



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
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DEPARTMENT OF RADIOGRAPHY AND IMAGING TECHNOLOGY

I YEAR

TOPIC - FLUOROSCOPY



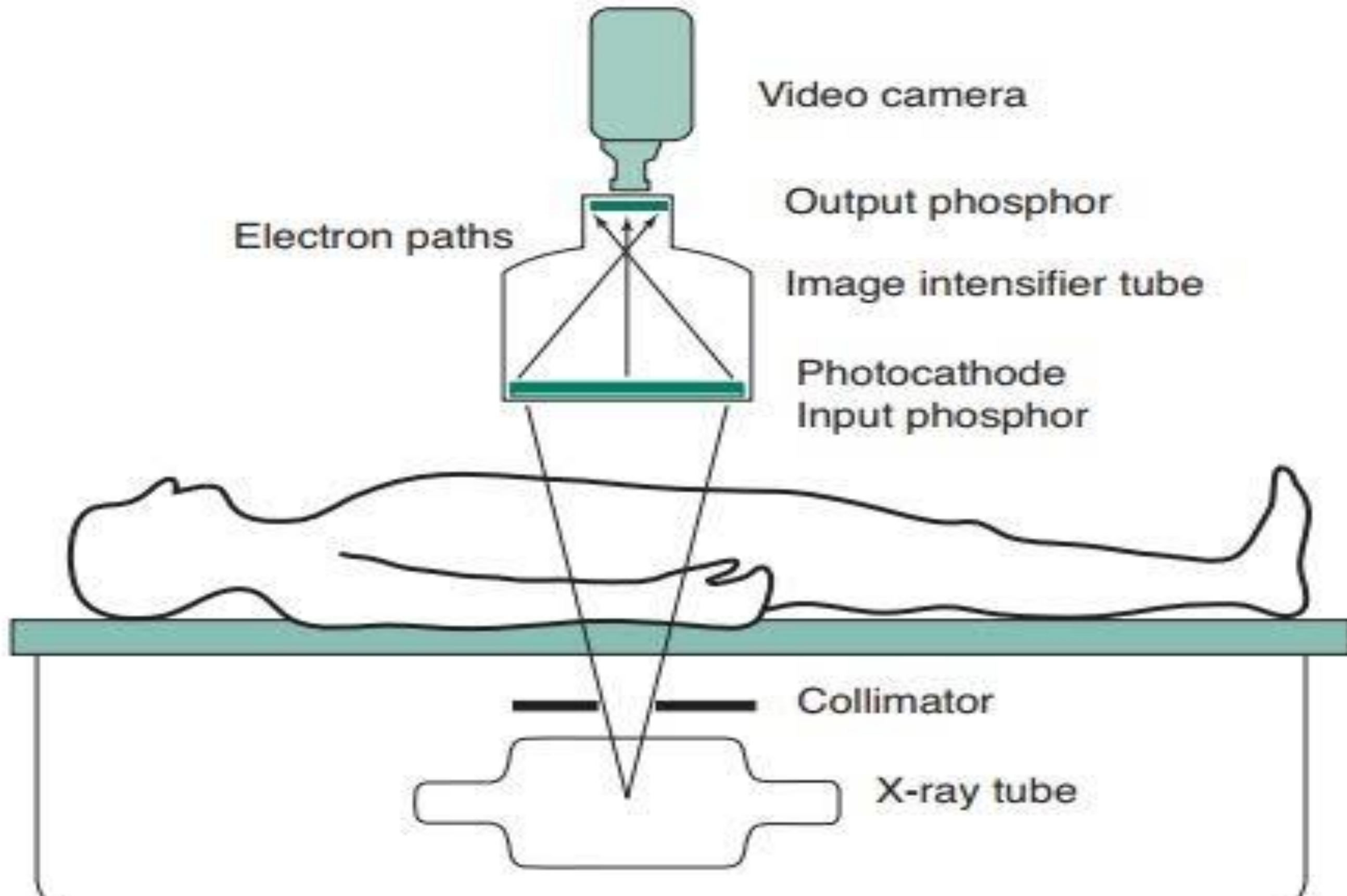
FLUOROSCOPY

- Fluoroscopy is a study of moving body structure.
- A continuous x ray beam is passed through the body part being examined.
- The beam is transmitted to a TV like monitor so that the body part and its motion can be seen in detail.
- Fluoroscopy as an imaging tool, enables physicians to look at many body systems including the skeletal, digestive, urinary, respiratory & reproductive.



