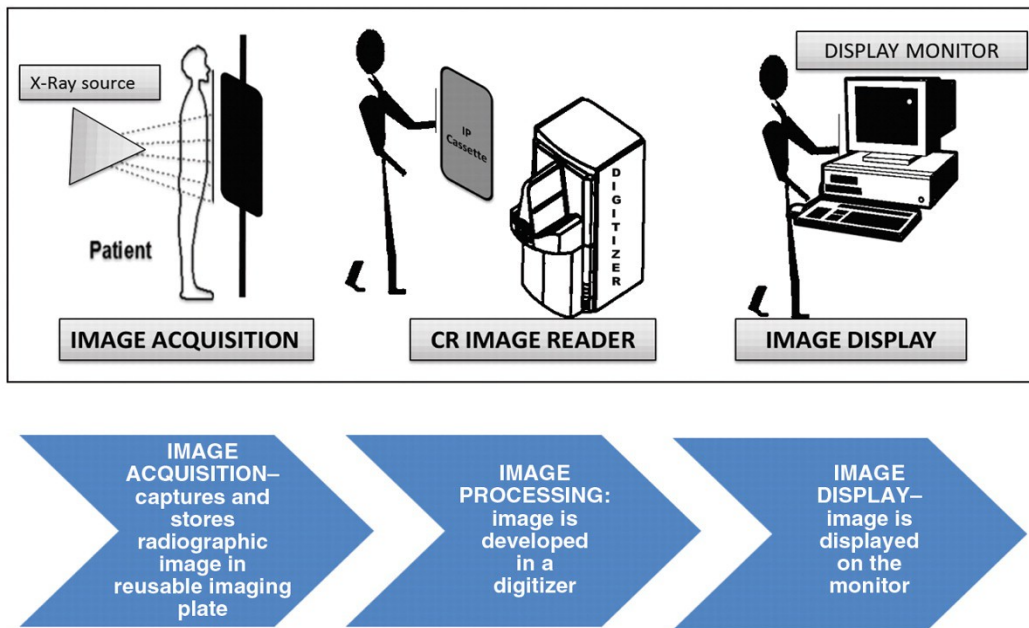


Fig 1:Computed Radiography flow

- ✓ Imaging Plates can be re-used multiple of times if they are handled carefully and under certain radiation exposure conditions .

#### 1 . 4 Preparation for Computed Radiography test

- ✓ Before the Computed Radiography(X-ray), you generally undress from the waist up and wear an exam gown. You'll need to remove jewelry from the waist up, too, since both clothing and jewelry can obscure the X-ray images.
- ✓ In some cases, you may be asked not to eat or drink anything for up to four hours before the scan, and sometimes you may be asked to drink a fairly large amount of water beforehand. This depends on the area being scanned.

#### 1 . 5 Benefits and Risks

##### Benefits:

- ✓ Better Images quality than Conventional Radiography images.
- ✓ Faster image acquisition
- ✓ Easy to manipulate the Computed Radiography images (Edge enhancement, contrast ).
- ✓ Increased savings: no film, chemicals, dark room and storage room required .

**Risks:**

- ✓ It is hard to keep the cassette safe .
- ✓ x-rays makes our blood cells to have higher level of hydrogen peroxide which could cause cell damage.

**1 . 6 Summary**

- ✓ Computed Radiography Technique is used to replace the film while taking X-ray. It is easily portable.
- ✓ It saves the time of technicians and doctors manipulation time.

**1 . 7 References**

S. No	URL
1	<a href="http://www.chavatdaat.co.il/loadedFiles/Presentation%20CR.pdf">http://www.chavatdaat.co.il/loadedFiles/Presentation%20CR.pdf</a>
2	<a href="https://en.wikipedia.org/wiki/Computed_radiography">https://en.wikipedia.org/wiki/Computed_radiography</a>
3	<a href="http://www.slideshare.net/shonimaindiaultrasound/cr-and-dr-ppt">http://www.slideshare.net/shonimaindiaultrasound/cr-and-dr-ppt</a>
4	<a href="http://www.slideshare.net/LirihKuu/computed-radiography">http://www.slideshare.net/LirihKuu/computed-radiography</a>
5	<a href="http://www.fujifilm.com/products/medical/digital_imaging/basic/">http://www.fujifilm.com/products/medical/digital_imaging/basic/</a>
6	<a href="http://www.xraymed.com/CR%20Basics%20and%20FAQ.pdf">http://www.xraymed.com/CR%20Basics%20and%20FAQ.pdf</a>
7	<a href="https://info.blockimaging.com/digital-x-ray-cr-vs.-dr">https://info.blockimaging.com/digital-x-ray-cr-vs.-dr</a>

**1 . 8 Glossary**

S. No	Term	Description
1	Imaging Plate	Recording plate that replaced films