

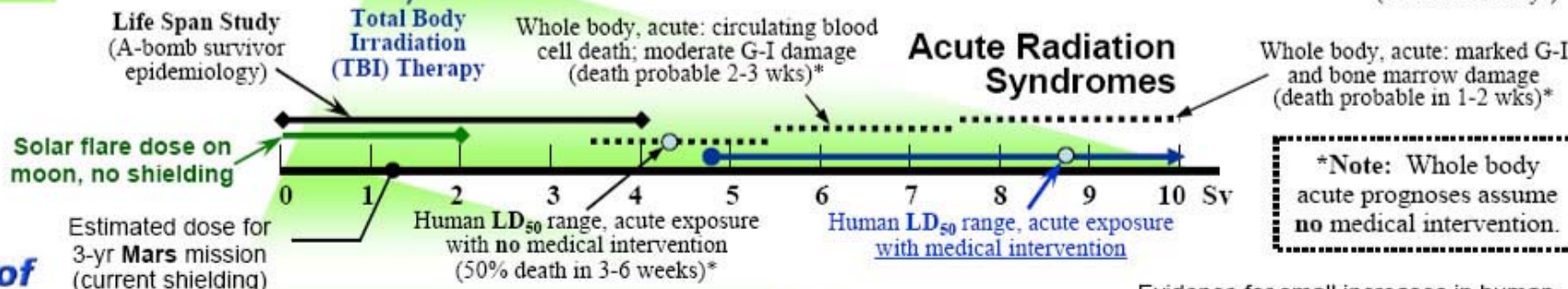
# Ionizing Radiation Dose Ranges (Sievert)



Whole body, acute: G-I destruction; lung damage; cognitive dysfunction (death certain in 5 to 12 days)\*

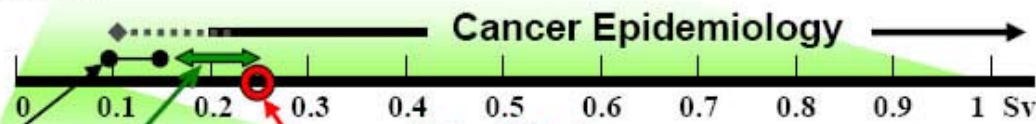
## Cancer Radiotherapy total dose to tumor

acute exposure = all at once; chronic = hours, days, years



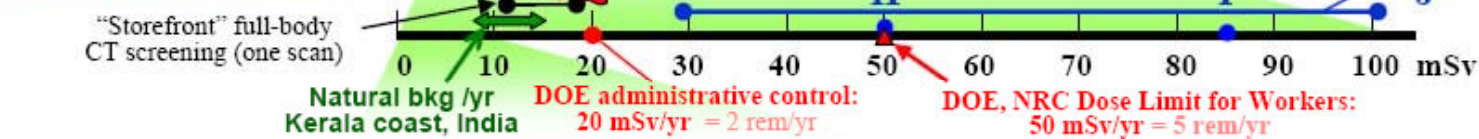
\*Note: Whole body acute prognoses assume no medical intervention.

Evidence for small increases in human cancer above 0.1 Sv acute exposure, 0.2 Sv chronic exposure

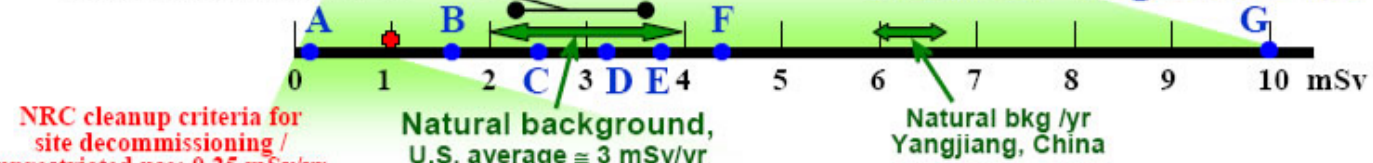


EPA radiological emergency guideline for public relocation

## DOE Low Dose Program



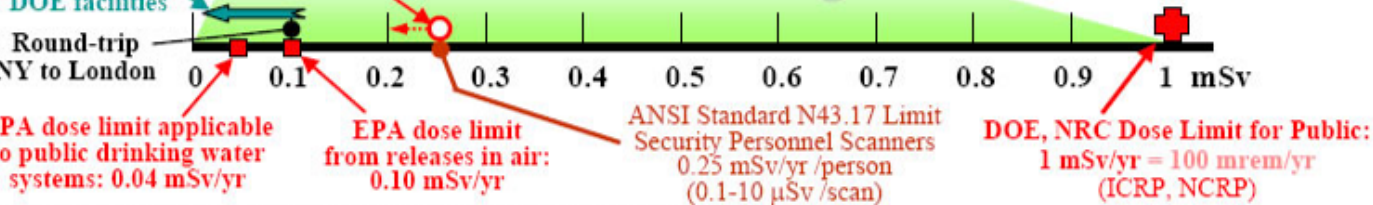
## Medical Diagnostics (A-J)



### Medical Diagnostics, mSv

A- Chest x-ray (1 film)	0.1
B- Dental oral exam	1.6
C- Mammogram	2.5
D- Lumbosacral spine	3.2
E- PET	3.7
F- Bone (Tc-99m)	4.4
G- Cardiac (Tc-99m)	10
H- Cranial CT (MSAD) (multiple scan average dose)	50
I- Barium contrast G-I fluoroscopy (2 min scan)	85
J- Spiral CT- full body	30-100

## Regulations & Guidelines



**LD<sub>50</sub> = Lethal Dose to 50%**  
(the acute whole body dose that results in lethality to 50% of the exposed individuals)

**Absorbed dose: 1 Gray = 100 rad**  
**Dose equivalent: 1 Sievert = 100 rem**  
**1 mSv = 100 mrem**  
(1 Sv = 1 Gy for x- and gamma-rays)

Note: This chart was constructed with the intention of providing a simple, user-friendly, "order-of-magnitude" reference for radiation quantities of interest to scientists, managers, and the general public. In that spirit, most quantities were expressed in the more commonly used radiation protection unit, the rem (or Sievert, 2nd page), and medical doses are not in "effective" dose. It is acknowledged that the decision to use one set of units does not address everyone's needs. (NRC—US Nuclear Regulatory Commission; EPA—US Environmental Protection Agency) Disclaimer: Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information disclosed.

Chart compiled by NF Metting, Office of Science, DOE/BER "Orders of Magnitude" revised March 2006