FLUOROSCOPY EQUIPMENT







APPLICATIONS

Fluoroscopy has wide variety of application such as

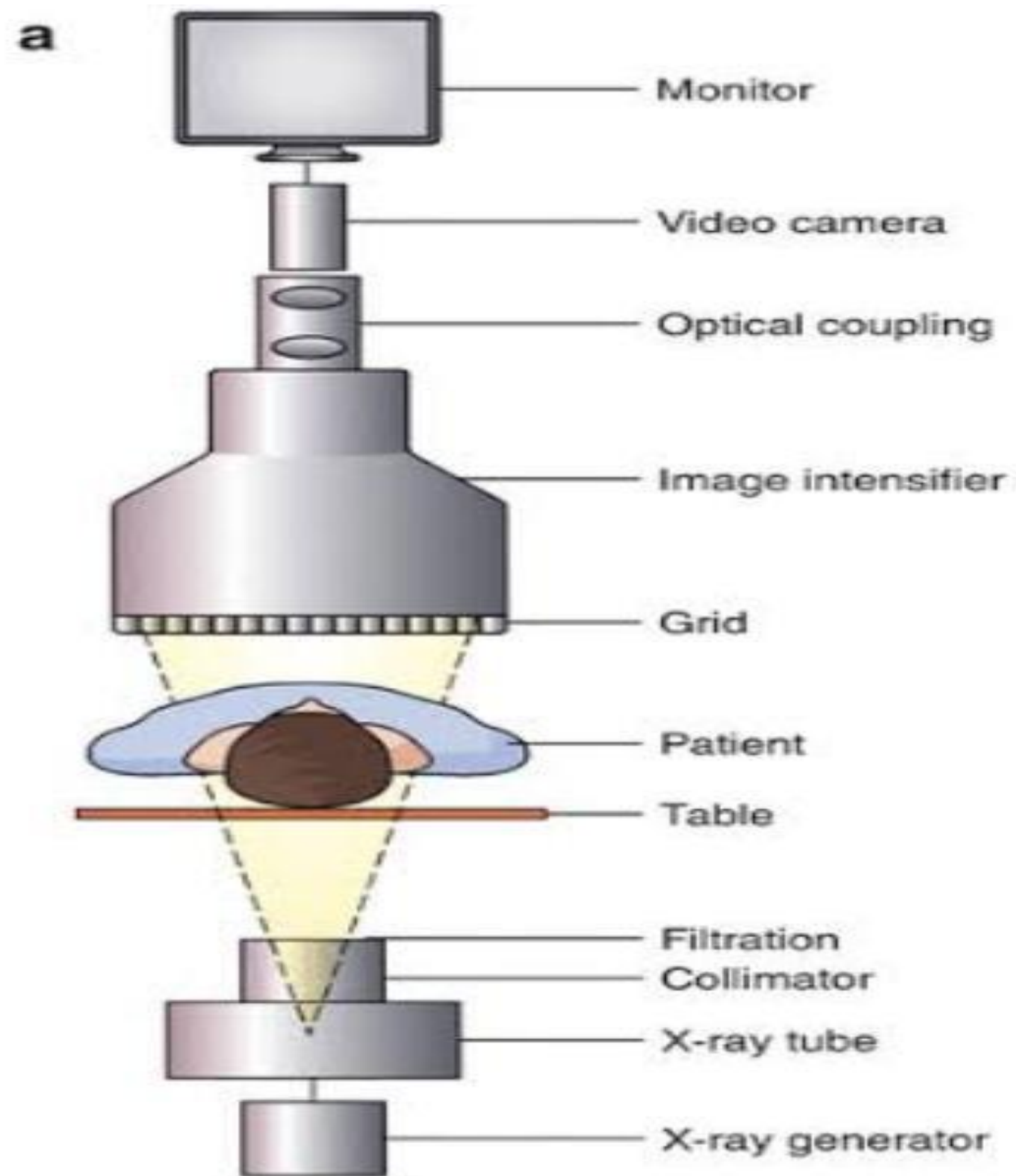
- Photospot imaging
- Spot film Acquisition
- Digital Subtraction Angiography
- Endoscopic examination
- Lithotripsy and Cineradiography

Other Uses of Fluoroscopy

- Locating foreign bodies.
- Image guided anesthetic injections into Joints or spine.
 - Percutaneous vertebroplasty, A minimally invasive procedure used to treat compression fractures of the vertebrae of the spine.

Components of Fluoroscope

- X-ray generator
- Collimator
- Patient table
- Image Intensifier
- Television System
- X ray tube
- Filters
- Grids
- Optical Coupling
- Image Recording





Older Fluoroscopy

- In the beginning, fluoroscopy was performed by viewing the live image, produced by the X rays on the thick intensifying screen.
- The room must be completely dark so that faint glow of the screen could be seen.
- The radiologists also wear red goggles for dark adaptation. The difficulties involved in dark adaptation and working in dark room lead to the development of Image Intensifier.

