



# New England Chapter E-Journal of Nuclear Medicine Technology

VOLUME 15, ISSUE 1

FALL 2019

## *Plan to Attend*

*The Greater New York and New England Chapters of  
the SNMMI are pleased to announce the:*

## 33rd Annual Northeast Meeting

Stamford Hilton Hotel  
Stamford, CT

November 8-10, 2019

See program detail at the end of this journal



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For CEU meeting announcements, job postings and  
general information on the  
New England Chapter Technologist Section

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### **Future Meetings**

#### **51st Annual Spring Symposium**

April 3rd & 4, 2020  
Portsmouth, NH

## President's Report by Lauren Shanbrun MS, CNMT, RT(N)(CT), FSNMMI-TS

Happy Fall! I hope everyone had a great summer and found some time to relax and enjoy the sunshine and heat. The summer tends to be a bit slower for the executive board but we are now vamping up our efforts to plan the 51st Annual Spring Symposium in Portsmouth, NH on April 3 and 4, 2020. Let me take this opportunity to update you on what has been going on since our last meeting in April 2019 and some future events that may interest you.



The SNMMI Annual Meeting was held in Anaheim, CA from June 22-25, 2019 and the New England Chapter was well represented. I represented the chapter as President and National Council Delegate (please see below for the NCD report) but there were a lot of familiar faces from New England, both technologists and physicians, at the meeting who presented, attended, chaired committees, served on committees, and judged posters or abstracts. We even had 5 students from New England present during the student abstract sessions and one of them, Kathryn Beaulieu from RIH School of Medical Imaging, won 1st place in the student oral abstract presentations category. The SNMMI Mid-Winter and ACNM Annual Meeting will be held January 23-25 in Tampa, Florida. The SNMMI 2020 Annual Meeting will be held June 13-June 16th in New Orleans, Louisiana. NECTS will be represented at both meetings and we encourage our members to attend these meetings.

The 33rd Annual Northeast Regional Scientific Meeting will be held November 8-10, 2019 in Stamford, CT. The program offers a variety of current topics in Nuclear Medicine. Unfortunately, I not able to attend this meeting because I will have a newborn at home but Matthew McMahon, President-Elect, will be there representing the NECTS Executive Board.

The NECTS executive committee had a conference call in early September to begin planning the program for the 51st Annual Symposium. We are excited to be back in Portsmouth, NH. We were there 5 years ago and had a great turn out. We are hoping to have the same response this time. If you would like to help plan the meeting or wish to present at the meeting please contact me: [lshanbrun@lifespan.org](mailto:lshanbrun@lifespan.org). I am hoping to put together a program that is diverse in topics yet current to the needs of the profession. I hope you have a great fall and I look forward to serving as NECTS President.

Best,  
Lauren Shanbrun

## President-elect Report by Matthew McMahon, MS, CNMT RT(CT)

Greetings fellow New England Chapter members. A lot has happened in the world of Molecular Imaging, both at the Chapter level here in New England as well as nationally within the Society, since you elected me President-Elect this past spring. We had a wonderful and special Spring meeting in Windsor, CT as the Chapter Celebrated our 50th year. The Executive Board did a tremendous job in their planning; compiling a plethora of historical artifacts, strong attendance by many of our past Presidents and a warm reception for all of our Chapter technologists. New England has always been at the forefront of the Nuclear Medicine Technologist Section, and both Lauren's my goals aim to keep us in that position as we move our Society forward.



We were welcomed with some "June Gloom" in Anaheim, CA this summer for the Annual meeting however, it was very productive both in terms of the level of talks presented and the accomplishments made as part of the National Council of Representatives and Technologist Executive Board. In my elected capacity to the National Technologist Executive Board, I am given the opportunity to represent our Chapter, not only in the budgetary decisions of our collective society but also as we shape the future of our field. There are many exciting things happening in our profession as we all know, and it is our Societal aim to ensure that our technologists receive everything they need to excel in the ever-changing environment. Both the Executive Board and NCOR will be convening again this January in Tampa. If you have any concerns that you would like me to take to either group, please do not hesitate to reach out.

I am very much looking forward to attending the Northeast Regional Meeting in Stamford in early November. The schedule of talks looks to be extremely thought provoking and it also grant me the opportunity to network with our physicians and neighbors from the Greater New York Chapter.

