

Nuclear Medical Physics (NMP) Oral Exam Content

1. Radiation protection, safety, professionalism and ethics

- Internal dosimetry, including MIRD (formalism), medical event assessment, fetal dose, units
- Personnel safety, including facility surveys and occupational dose limits, radiation protection principles, personnel dosimetry, ALARA
- Safety for the patient, family and public (including exposure pathways, breastfeeding, and pregnancy), shipping and waste disposal
- Shielding, including facility design/layout and personnel protection
- [Professionalism and ethics](#)

2. PET and hybrids

- Radionuclide production and characteristics
- QC procedures, including ACR/TJC/NEMA and acceptance testing, artifacts
- System principles, image fusion, random coincidences, scattered radiation, dead-time
- Quantitative PET, including SUV
- Image reconstruction, including attenuation correction, iterative reconstruction, filtered back projection

3. Single photon imaging systems including scintillation cameras, solid state cameras, and hybrids

- Radionuclide production and characteristics for SPECT and planar imaging
- QC procedures, including ACR/TJC/NEMA and acceptance testing, artifacts
- System principles, including scintillation cameras, solid state cameras, collimators, image fusion, system characteristics
- Dynamic imaging, renograms, cardiac function, ejection fraction, tracer kinetics, lung shunt fraction
- Image reconstruction, including scanograms, attenuation correction, filters, edge enhancement, smoothing, unsharp masking, segmentation

4. Radiation measurements, including dose calibrators, well counters, survey meters, thyroid probes

- Radioactivity measurement, including dose calibrators, well counters, thyroid uptake probe, survey meters
- Statistics, minimum detectable activity
- Radiation detectors, including survey meters, dead-time, personnel monitoring
- Quantitative measurements, including calibration
- QC procedures, including use of chi square, energy resolution, counting efficiency, geometry, linearity accuracy

5. Clinical procedures

- Radionuclide therapy, including facilities, release criteria, radionuclide production
- PET and hybrids
- SPECT and hybrids, including gamma cameras
- Radiation dosimetry, including risk, radiation protection, and CT dose
- Radiopharmaceutical usage, thyroid imaging/uptake, informatics, display performance, miscellaneous