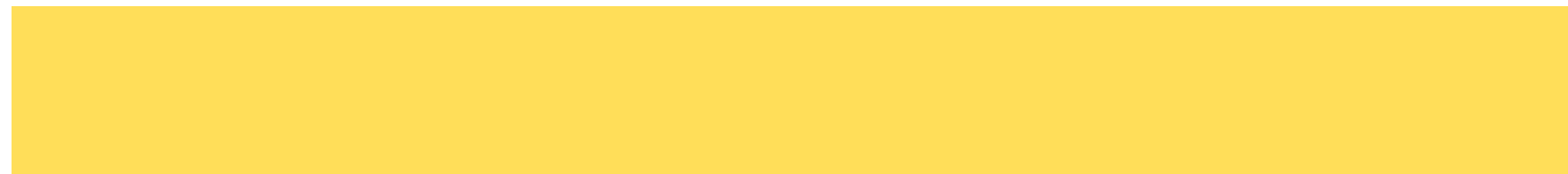


Disadvantage of older Fluoroscopy

Room need complete darkness.

Patient dose was very high.

Only one person can view image





Early Fluoroscopy

The image was viewed directly -- the X ray photons struck the Fluoroscopy screen emitting the light. Modern system use image Intensifiers and closed circuit TV system.

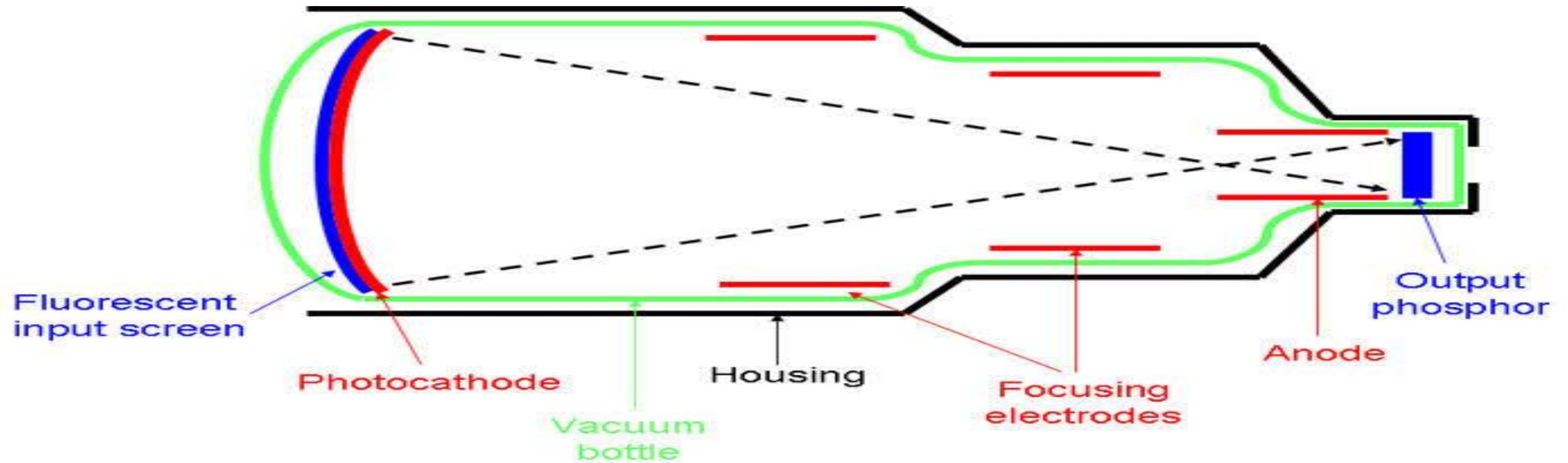




