

Spring 2023

March

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The Wavelength ~

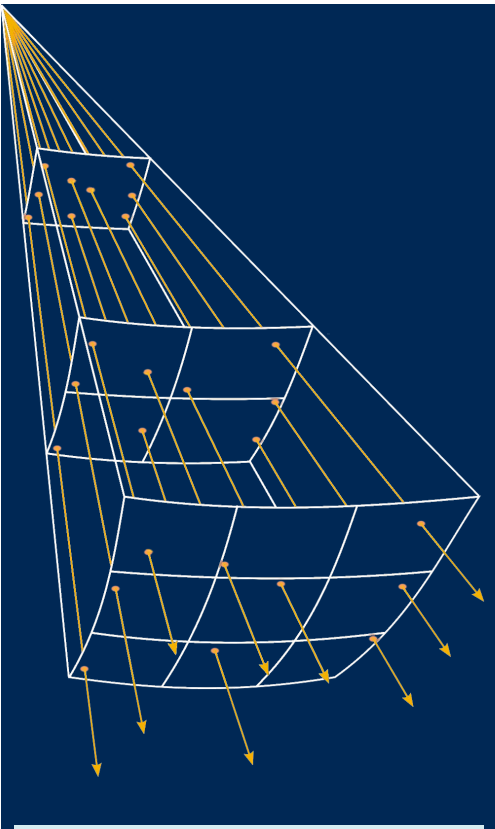
WVURSD Newsletter

New Radiation Safety Officer

The WVU Radiation Safety Department is pleased to announce that Stephen Root, former manager, has been promoted to Co-Director and Radiation Safety Officer (RSO). With over twenty years of radiation safety experience at WVU, Steve has demonstrated a deep understanding of the importance of radiation safety and is committed to ensuring our institution meets, and exceeds, the regulations set forth by the Nuclear Regulatory Commission (NRC) and West Virginia Radiological Health Program (WVRHP). Steve will continue to oversee day to day operations of the department, in addition to providing continual excellence in customer support to all stakeholders involved in radioactive material use. We are confident that Steve will excel in this new role and look forward to the continued success of our radiation safety program under his leadership. Please join us in congratulating Steve on this well-deserved promotion!

Radioactive Materials Licensure

The Nuclear Regulatory Commission (NRC) has regulatory authority over the possession and use of radioactive materials in medical and academic institutions. The NRC grants authorization for possession and use of these radioactive materials through a licensing process. Such licenses are held by both WVU and WVU Hospitals allowing the use of radioactive materials for research and medical purposes. Submission of license amendments and renewal applications are periodically required to maintain these licenses. The Radiation Safety Department assists WVU and WVU Hospitals in maintaining these licenses by preparing the license amendments and renewal applications for submission to the NRC. Recently, three separate radioactive materials licenses were renewed by the NRC. The WVU Cyclotron license expires on 8/31/2035, the license for WVU expires on 9/30/2036, and the WVU Hospitals license expires on 9/30/2037. Additionally, the NRC has amended all three licenses recognizing Stephen Root as the Radiation Safety Officer.



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Changes to the On-Call Contact System

Radiation Safety has switched its on-call system, from a pager-based system to an on-call phone number. This will take you directly to the on-call specialist's cell phone. The new on-call number is (304) 293-6430.

Cutting Edge Therapies

Lutetium-177 (^{177}Lu) has seen a marked increase in use as a targeted radionuclide therapy in recent years. It was first used at J.W. Ruby Memorial Hospital in 2018 as a treatment for gastroenteropancreatic neuroendocrine tumors (GEP-NETS) under the trade name Lutathera[®]. The isotope has a number of benefits, including its short biological and physical half-life, limited penetration in tissues, and ease of production in existing reactor architecture. In July 2022, the WVU Cancer Institute began offering another targeted therapy using ^{177}Lu , named Pluvicto[®]. Pluvicto[®] is used to treat castration resistant metastatic prostate cancer and can be administered in an outpatient setting. The WVU Cancer Institute was the first in the state to implement the new treatment for prostate cancer. Other promising uses of ^{177}Lu are being studied, including use in radio synovectomies by way of targeted injections into joint lesions, as well as treatment for other types of cancer. As further uses of this isotope are researched, WVU Medicine will continue to add promising therapies to its considerable catalog of care options.

PET/CT Undergoes Transformation

The WVU J.W. Ruby Memorial Center for Advanced Imaging PET/CT department will be upgrading both of its scanners to provide better diagnostic imaging services. The new scanners are expected to offer faster and more accurate results, enabling physicians to make timely and informed decisions regarding patient treatment plans. The upgraded equipment also features improved software that allows for enhanced image reconstruction and more detailed visualization of bodily structures. The PET/CT center's commitment to investing in the latest medical technology is a testament to their dedication to providing the best possible care for their patients. With the new scanners, the PET center will continue to be a leader in the field of medical imaging, providing cutting-edge diagnostic services that benefit patients and physicians alike. The process is expected to take a few months, and both machines will be replaced, one after the other. While one machine is being replaced, a mobile scanner will be available to maintain patient throughput.

