

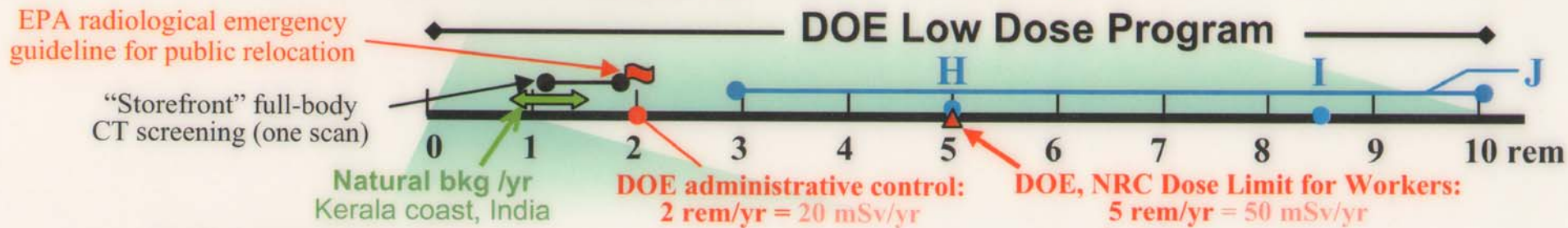
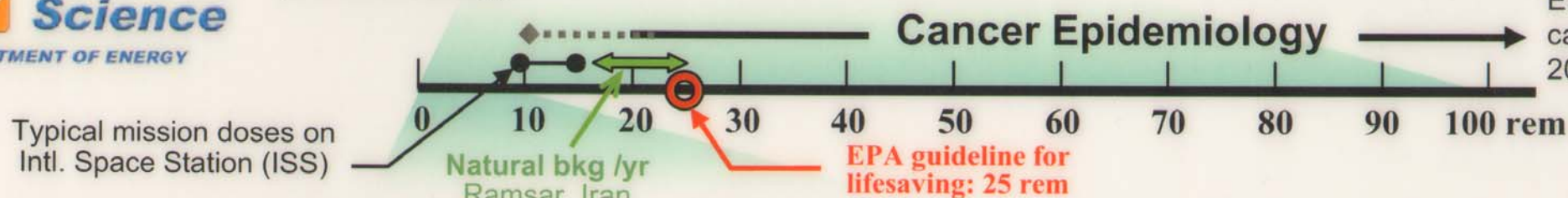
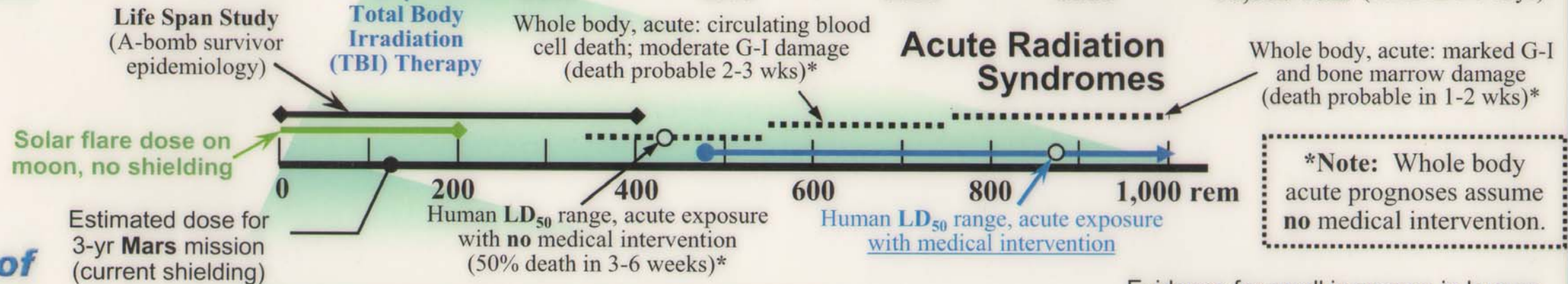
# Ionizing Radiation Dose Ranges (Rem)



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

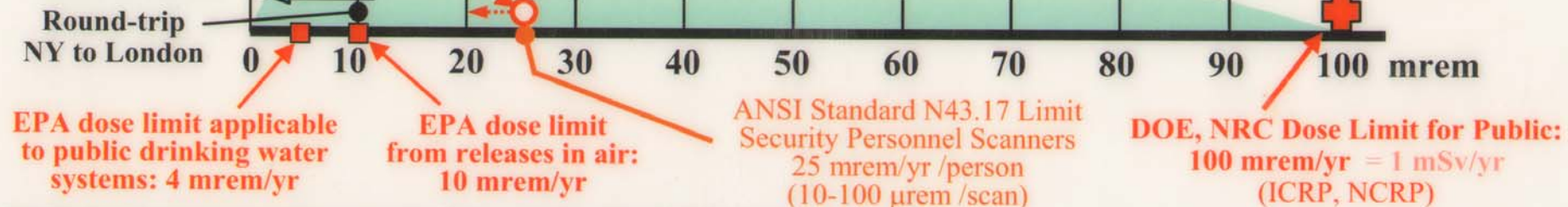
## Cancer Radiotherapy total dose to tumor

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



### Medical Diagnostics, rem

A- Chest x-ray (1 film)	0.01
B- Dental oral exam	0.16
C- Mammogram	0.25
D- Lumbosacral spine	0.32
E- PET	0.37
F- Bone (Tc-99m)	0.44
G- Cardiac (Tc-99m)	1
H- Cranial CT (MSAD) (multiple scan average dose)	5
I- Barium contrast G-I fluoroscopy (2 min scan)	8.5
J- Spiral CT- full body	3 - 10



**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: 100 rad = 1 Gray  
Dose equivalent: 100 rem = 1 Sievert  
100 mrem = 1 mSv

(1 rem = 1 rad 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)  
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Chart compiled by NF Metting, Office of Science, DOE/BER  
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