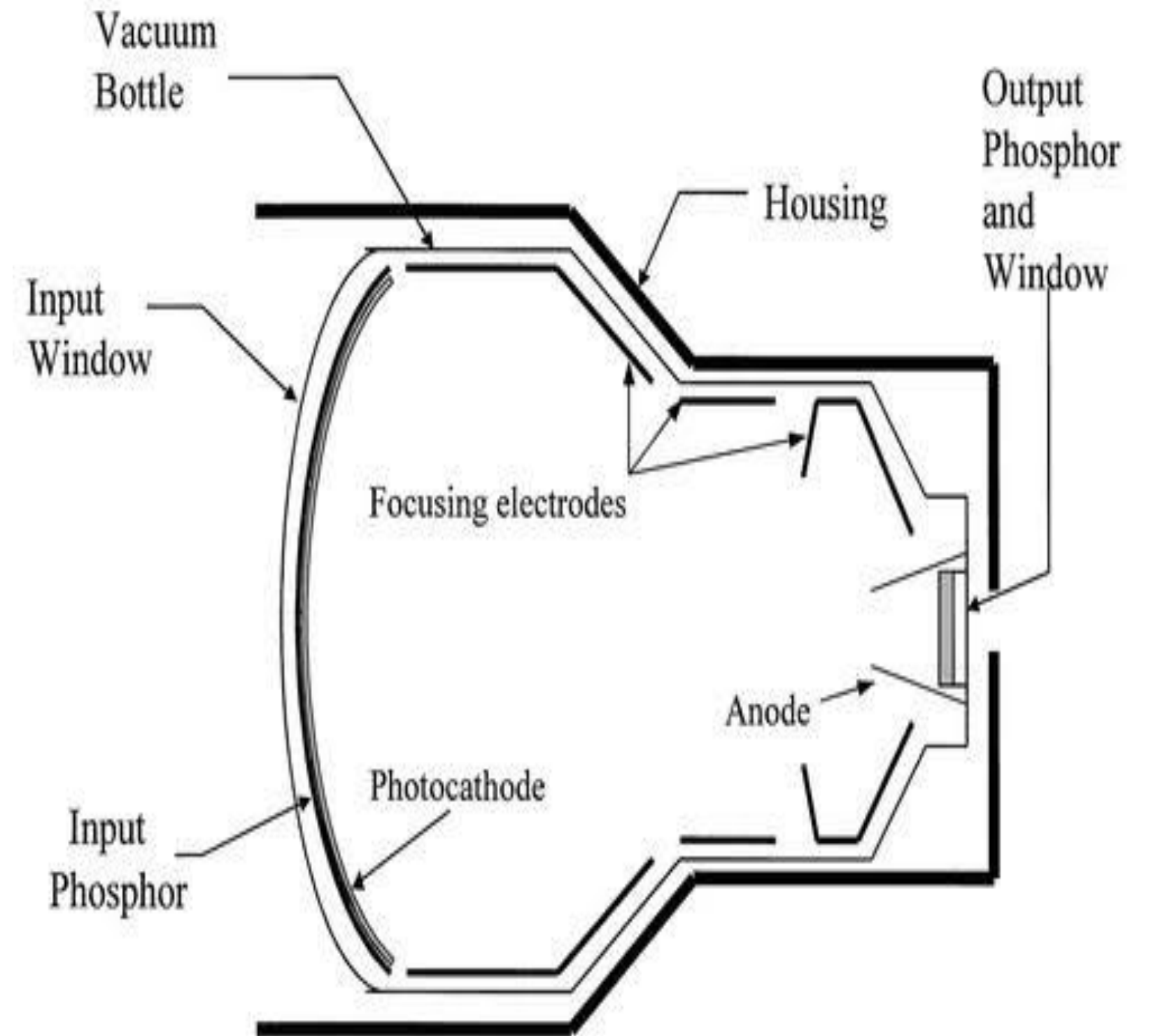
IMAGE INTENSIFIER

- The image Intensifier is a complex electronic device that receives the X ray beam and converts it into light.
- An image Intensifier is a evacuated glass envelope which contains four basic elements. They are
 - i) Input phosphor and photo cathode
 - ii) Electrostatic focussing lens
 - iii) Accelerating anode
 - iv) output phosphor.