Radiation Fact:

Your cellphone uses microwave radiation to communicate with a carrier's network, which is nonionizing radiation. No definitive link has ever been found between cellphone use and cancer incidence. ^[1]

[1]: [NIH, 2022](#)

Welcoming a New Researcher: Bradley Webb

The Webb lab investigates the cell biology of metabolic enzymes, with a current focus on understanding how inborn errors of amino acid metabolism in lysosomes contribute to blinding diseases. Lysosomes are crucial components of cellular metabolism, functioning as catabolic hubs and playing key roles in nutrient sensing and metabolic signaling. Mutations and deletions of lysosomal amino acid transporters, including SLC7A14, have been identified as causative genes in retinitis pigmentosa, a blinding disease. However, the specific mechanisms by which dysregulation of lysosomal amino acid metabolism leads to vision loss are not yet fully understood. The lab aims to determine the role of SLC7A14 in retinal health and how mutations in this gene cause blindness. As a first step, they are working to identify the cargo transported by SLC7A14, which is currently one of the few remaining orphan transporters in the human genome. They are developing a transport assay to measure lysosomal uptake of radioactive ³H-amino acids. By elucidating the molecular mechanisms regulating lysosomal amino acid metabolism in retinal cells, they hope to identify potential therapeutic interventions for blinding diseases.

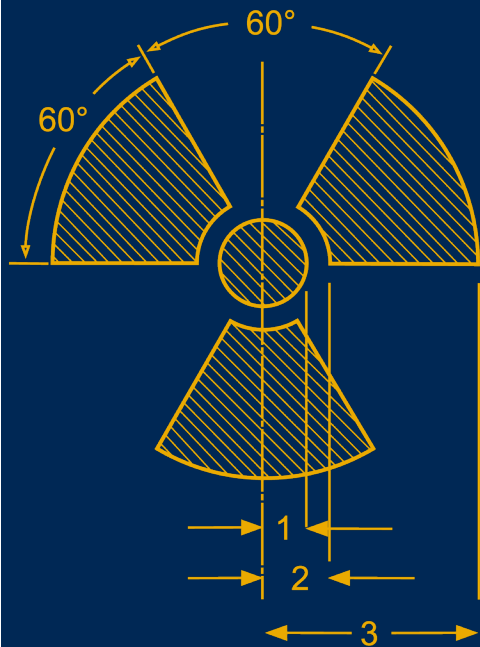
Enhancing Fluoroscopy Safety

The Joint Commission adopted a formal Sentinel Event Policy in 1996 to help hospitals that experience serious adverse events improve safety and learn from those events. A sentinel event is a patient safety event that results in death, permanent harm, or severe temporary harm. The Joint Commission (TJC) recently updated their policy regarding a sentinel event involving the use of fluoroscopy. Previously, a fluoroscopy case would be considered a sentinel event if the patient received a dose that exceeded 15 Gray to a single skin field. The TJC redefined the policy as fluoroscopy resulting in permanent tissue injury when clinical and technical optimization were not implemented and/or recognized practice parameters were not followed. Since the new definition, which took effect on January 1, 2022, is based on observed tissue reaction rather than a dose threshold, a process needed to be in place to identify patients who are at risk for radiation skin injury following a fluoroscopic procedure. Therefore, the Radiation Safety Department proposed a new policy to identify at risk patients and outline procedures for conducting patient follow up and case review. This policy titled 'Identification and Review of Potential Sentinel Events with Fluoroscopically Guided Interventions' has been included in the WVUH Policy and Procedure Manual, Policy No. 12563. Departments will need to follow this policy if performing fluoroscopy services.

Radiation Fact:

The Banana Equivalent Dose (BED) is an informal measurement of ionizing radiation, and is about 0.1 μSv of additional radiation [2]. This comes from a banana containing ^{40}K , one of the predominant radioisotopes in plant tissues. A chest CT delivers 70,000 BED of radiation.

[2]: [Mansfield \(LLNL\), 1995](#)



Cyclotron Upgrade

West Virginia University recently upgraded its production cyclotron. The first phase of the upgrade was floor refinishing so the cyclotron operators can move the shields with less turbulence, leading to faster and more efficient maintenance. The next phase, upgraded the operational machinery of the cyclotron itself. GE facilitated the machine upgrade which increased reliability as well as generating higher production yields. This will ultimately increase our reliability and consistency for our partners. It will maximize efficiency in our dose drawing with the increased activity in a shorter amount of time. This will further allow our facility to optimize the dispensing process and dispatch doses to multiple sites/departments more efficiently.

New Authorized Users

The Radiation Safety Department would like to welcome the following Authorized Users (AUs):

Dr. David Clump currently serves as Professor and Chair of the WVU Radiation Oncology Department. Dr. Clump earned his MD from WVU and completed his Radiation Oncology Residency at the University of Pittsburgh. He previously served as Assistant Professor at the University of Pittsburgh before returning to WVU. Dr. Clump is an Authorized User for HDR and LDR Brachytherapy and serves as a member of the WVU Radiation Safety and Human Use Committees.

Dr. Sarah Singh currently serves as Assistant Professor of the WVU Radiation Oncology Department. Dr. Singh earned her MD at Augusta University and completed her Radiation Oncology Residency at WVU. She is currently an Authorized User for HDR and LDR Brachytherapy and Gamma Stereotactic Radiosurgery.

Dr. Wang currently serves as Assistant Professor and Section Chief of Molecular Imaging for the WVU Department of Radiology. He earned his MD from Nanjing Railway Medical College in China. Dr. Wang completed his Nuclear Medicine Residency at Johns Hopkins University. He previously served as Assistant Professor of Nuclear Medicine at the University of Arkansas. Dr. Wang is currently an Authorized User for diagnostic and therapeutic use of unsealed radioactive material.

Dr. Maximilian Schellinger currently serves as Assistant Professor for the WVU Department of Radiology. He earned his MD at Georgetown University and completed his Diagnostic Radiology Residency and Interventional Radiology Fellowship at Medstar Georgetown University Hospital. Dr. Schellinger is currently an Authorized User for Yttrium-90 microspheres.