Finally, we are already looking forward to our upcoming Spring Meeting in Portsmouth, New Hampshire. I will be working closely with Lauren and the remainder of our Executive Board to ensure that our meeting in the most productive and meets your needs as technologists. We take your feedback very seriously when organizing our educational program, so please continue to voice your opinions on topics to present. We are also expecting a strong turn out from our students again this year, along with the presentation of their own research. Our students are our future, and we must strive to provide them with every opportunity to grow and advance both in their careers in the clinic as well as their involvement within the Society.

I am very much looking forward to seeing everyone in Portsmouth.

Matthew McMahon

President-Elect

matthewconormcmahon@gmail.com

## Past President's Report by Tony Sicignano, BS, CNMT, RT(N), FSNMMI-TS

Hello to all my New England fellow professionals. As Nuclear Medicine Technologists, we continue to strive for knowledge and participation. Our New England Chapter provides the opportunity for both throughout the year. Our Annual Spring Symposium offers the New England NMT those credits, which help fulfill the requirements for our credentials and in many cases our occupational licenses. Know that our Executive Committee is already working on building another great program for our 2020 meeting.



One of the special duties of the Past-President is to build a slate of potential candidates to fill those positions on the Executive Committee that will be available this year. Those positions are that of the President-Elect and the Treasurer. Matt McMahon, our current President-Elect, will become the New England Chapter President come our spring 2020 meeting. April Mann, our current Treasurer, will be completing her term of office come this spring 2020. I want to thank both Matt and April for their dedication to not only our Chapter but to you the NMTs of New England. They have served you well.

Having said this, I am now asking you to please consider submitting your name or that of a colleague for either of these two positions. Our Chapter needs to continue its strong and dedicated leadership. Our Chapter has a long history of participation and professionalism. We would all like to continue this reputation.

The requirements for both positions are as follows:

**President Elect** (3-year term including President-Elect, President, and Past-President)

*Article VI, Section IIIB of the NECTS Bylaws*

President-Elect of the NECTS performs the duties that the title reasonably indicates. In the case of temporary or permanent absence or disability of the President, the President-Elect shall fill the functions of the President. The President-Elect shall also act as the Scientific Program Chairperson. The President-Elect will assume the Presidency in the following year.

**Treasurer** (2-year term)

*Article VI, Section IIID of the NECTS Bylaws*

The Treasurer of the NECTS shall prepare the budget; conduct monetary affairs including the collection of Membership dues via the SNMMI and the compilation of the Membership roster. The Treasurer may allocate NECTS financial resources as authorized by the President. The Treasurer will also prepare monthly financial resources for the President and financial statements to be presented at the annual Business Meetings.

If you are interested please feel free to contact me at [a0712@sbcglobal.net](mailto:a0712@sbcglobal.net). Even if you may have some questions about the positions or their duties, please don't hesitate to reach out to me. I will be happy to have this conversation with you.

May you all enjoy this fall season and the upcoming holiday season. I look forward to hearing from you.

Regards,

Tony Sicignano, BS, CNMT, RT (N), FSNMMI-TS

Past – President

Nominations Chair

## National Council Delegate Report by Lauren Shanbrun MS, CNMT, RT(N)(CT), FSNMMI-TS

The Society of Nuclear Medicine and Molecular Imaging Technologist Section (SNMMI-TS), Executive Board, National Council of Representatives (NCOR) and various committees have been hard at work on new projects and initiatives to benefit technologists and the field of Nuclear Medicine. The NCOR meets monthly via conference call and has 2 in-person meetings- one at the Mid-Winter Meeting and one at the Annual Meeting. The most recent meeting was held during the SNMMI Annual Meeting in Anaheim, CA. Moving forward our NCD representative for New England will be Kathy Krisak.

Here is a highlight of the NCOR meeting in Anaheim:

### International Activities

- This is the 3rd year that students from various NMT programs across the country have studied abroad. Students apply through their school and it is funded by the student or by financial aid/scholarship programs. Trips have included the United Kingdom, Portugal, and Australia. Relationships with international organizations has enabled the SNMMI-TS to gain access to hospitals in different countries and support study-abroad trips.
- SNMMI-TS has been well represented at international meetings- The European Association of Nuclear Medicine and the Korean Society of Nuclear Medicine.