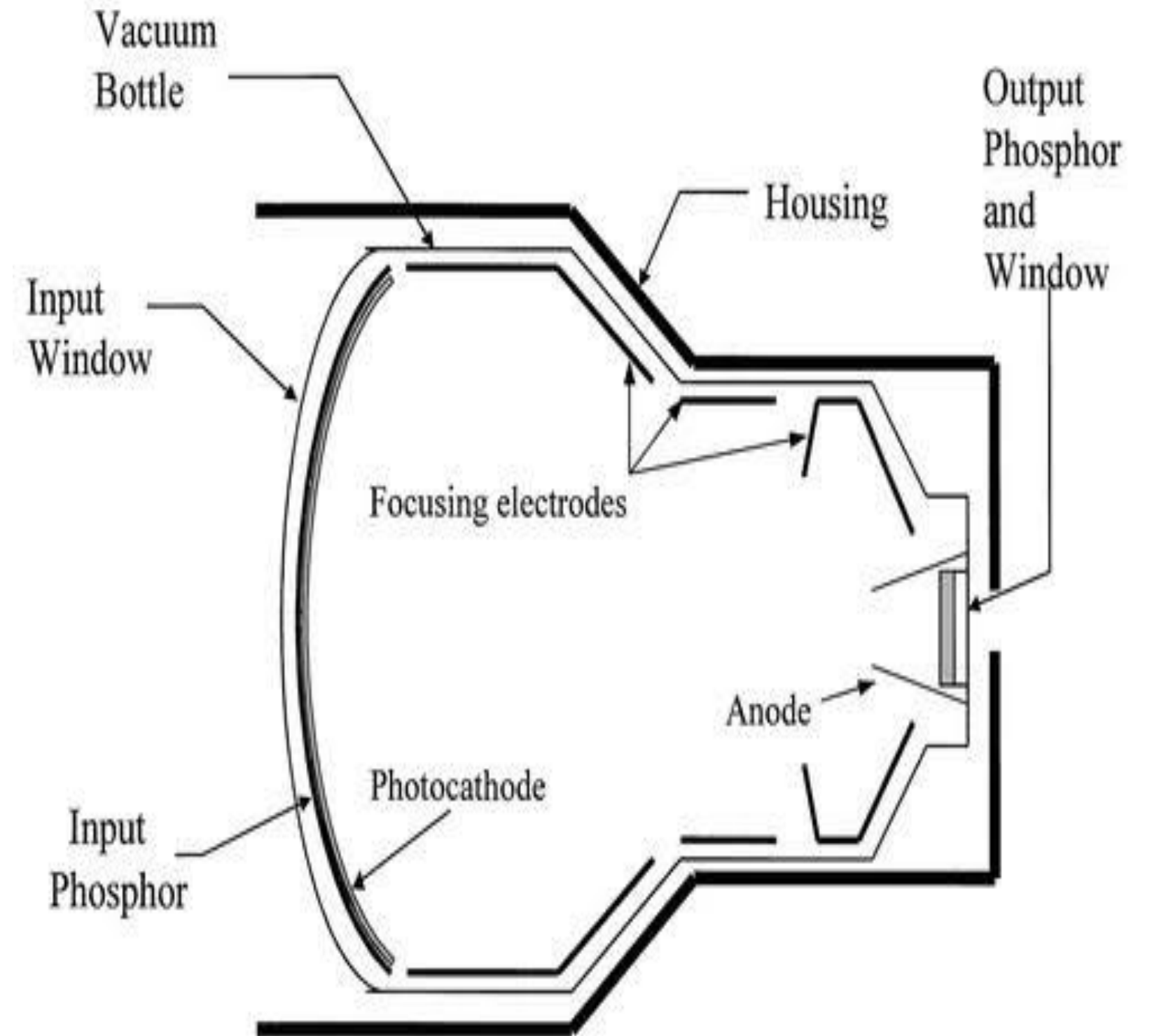
- The input phosphor has three layers namely a thin aluminium window, substrate layer to support the phosphor, CsI input phosphor and a photocathode.
- CsI is the most suitable phosphor, because it is a vertically oriented crystal, which can direct the light towards the photocathode.



- The output phosphor most widely used is zinc cadmium sulfide compound doped with silver.
 - The electrodes (D1, D2) and the anode near the output phosphor comprise the electrostatic lens.
 - X ray from the patient passes through the Al window and falls on the input phosphor. This phosphor absorbs X rays and emits visible light.
 - The light is absorbed by the photocathode which ejects low energy photoelectrons.



- The electrostatic lens system, accelerate and focus the electrons onto the output phosphor.
- The output phosphor absorbs the electrons and emits large amount of green light.
- Each electron causes a emission of about 1000 light photons, as a result a very bright image is formed on the output phosphor or viewing screen.





- This image can be viewed by a video camera, which converts light images into video signals.
- This can be viewed on TV monitor which enlarges the image to the original size.
- Thus the image Intensifier, converts the X ray photons to light photons.



ADVANTAGE OF FLUOROSCOPY

- Allows a physician to see a live image of the body's internal organs in order to observe their size, shape and movement.
- Provide dynamic and functional information.
- Readily available.
- Inexpensive.
- Allow real time imaging.
- Good for visualized bony structure.



DISADVANTAGE OF FLUOROSCOPY

- Although radiation is minimal, there is the chance of skin injury due to radiation exposure, as well as the usual risks associated with radiation.
- May display overlapping of anatomy.
- May be limited by patient mobility.
- Poor soft tissue resolution.
- Use ionizing radiation.



THANK YOU