

RAD  NEWS

Jan Feb March '16

New Medical Physicist Joins the VTH

The RCO Interviewed Dr. Del Leary

The Radiation Control Office works with several departments at the Veterinary Teaching Hospital to ensure personnel safety during the delivery of radiation therapy and diagnostic imaging. The VTH recently hired a new medical physicist, Dr. Del Leary, to work directly with the staff and perform quality assurance and quality control. In other words, his job is to ensure that all medical imaging and radiation equipment functions at optimal levels, and that procedures and treatments are accurately calibrated and, therefore, safe. Medical physicists are the experts in radiation delivery mechanisms for the treatment of cancer, and the development and advancement of medical imaging techniques.

Dr. Leary grew up in Winnipeg, Manitoba Canada where he played AAA hockey and guitar for a band that performed local gigs. He attended the University of Winnipeg and completed his undergraduate in physics. After graduating, Dr. Leary was interested in combining science and music. He completed a masters degree at the Memorial University of Newfoundland while collaborating with the Ultrasound Lab at the University of Manitoba. He then worked for the Canadian Space Agency for a year using Ultrasound to study the dynamics of particles in a micro gravity environment.

Dr. Leary then moved to Oxford Mississippi and accepted a position at the National Center for Physical Acoustics. This was his first position involving the biomedical application of physics. He went on to complete his PhD in physics at Dalhousie University which was a combination of biomedical engineering and physics. A post-doc and a two year residency followed in medical physics at Nova Scotia Health Authority, a human patient hospital, before accepting his new position here in Fort Collins at the VTH.

RCO: What is a typical day of work for you?

Leary: My day varies depending on the workload. The clinic is my priority. If anything is not working correctly I am the first person called. I consult on cases and respond to plan questions for radiation treatment. I have weekly quality assurance sessions and am currently working on shielding evaluations for the accelerator room renovations. I am involved in various research projects: my targeted research is toward improved radio-sensitization of tumors,



(Pictured from left: Dr. Del Leary, Wendy Mullins, Sarah Bruns, Dr. Kelsey Pohlmann, Dr. Susan LaRue (head), Dr. Hiroto Yoshikawa, and Dr. Benoit Clerc-Renaud.)

novel beam design, image guided radiation therapy and superficial x-rays for horse sarcoids to name a few. I also teach two classes that alternate in the Fall semester: Radiation Therapy Physics and Physics of Diagnostic Imaging.

RCO: What do you like most about your job?

Leary: It is hard to pick one aspect because I enjoy the research and the teaching and the clinical load - that always provides new and interesting challenges. So I would say the best thing is that I enjoy having that mix. I really love practicing at the VTH because my professional reward is threefold: I often get to see the clients joy from the improved health of their pet, I get to see the benefit of the therapy on the animal patient, and I work in a capacity where novel animal therapies can be adapted to benefit human patients.

RCO: And the most challenging aspects?

Leary: Time management is crucial. I try to avoid getting bogged down.

RCO: What groups/specialty teams do you work with at the VTH?

Leary: My position is an integral part of the Radiation Oncology department. We work closely with the Medical Oncology department that uses

New Medical Physicist Continued

chemotherapy and surgery to determine, based on the severity of the cancer, how to mix the therapies to get the best results. I also have a very close collaboration with the Radiology department to ensure that the images taken during the planning set up compliment our treatment planning system. We collaborate to ensure everything is set up correctly and that the image quality is optimal.

RCO: Do you see your role becoming more critical as medicine evolves towards molecular based imaging and therapy?

Leary: The imaging is improving all the time and we do already fuse CT scans with PET or MRI to better assess the tumor activity and to delineate the surrounding tissue. We use the MRI to better resolve soft tissue, especially in head and neck cases. But we also occasionally fuse with PET which is often referred to as functional imaging since it is a measure of the metabolism which is higher in cancerous cells. This is very useful because sometimes we have false positives or negatives where tissue can look cancerous, but if it is not metabolizing at a high rate, it is unlikely to be cancerous. Similarly, we can have tissue that appears normal, but is highly metabolizing and 'avid' within PET imaging and is potentially cancerous.

Medical physicists are presently in high demand and I think our role will continue to be critical because it is a very rapidly evolving field such that new advancements that come along will provide new information and generate more sophisticated tools ultimately leading to better diagnostics and treatment.

RCO: Would you recommend the career to a physics graduate?

Leary: Absolutely, because it is a very rapidly

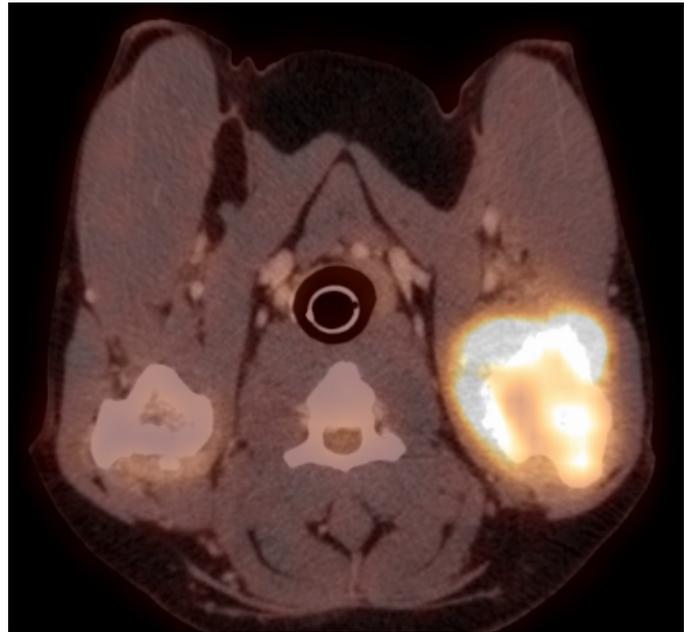


Figure 1. Fused image combining CT with PET imaging. The PET gives metabolic activity information and shows up as a bright area superimposed (or fused) to the CT image which gives high resolution information about the anatomy. Together radiation treatment can target cancerous areas while sparing normal tissues with high precision and accuracy.