### *- Issues that the US faces are similar around the world*

### Imaging Scientist

- The SNMMI-TS recognizes that as technology advances current technologists are trained in advanced imaging through on the job experience and vendor application training, but this will create a need for advanced level imaging technologists.
- The task force, comprised of SNMMI-TS representatives, ASRT, SMRT, AHRA, ARRT, NMTCB, JRCNMT, JRCERT, an imaging PhD, a program director and an imaging director is working on how to prepare the field for the future noting that there must be collaboration between organizations and the need of consistency in educational programs.
- There was an in-depth discussion during the NCOR meeting regarding this concept with many questions and vantage points from all representatives present. The task force will review the discussion and input from NCOR and will update the NCOR during future meetings.

### Membership

The membership committee recognizes that most professionals aren't officially settled into their profession until 5 years out of school and that most students signed up in the "transition" category were not transition to technologist members. Given this information they presented an action to change the Technologist Transition Category from a 1-year transition to a 5-year transition with 50% cost for membership dues. With this new structure they hope is that as the students become technologists they will really see the benefits of being a SNMMI-TS member and continue to do so. This was approved by NCOR and then approved by the SNMMI-TS Executive Board. Please see the SNMMI website for details.



## National Council Delegate Report by Lauren Shanbrun MS, CNMT, RT(N)(CT), FSNMMI-TS

### NCD Report Continued

#### Advocacy

- The committee has been active and working to push through licensure.
- An update was provided on USP825 and the advocacy efforts on behalf of all members to educate on the new regulations was presented.
- An update was provided on the proposed changes to the NRC Training and Experience Requirements.

To conclude my NCD report I would like to take this opportunity to assure you that the SNMMI and SNMMI-TS always keep their members and the best intentions of the field of Nuclear Medicine at the forefront of what they do. It was obvious at the NCOR meeting that we are trying to stay ahead of the curve in an everchanging healthcare field.

## Educator's Committee Chair Report by Daniel Tempesta, BS, CNMT, R.T.(N)(CT)

The student program was held on Friday during this year's spring symposium. A total of 32 students were in attendance, representing all six nuclear medicine programs in New England! Programs represented included Regis College, Massachusetts College of Pharmacy and Health Sciences University, Salem State University, University of Vermont, Gateway Community College, and Lifespan School of Medical Imaging.



Students spent the day participating in nuclear medicine review activities and completed a mock board exam to help them prepare for the boards. Twenty-five students had scientific abstracts accepted and all twenty-five presented their research in the form of academic posters, which were displayed in the technologist's section. At the end of the day the students were given the opportunity to join the tech section to participate in an interactive jeopardy game and also sit in on one of the tech section lectures to see what the conference offers to technologists.

This coming April we are looking to continue with having the student program on Friday at the conference. Program directors should be receiving details over the winter about the student program for this coming spring and we hope you will encourage your students to attend!

I would like to take a moment to thank Lauren Shanbrun for her continued assistance with the student program and thank you to all the program directors for promoting the symposium and encouraging their students to submit abstracts and become involved with the society. Your support is greatly appreciated!

Best wishes,  
Daniel Tempesta, BS, CNMT, R.T.(N)(CT)  
Secretary and Education Committee Chair

## Historian Emeritus Report by Leo Nalivaika, MBA, CNMT, FSNMMI-TS

Hello to all members of the NECTS. Summer has cruised by us very quickly and I hope everyone had a safe and enjoyable time. Now back into the fall it seems that the holidays will be approaching quickly.

The past annual meeting in April was an excellent meeting. Tony, Kathy and Jana who were some of the prime organizers, as well as members of the executive committee, a great job done by all. Celebrating fifty years of our organization was one that seemed to be a repetition of history....technologists continuing education. Our founders provided and followed a mission statement that we still hold and follow today. May our organization and future leader continue this mission in our technology.



I was happy to bring several items to the 50<sup>th</sup> (a truckload) to the meeting. I continue to request if you have any items, pictures and or materials to share. The best part of the historian's table was learning who was captured in some of the pictures. There was one picture I was wondering who these two people were. When I heard OMG from someone looking at the picture... mystery solved. There were also many of our members sharing memories either from earlier or more recent times at the meeting. Depending on meeting space I hope to continue sharing these materials with the membership at the meeting.

I look forward to our 51<sup>st</sup> meeting in the spring which will be held in Portsmouth NH. Planning is underway and historically this meeting has had great attendance.

Also the SNMMITS is planning their 50<sup>th</sup> celebration in June in New Orleans.

I hope to see you at one of the meetings, and all of my best to you.

