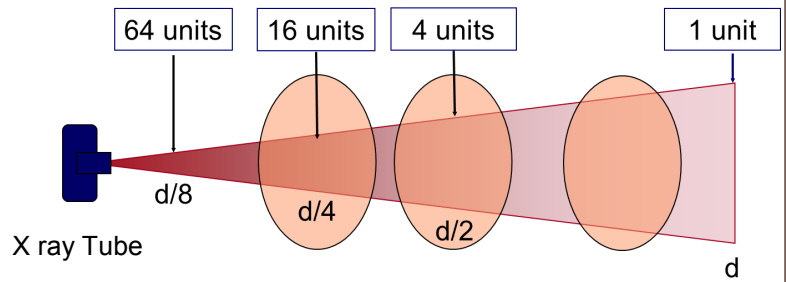
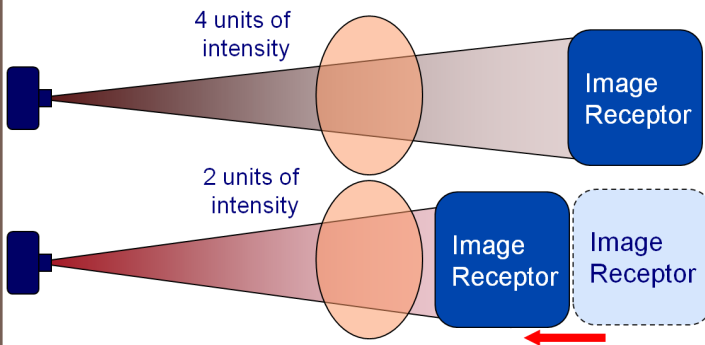


# 10 Pearls: Radiation protection of patients in fluoroscopy

**1. Maximize distance between the X ray tube and the patient to the extent possible**

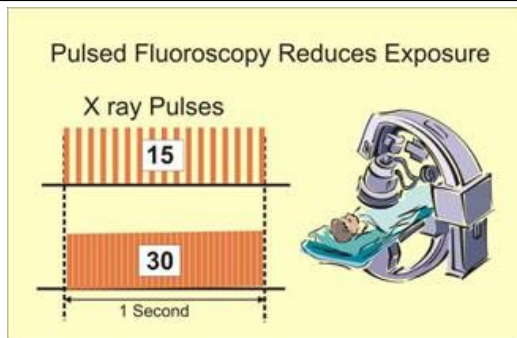
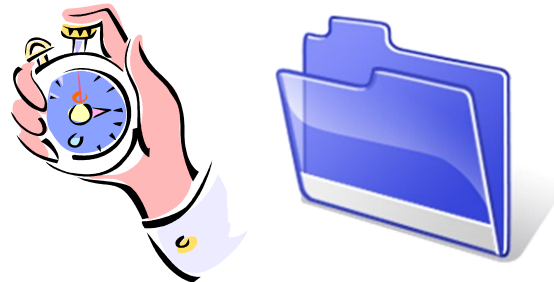


