



DELAWARE VALLEY SOCIETY FOR RADIATION SAFETY

A Chapter of the Health Physics Society

Preliminary Presentation Information **Rob Forrest Memorial Medical Health Physics Symposium** **June 7, 2019**

Production of Medical Radionuclides Using High Energy Accelerators, Dr. Cathy S. Cutler, Ph.D., Director, Medical Isotope Research and Production (MIRP), Brookhaven National Laboratories

In 1931 Ernest Lawrence invented the cyclotron and with it the ability to produce radioactive isotopes of interest for biological applications. Since that time major advances have enabled the production of small compact cyclotrons to be installed at hospitals and pharmacies supporting the supply of short-lived radionuclides around the world. In the 1970's and 80's major accelerator facilities operating at 100 MeV and higher were installed in many of the national labs and used for production of radionuclides at much higher energy values and then can be achieved on the small compact machines. These high energy accelerators play a critical role in supplying radionuclides such as Sr-82 used in Sr-82/Rb-82 generators for cardiac imaging. They continue to be upgraded to further production yields by installing beam rastering systems that have allowed higher intensities and thus higher production yields. Demand for isotopes that can be produced by these systems have also increased. Linear accelerators such as the one at Brookhaven National Laboratory when operating at maximum proton energy of 200 MeV can have simultaneous production of several medically relevant isotopes. Among those are Ac-225 (T_{1/2}=10.0 d), Cu-67 (T_{1/2}=64.83 h), Se-72/As-72 (T_{1/2}=26 h), Sr-82/Rb-82 (T_{1/2}=1.26 min) and Ti-44/Sc-44 (T_{1/2}=3.97 h). Production of these novel radionuclides and recent enhancements will be presented.

CT Dose Descriptors their Inherent limitations, Accreditation requirements and Applicability to Leap Frog Reporting, Ed Goldschmidt, M.S., DABR, Radiation Safety Officer and Diagnostic Medical Physicist, Cooper University Hospital

An overview of Computed Tomography radiation dose descriptors will be presented along with their inherent limitations. The clinical review of these dose descriptors as required by the Joint Commission, American College of Radiology and some states will also be discussed as well as Pediatric CT dose Leap Frog reporting.

Nuclear Plant Decommissioning- Challenges and Opportunities or How to Spend a Health Physics Career Transitioning from Operations through Decommissioning, Dr. Eric M. Goldin, Ph.D., CHP, President-Elect, Health Physics Society

Many US nuclear power plants are preparing for retirement due to aging and market forces. Some ceased operations in recent years, some retired decades ago. Commercial nuclear power plant decommissioning presents many challenges for radiation safety professionals, many of these challenges are not typical for operating power plants. Radiation protection controls apply to everything from the cutup of highly activated reactor internals to the measurement of environmental levels of radionuclides in soil.



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Targeting a Genomic Biomarker for Imaging Urothelial Cancer, *Dr. Mathew Thakur, Ph.D. FSNMMI, FNAI, FACNM, FICNM, FARR Director, Laboratories of Radiopharmaceutical Research and Molecular Imaging Professor of Radiology, Radiation Oncology and Urology, Thomas Jefferson University*

For early and accurate diagnosis of urothelial cancers, histologic examination, which requires tissue extraction, remains a gold standard. Not only tissue extraction is an invasive and a morbid procedure, but more than 66% of the time, it finds benign pathology. We have designed, synthesized and validated a 27 amino acid peptide that has a high affinity for VPAC1. Labeled with Cu-64 and administered intravenously, the biomolecule (Cu-64-TP3805) detects PCa with >95% sensitivity by PET imaging.

Digital Dose Creep and DEP's New CR/DR Regulation, *Ken Hoffman, Health Physicist II, PA DEP*

In the last few years, PA DEP inspectors have seen an alarming increase in patient dose for facilities that utilize CR/DR radiographic imaging systems. The speaker will offer examples of how these instances occurred and how facilities can prevent them from occurring in the future.

MRI-Guided Radiation Therapy, *Justin Turpin, Elekta, Director of Adaptive Radiotherapy Solutions*

The MRI Linac concept has been first presented by UMCU group in 2002 during a symposium about Image Guided Radiotherapy. Few of the technical challenges have been highlighted and studies have begun. In 2004 a more detailed concept has been presented including additional details about MRI modifications (main magnet, split gradient coils) and linac characteristics. Technical challenges (effect of magnetic field to dose, adaptive planning) have been highlighted. Elekta has received CE, FDA in 2018 and Health Canada in early 2019 and has been treating patients now globally.

Dental Cone Beam Computed Tomography and DEP's new CBCT Regulation, *Ken Hoffman, Health Physicist II, PA DEP*

For the first time, dental facilities that have a CBCT unit are required to have a physicist perform an annual evaluation of the unit. The presentation will outline the challenges physicists may encounter when performing the evaluation and offer possible solutions.

Missing Category 3 Radioactive Material Drill – A hospital working together to be prepared for the worst, *Eric Soltycki, MS, Radiation Safety Officer, Samantha Lockerby BS, RT(N)(CT), Einstein Medical Center Philadelphia*

A hospital with no Category 2 sources heard about those with Category 2 or above sources making emergency management and missing RAM plans including retrofitting, T&R, and working with law enforcement. After dealing with mass hospital power outages causing security issues, kinks in a multi-level security system for an HDR storage room, and a near miss "incomplete" Y-90 delivery created a need to prioritize missing RAM plans. We went through the process of evaluating risk scenarios, creating a missing RAM policy and planning a future drill.