Leo



## Meeting Planning Report NECTS-SNMMI- TS Spring Meeting 2020

**Dates: April 3rd and 4th 2020**

**Location: Sheraton Portsmouth Harborside Hotel, Portsmouth New Hampshire**

**Hotel Room Cost: \$144.00 a night Rooms Available from April 2nd – April 4th, 2020**

*All this information will be posted on our web page with a link for members to start booking rooms.*

The Sheraton Portsmouth Harborside Hotel is beautiful hotel for our meeting this Spring. The hotel boasts an ideal location in the heart of Portsmouth's historic downtown district on the Piscataqua River. Enjoy easy access to area attractions, such as the University of New Hampshire, the Naval Shipyard and Prescott Park, as well as quaint boutiques, local beaches and popular restaurants and breweries. After a full day, retreat to the comfort of the hotel rooms. When hunger strikes, there are so many restaurants within walking distance of the hotel. Stay fit by exercising at their fully equipped fitness center and swimming in their indoor heated pool .

Lectures will be planned for all day Friday and Saturday with a total of 14 CE's if possible, with a Radiation Safety Credit offered each day. We need speakers for this meeting along with moderators for the educational sessions on both Friday and Saturday. We are also looking for members who are interested in working the registration area this year. Please contact Lauren or me if you're interested in speaking or helping out at the meeting this year.

Happy Holidays

Kathleen Krisak CNMT

krsakkk@comcast.net







SNMMI's community of more than 15,000 professionals represents every aspect of nuclear medicine and molecular imaging, all working together to advance precision medicine around the world.

**And every year, SNMMI provides that community more than \$400,000 to advance nuclear medicine, molecular imaging and therapy, and the next generation of researchers!**

While Nuclear Medicine and Molecular Imaging Week is only 7 days, SNMMI wants to celebrate our members all year long. Explore the 2020 grants, awards, and scholarships that are [now accepting applications](#) and invest in your professional development this membership year!

## [Explore 2020 Grants](#)

*Remember, these are exclusive opportunities for SNMMI and SNMMI-TS [members only](#). We look forward to another great membership year!*

## 2019 Service Award Presented to Kathy Krisak



*It was with great pleasure that the 2019 New England Chapter Service Award was awarded to Kathy Krisak. Thank you Kathy for all you do for our profession nationally, internationally and especially for the New England Chapter.*

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## 2019 Spring Symposium Student Presentation Abstracts

The following pages are abstracts from the student presentations during the 2019 Annual Symposium.

Congratulations to all of our students and thank you to the program directors and volunteers!

# Ga-68 DOTATATE and In-111 Octreotide: A Comparison

Kyle Sullivan  
Yvonne Abate

*Regis College Nuclear Medicine Technology Program, MA*

Neuroendocrine tumors originate from neuroendocrine cells, which are cells found throughout the body that release hormones into the bloodstream. An older method, using In-111 Pentetreotide (Octreoscan), has been serving to visualize neuroendocrine tumors since 1989. Positron Emission Tomography (PET), also used for localizing neuroendocrine tumors, has emerged as an imaging modality with the use of Ga-68 Dotatate to evaluate these rare neuroendocrine diseases. Patients receiving either the Octreoscan or the Dotatate scan must yield all somatostatin receptor medication for the appropriate time period (time period is specific to facility), prior to performing this exam. Because the tumor uptake is dependent on this receptor binding, any somatostatin receptor medication that is not yielded will decrease uptake within these tumors, making them less visible to reading radiologists.

**Methods:** Several journal articles were reviewed pertaining to PET and neuroendocrine tumor uptake. Many case studies were performed, one of which a patient received both an Octreoscan and a Dotatate scan within a short period of time, showing vastly different results.

**Results:** The patient received an Octreoscan, showing 19 lesions. The patient then got a Ga-68 scan, showing the same 19 lesions with an additional 16 detected. The PET image showed a higher contrast and higher background- to- target ratio, making these additional 16 lesions visible to the eye. Ga-68 Dotatate showed improvements of locating and staging the extent of the disease. PET Imaging with Ga-68 Dotatate provides radiologists a higher resolution image than that of In-111 Octreoscan, allowing the patient to receive a precise diagnosis. The two procedures also differ in total study time, imaging time, injection to imaging time, and isotope energy. Due to the higher sensitivity, PET imaging has become the gold standard for neuroendocrine tumor patients.