evolving field with many new exciting advancements and technologies. There has been a shortage of trained medical physicists for some time, but the unfortunate thing about lengthy academic training is that you have to project what the demand will be after training to be a medical physicist which can take well over a decade. So with this, I would encourage those to pursue the profession that have a real interest in the field rather than considering it an opportunistic market. It is a long road, but I have found it to be very worthwhile.

Lung Cancer in Smokers More Accurately Detected Using CT Scans than X-Rays

Article By Daniela Semedo, PhD for Radiation Therapy News February 24, 2016

A comprehensive lung cancer screening program that uses CT scan technology developed at Intermountain Medical Center in Salt Lake City may provide smokers with a more precise way of determining if they have lung cancer.

The screening program drew on the results of the National Lung Screening Trial, a comprehensive trial in which CT scans were compared with typical chest X-rays for their accuracy in detecting lung cancer. Trial results demonstrated that lung cancer patients who were screened with CT scans had a 15 percent to 20 percent reduced risk of dying than those

screened with standard X-ray.

"Taking results of a research study and applying them to the real world is extremely hard to do," Denitza Blagev, MD, a pulmonologist at Intermountain Medical Center, and one of the program leaders, said in a news release. "But the Lung Cancer Screening Program at Intermountain Medical Center is a direct result of that effort, and because of the best practices that came from this research, we were able to diagnose three people with early stage lung cancer in the program's first 18 months."

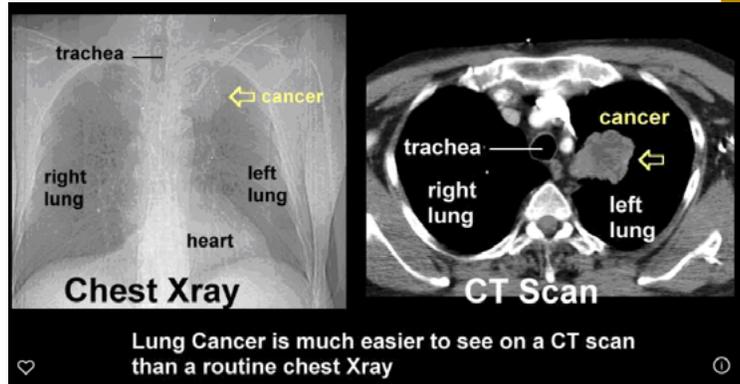
Lung Cancer Detection continued...

The findings were presented by Dr. Blagev and her colleagues at the American Thoracic Society International Conference, recently held in Denver, Colorado.

Researchers tested the screening method between September 2014 and March 2015. Initially, 375 patients received CT scans. Of these, 272 were eligible to remain in the program. Nineteen of the eligible 272 scans exhibited evidence of malignant lung cancer, of which 11 were confirmed as malignant lung cancer and three considered to be early stage cancers.

“Our goal is to save every life that we can. Our results are comparable to the National Lung Screening Trial, in which it was deemed a success if they prevented just one cancer death for every 320 patients screened. The program we created from this study detected three early stage lung cancers ... which is incredible,” said Dr. Blagev.

All patients who took part in the screening program were at high risk for lung cancer, with a smoking history of at least 30-pack years (equivalent to smoking a pack a day for 30 years), and all were former or current smokers without any sign of lung disease.



“Results from the National Lung Screening Trial and from our program have shown that screenings are very effective and will greatly benefit our patients going forward,” said Dr. Blagev. “These results will also help our patients financially as well. As of February of this year, the Centers for Medicare and Medicaid Services (CMS) issued a statement about how they will cover the cost of screenings for lung cancer.”

In its statement, the CMS supported annual lung cancer screenings for adult current or former smokers who meet certain criteria.

What's New in Health Physics

Conferences/Workshops

48th Annual National Conference on Radiation Control
Lexington, KY
May 16-19, 2016 [more info >>>](#)

Landauer Inaugural Dose Optimization Symposium
Chicago, IL
May 26, 2016 [more info >>>](#)

61st Annual Health Physics Society Meeting
Spokane, WA
July 17-21, 2016 [more info >>>](#)

Radiation Do's and Don'ts

Do Look for the New Postings for Benchtop Containers with Radioisotopes.



Attention

The use of benchtop containers with radioisotopes may now require specific labeling if they will be accessible to any lab personnel.

Contact the RCO to consult on labeling if you have any of these isotopes in quantities within your benchtop containers:

Isotope	Limit (µCi)
C-14	1000
Ca-45	100
Cu-64	1000
H-3	1000
I-125	1
I-131	1
P-32	10
P-33	100
S-35	100
U-238	100

Radiation Control Office 1-4835

As the bi-annual lab inspections occur the RCO will be providing activity limits for the new labeling requirements for benchtop containers.