**2. Minimize distance between the patient and the image receptor**



**3. Minimize fluoroscopy time**

**Keep records of fluoroscopy time for every patient**



**4. Use pulsed fluoroscopy with the lowest frame rate possible to obtain images of acceptable quality**

**5. Avoid exposing the same area of the skin in different projections**

**Vary the beam entrance port by Rotating the tube around the patient**

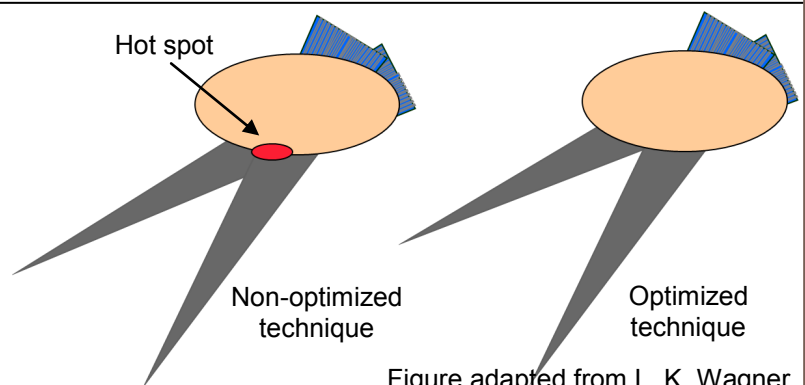


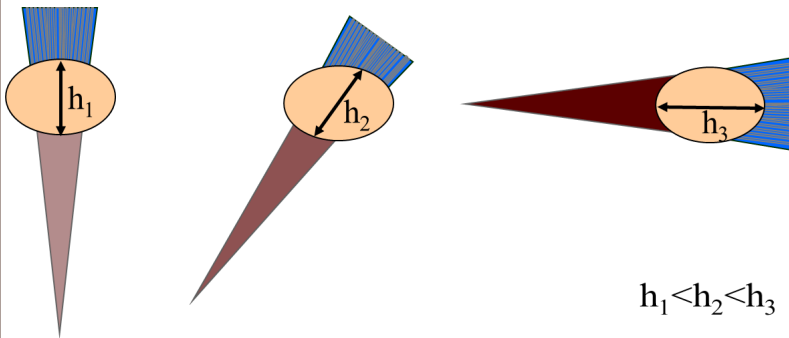
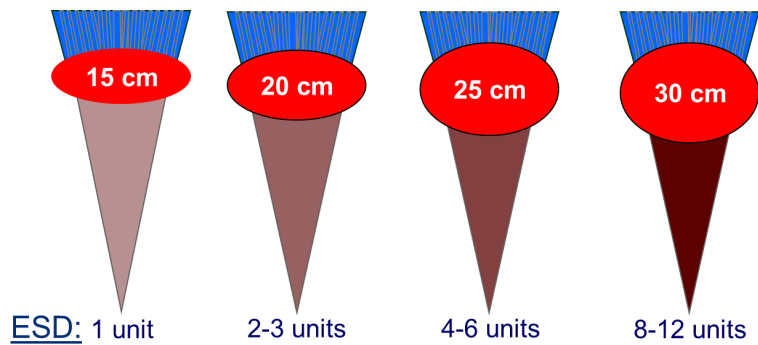
Figure adapted from L. K. Wagner



**RPOP**  
Radiation  
Protection  
of Patients

# 10 Pearls: Radiation protection of patients in fluoroscopy

**6. Larger patients or thicker body parts trigger an increase in entrance surface dose (ESD)**



**7. Oblique projections also increase ESD**

**Be aware that increased ESD increases the probability of skin injury**

INTENSIFIER Field-of-view (FOV)	RELATIVE PATIENT ENTRANCE DOSE RATE FOR SOME UNITS
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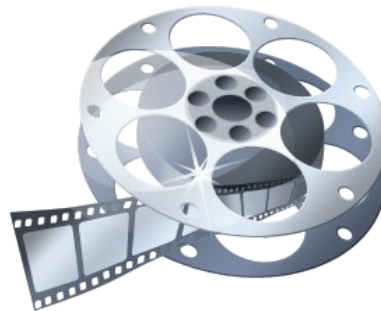
	12" (32 cm)	100
	9" (22 cm)	200
	6" (16 cm)	300
	4.5" (11 cm)	400

**8. Avoid the use of magnification**

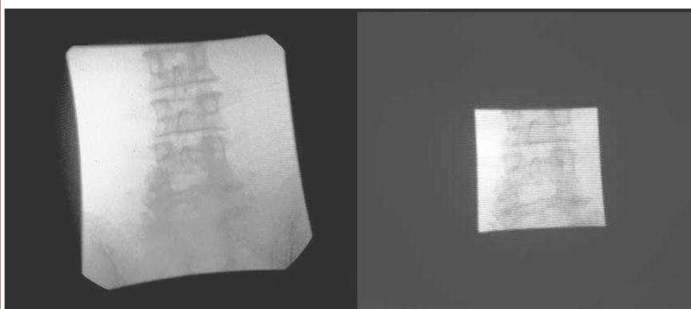
**Decreasing the field of view by a factor of two, increases dose rate by a factor of four**

**9. Minimize number of frames and cine runs to clinically acceptable level**

**Avoid using the acquisition mode for fluoroscopy**



**Documentation should be performed with last image hold when ever possible and not with cine images**



**10. Use collimation**

**Collimate the X ray beam to the area of interest**



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