**Conclusion:** Comparing the PET scan to the general nuclear medicine scan, there was an 84% increase of lesion detection. This increase can severely impact the treatment plans for the patient using Lutetium-177. Ga-68 Dotatate PET imaging will grow in time as it has shown to be the better option for the patient.

# Actinium-225: Targeted alpha therapy with tagged PMSA-617 markers a treatment for patients with castrate resistant prostate cancer

April Adams

*Salem State University, Salem, MA  
School of Nuclear Medicine Technology*

**Objective:** In 1899 Actinium was first discovered by a French chemist Andre-Louis Debierne who had separated the element from pitchblende residues left by Marie and Pierre Curie after they had extracted radium. The action of this radiopharmaceutical is currently being investigated as a targeted alpha therapy for prostate cancer metastases to the bone. When actinium-225 is attached to a protein or antibody, it will accumulate on the cancer cells where it emits its destructive alpha particles over a very short distance breaking the bonds in the specific DNA of cancer cells. This isotope is unique among other alpha emitters because of its short 10-day half-life. Having this short half-life limits the amount of time it remains in the patient's body and it gives physicians adequate time to prepare, administer, and wait for the radiopharmaceutical to reach the cancer cells before it acts. Early phase clinical trials have begun using the isotope when attached to PMSA-617 markers on tumor cells and have found positive antitumor activity using the therapy

**Methods:** Several articles were reviewed pertaining to the radiopharmaceutical actinium-225 focusing on its use as a TAT for castrate resistant prostate cancer. In this study 40 patients were injected with  $^{225}\text{Ac}$ -PMSA-617 at 2-month intervals with PSA blood levels being measured every 4 weeks. A PSMA PET/CT or SPECT/CT were prearranged for baseline imaging and evaluated 6 months later.

**Results:** 31 of the 40 patients were treated using the provided protocol. Five patients chose to discontinue the treatments. Four of these patients decided to discount treatments due to xerostomia (dry mouth). Of the total 38 patients who survived the 8 weeks, 24 (63%) showed a decline in more than 50% of their PSA results, and 33 (87%) had a PSA response to any amount.

**Conclusion:** In patients with castrate resistant prostate cancer undergoing TAT specifically with  $^{225}\text{Ac}$ -PMSA-617, researchers found a positive response with patients' PSA scores and antitumor activity. Researchers were able to assess the usefulness of this therapy on tumor growth and expansion. Slight adjustments to the protocol will further aide in the use of this radiopharmaceutical for the patient population.

Submitted by:  
April Adams



# Treatment of gastroenteropancreatic neuroendocrine tumors with peptide Receptor Radionuclide Therapy (PRRT), Lutetium Lu-177 Dotatate LUTATHERA®

Kiyo Akiyama

Gateway Community College, New Haven, CT  
School of Nuclear Medicine Technology

For the first time a radiopharmaceutical has been approved by the FDA for the treatment of gastroenteropancreatic neuroendocrine tumors (also known as GEP-NETs).

LUTATHERA® is indicated for adults with somatostatin receptor-positive neuroendocrine tumors of the midgut. Lutetium Lu-177 dotatate (LUTATHERA®) uses a form of targeted treatment called Peptide Receptor Radionuclide Therapy (PRRT).

**Method:** An extensive study was performed in the US as well as Europe testing the use of Lu-177 Dotatate LUTATHERA® vs. the use of octreotide LAR alone. 229 patients with well differentiated metastatic midgut neuroendocrine tumors were randomly assigned to either receive the Lu-177 Dotatate (7.4 GBq) every 8 weeks with long acting repeatable (LAR) octreotide, or octreotide LAR alone administered every 4 weeks (control group).

**Results:** At the cut-off date for the data's primary analysis the estimated rate of progression-free survival at the 20 month mark was 65.2% for the Lu-177 Dotatate group, and a 10.8 % in the control group. Giving the response rate in the control group 3%, whereas the Dotatate group had an 18% response rate. There were 26 deaths in the control group and only 14 deaths in the Lu-177 Dotatate group.

**Conclusion:** Treatment with Lu-177 Dotatate showed a much longer progression-free survival and a considerably higher response rate in comparison to the high-dose octreotide LAR treatment. This proved especially effective in patients with advanced midgut neuroendocrine tumors.

