



# **SNS COLLEGE OF ALLIED HEALTH SCIENCES- COIMBATORE 35**



**DEPARTMENT : RADIOGRAPHY AND IMAGNG TECHNOLOGY**

**SUBJECT : QUALITY CONTROL, RADIOBIOLOGY AND RADIATION SAFETY IN  
RADIODIAGNOSIS/ IMAGING OTHERTHAN X-ray RELATED**

**PAPER : PAPER II ( UNIT 3 – RADIOACTIVITY )**

**TOPIC : 1. DOSE LIMITS FOR WORKERS AND PUBLIC**



# DOSE LIMITS



- Several scientific groups provide information and recommendations concerning radiation safety. These groups include,
- The National Council on Radiation Protection ( NCRP )
- The International Commission of Radiological Protection ( ICRP )
- The international Atomic Energy Agency ( IAEA ) and
- The American National Standards Institute ( ANSI )
- Scientists with these agencies have determined acceptable dose limits for the radiation worker.
- No clinical evidence of harm would be expected in an adult working within these dose limits for an entire lifetime.
- Committees of scientists in this field of radiation science and biology periodically review the literature and, if indicated, recommend changes in the dose limits.
- These groups provide only recommendations without the force of law and do not enforce or establish radiation safety policy.



# DOSE LIMITS ( ICRP-60,1990)



S.NO	APPLICATION	OCCUPATIONAL, mSv/year	PUBLIC. mSv/year
1.	Effective Dose ( Based on Stochastic Effects )	20 * ( 50 mSv annual effective dose limit and 100mSv in 5 years cumulative effective dose limits)	1 ( if needed, higher values provided that the annual average over 5 years does not exceed 1mSv )
2.	Eye lens ( Based on deterministic effects)	150	15
3.	Skin ( skin 100 sq.cm ) ( based on deterministic effects)	500	50
4.	Hands, and feet ( Based on deterministic effects )	500	50
5.	Fetus	1mSv, after diagnosis	-

- Averaged over any 5 consecutive years. The maximum effective dose limit is 50mSv / year.
- 1mSv = 100 mRem



# DOSE LIMITS ( NCRP-91, 1987)



S.NO	APPLICATION	OCCUPATIONAL, mSv/year	PUBLIC. mSv/year
1.	Effective Dose	50	1
2.	Eye lens	150	15
3.	All others ( Skin, extremities, breast, lung, etc..	500	50
4.	Embryo- Fetus	5, ( 0.5 mSv per month )	-



# DOSE LIMITS

## ( AERB, Government of India, 2001 )



### WORKERS

- The cumulative dose over a block of five years shall not exceed 100mSv
- The effective dose dose in any calendar year to the lens of the eye shall not exceed 150 mSv
- (i) The equivalent dose in any calendar year to the lens of the eye shall not exceed 150 mSv.
- (ii) The equivalent dose in any calendar year to the skin, the hands and feet shall not exceed 500 mSv.
- Incase of women worker of reproductive age, once pregnancy has been established, the conceptus shall be protected by applying a supplementary equivalent dose limit to the surface of the woman abdomen ( lower trunk) of 1 mSv for the remainder of the pregnancy.
- Internal exposures shall be controlled by limiting intakes of radionuclides to about 1/20 off ALI. The employment shall be of such type that it dose not carry a probability of high accidental dose and intakes.



# DOSE LIMITS

## ( AERB, Government of India, 2001 )



### TRAINEES

- The effective dose in any calendar year shall not exceed 6 mSv.

### PUBLIC

- The Effective dose in any calendar year shall not exceed 1 mSv.
- In special circumstances, a higher value of effective dose is allowed in a single year, provided that the effective dose averaged over a 5 year period does not exceed 1 mSv/year.



# INTERROGATIONS



1. What is Exposure ?
2. What is dose limits ?
3. Why the public dose limits is less ?



# REFERENCES

1. Radiologic science for technologist – 9th edition (2008) Stewart Carlyle Bushong, Mosby Elsevier, UK.
2. Text Book of Radiological Safety – K. Thaylan (2010) Jaypee Brothers and medical Publishers, New Delhi.
3. Quality Control in Diagnostic Imaging J.E.Gray





**THANK YOU**