PPH446: NUCLEAR MEDICINE

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3	1	0	3.5

Course objectives: To train student on theoretical aspects of various nuclear techniques to scan and cure the diseases in the human body.

Rectilinear Scanner and Photography: Collimation, scattering and attenuation, block diagram, principle of working, effect of scanning speed, dot factor, time constant, line spacing, film density, photo recording display, contrast enhancement and clinical applications.

Gamma Camera: Basic principles of gamma camera, collimators - parallel hole, divergent, convergent pinhole, fan beam, slant hole collimator, NaI (Tl) detector.

Single Photon Emission Computerized Tomography: Theory aspects, rotating gamma camera and the couch, single or multiple section devices multi detector SPECT, matrix selection, rotating arc selection. Image reconstruction techniques.

Imaging: Renal, Bone, Gastrointestinal and Lung imaging static blood pool imaging, Rest/stress myocardial imaging, infarct imaging, MUGA, gated blood pool study, first pass study (shunt detection), 201Tl imaging Central nervous study- cerebral blood flow dynamic studies, static brain imaging.

Bone Marrow: Radiopharmaceuticals and imaging techniques studies- red-cell mass estimation, RBC survival and sequestration studies.

Course Learning Outcomes (CLO):
Students will have understanding of:

1. different techniques use radiation to scan human body
2. how to use nuclear technology to treat the deceases.

Recommended Books:

1. *Saha, Gopal B., Physics and Radio Biology of Nuclear Medicine, Springer,*
2. *Trapp, J.U. and Kron, T, An Introduction to Radiation Protection in Medicine, Taylor & Francis, (2008).*
3. *Saha, Gopal B., Fundamentals of Nuclear Pharmacy, Springer, (2010).*
4. *Hondee, W.R. and Ritondur, E.R., Medical Imaging Physics, New York: Wiley-Liss, (2002).*