Submitted by  
Kiyo Akiyama

# Lutetium <sup>177</sup> PSMA radionuclide therapy for men with prostate cancer

Elizabeth M. Albers

*Gateway Community College, New Haven, CT  
School of Nuclear Medicine Technology*

The new direction that Nuclear Medicine is looking towards is tumor specific radiotherapies. This new method to treating cancer will benefit many people who are suffering from various tumor types. This type of therapy can help cure or reduce cancer or tumors without causing any significant damage to any one specific healthy organ. As iodine is well known for treating thyroid cancers Lutetium 177 has taken a step into the spotlight as the new therapeutic radionuclide to help treat different types of tumors. Lutetium is the new desired radionuclide due to its physical characteristics. Lu 177 is a medium energy beta emitter with a tissue penetration of <2mm and a long physical half- life of 6.73 days. With Prostate cancer being the most common type of cancer for men this new therapy could do wonders cutting back the death toll this disease has caused thus far.

**Methods:** PSMA stands for prostate specific membrane antigen. PSMA peptides are used jointly with Lu 177 to target prostate tumors. Early clinical studies have shown promising results with men who have had other therapies fail.

**Results:** The number of men who experience a >50% reduction in serum PSA (prostate-specific antigen) levels ranges from 30% to 70%, which compares well to the PSA response rates achieved by chemotherapy agents used in metastatic castration resistant prostate cancer. This process and these results are still in the early stages of clinical trials so various treatment techniques are being used. The dose and number of injections range between each patient. There is a need for more randomized trials to attain a more definitive result. With that being said there does seem to be a good response in men who have high levels of PSMA.

**Conclusion:** Lu 177 PSMA seems to have a big impact on the next step in treating prostate cancer. Specifically men with end stage prostate cancer have shown good results with low toxicity levels. The next step they plan is to conduct more trials to determine the rate of survival over time.

Submitted by:  
Elizabeth M. Albers

Comparison of 68Ga-PSMA-PET/CT to standard CT in the radiotherapeutic approach for prostate cancer.

MENSAH ASANTE, MCPHS UNIVERSITY, NUCLEAR MEDICINE

**Objective:** In the determined attempts to assess and come up with diagnostic and therapeutic marker for prostate cancer, Prostate specific membrane antigen (PSMA) appears to be a practical diagnostic and therapeutic agent for prostate cancer. Prostate specific membrane antigen (PSMA) is a protein membrane on all forms of prostate tissue and its presence in the body is an indication of prostate cancer. PSMA is considered the ideal target for prostate cancer due to its expression on prostate cancer and recent significant success in translating radiolabeled small molecule PSMA inhibitor for imaging and therapeutics. The clinical breakthrough in the field occurred with the introduction of gallium-labeled 68Ga-PSMA-PET/CT in 2011. This abstract is to argue that 68Ga-PSMA-PET/CT prior to radiotherapy impact the radiotherapeutic approach in a great way compared to standard CT. <sup>1,2</sup>

**Methods:** Between February 2014 and December 2017, a total of 172 patients received PSMA PET/CT before radiotherapy and were included in a survey. Twenty-two (13%) patients were referred for primary definitive radiotherapy, 51% (88/172) for PSA persistence and 36% (62/172) for PSA recurrence after radical prostatectomy. An experienced radiation oncologist, blinded to the CT and PET/CT imaging results, decided on the radiation treatment management of all patients based on the clinical and pathological variables. The potential increase in diagnostic accuracy, and the subsequent change of radiotherapeutic approach was documented separately for PET/CT versus CT. <sup>1</sup>

**Results:** In all, detection rate in 68 Ga-PSMA-PET/CT was 70%. Patients with pre-PSMA PET/CT PSA-level (88%) had significantly more often PET-positive results. Overall, PSMA PET/CT revealed a total of 171 lesions, PET alone 156 and CT alone 85. For all patients a continuous diagnostic increase in positive findings was observed for primary tumor/local recurrence (CT: 18% vs. PET/CT: 37%), pelvic lymph node (CT: 21% vs. PET/CT: 44%) and distant metastases (CT: 7% vs. PET/CT: 19%) when comparing CT vs. PET/CT. Compared to CT, the combination of PET/CT information resulted in a change of treatment in 107/172 (62%) patients, i.e. 8/22 (36%) patients prior to any treatment, 31/62 (50%) with PSA recurrence and 68/88 (77%) with PSA persistence. Comparing the different radiotherapy indications with each other, there was a higher change of management in postoperative patients vs. patients prior to any treatment. <sup>1</sup>

**Conclusion:** Considering the amount of impact of both PSMA PET/CT and conventional CT on postoperative patients, I believe that PSMA PET/CT has an exceptional impact on radiotherapeutic approach.

1. <http://jnm.snmjournals.org/content/early/2018/12/13/jnumed.118.220855>
2. [bioengineeringtoday.org/diseases/how-psma-based-imaging-and-therapeutics](http://bioengineeringtoday.org/diseases/how-psma-based-imaging-and-therapeutics)

## FDA Approval of I-131-MIBG, Azedra Therapy for Pheochromocytomas and Paragangliomas

Melissa Barrios

*Salem State University, Salem, MA.*

*Department of Biology*

### Abstract

**Background:** Pheochromocytomas and paragangliomas are very rare neuroendocrine tumors that occur in patients. One way to detect these tumors is by imaging the patient using Iodine-123 MIBG or Iodine-131 MIBG. The preferred radiopharmaceutical is I-123 MIBG due to its superior imaging quality and lower radiation dosimetry. Meta-iodo-benzyl-guanidine is a norepinephrine analog that has a high affinity for binding to these types neuroendocrine tumors. When these cancers become malignant, they are very challenging to treat. A typical therapeutic treatment for neuroendocrine tumors is Lu-77-Dotatate, Lutathera. To find a specific treatment for these conditions, clinical trials were done using a higher dose of Iodine-131-MIBG, Azedra.

**Methods:** Numerous case studies and journal articles pertaining to the treatment of malignant pheochromocytomas and paragangliomas when using Azedra were reviewed. In addition, an article was used in understanding and explaining the dosimetry of Azedra to patients receiving a therapeutic dose and an imaging dose. The topic was then compared to a similar treatment using Lutathera and why Azedra is superior to Lutathera when treating neuroendocrine tumors.

**Results:** Patients are given a 3 to 6 mCi intravenous injection of Azedra and scans are acquired within the first hour and over a course of two days. This is done to assess dosimetry. The recommended therapeutic dose is 500 mCi for patients more than 62.5 kg and 8 mCi/kg for patients 62.5 kg or less. Therapeutic doses for Azedra may be altered based upon dosimetry, if necessary.

**Conclusions:** In the fall of 2018 Azedra was approved by the FDA for clinical use. With great outcomes, 98% of patients receiving two doses of Azedra presented with stable disease. I-131 MIBG is the first radiotherapy approved by the FDA for treating patients with malignant pheochromocytomas and paragangliomas.



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Does an 18-F Fluciclovine PET/CT localize the site of Prostate Specific Antigen (PSA) more accurately than other imaging modalities when detecting disease progression in patients with suspected prostate cancer recurrence?

Kathryn Beaulieu

*Lifespan School of Nuclear Medicine Technology*

## **Objective**

The purpose of this retrospective review is to suggest which imaging modality is best suitable for a patient with suspected prostate cancer recurrence. Various imaging is performed on patients with history of prostate cancer who have undergone a prostatectomy but have an elevated PSA level in their blood work. Typically, the use of imaging modalities used to try and localize the site of PSA can include a combination of CT chest-abdomen-pelvis, MRI pelvic-whole body, nuclear medicine bone scan, and PET/CT. In nuclear medicine, PET/CT utilizes an FDA approved tracer 18-F Fluciclovine. 18-F Fluciclovine is a synthetic amino acid that is transported across mammalian cell membranes by amino acid transporters. An increase of amino acid transporters such as LAT-1 and ASCT2 cause more accumulation of the tracer in cells containing PSA (1). Newer advances in diagnostic nuclear medicine imaging could be suggestive to which modality should be utilized to localize PSA in patients with suspected prostate cancer recurrence.

## **Methods**

Chart reviews were conducted at my clinical site on 49 male patients who presented for a 18-F Fluciclovine PET/CT and have a history of prostate cancer and have had a prostatectomy. The goal was to determine if PSA level at time of imaging could be suggestive of the imaging result. All 49 patients completed a PET/CT scan using 18-F Fluciclovine. A comparison between PSA level at time of imaging and imaging results could be suggestive of how useful a PET/CT scan using 18-F Fluciclovine is in detecting prostate cancer recurrence. In addition, PSA level at time of imaging was compared to other imaging exam results when applicable. 46 patients were used in this research. 3 patients were excluded due to lack of information in their medical record. 24 of the 46 patients had additional imaging. In total 88 imaging exams were correlated with the PSA level drawn closest to the date of imaging. PSA levels were separated into 3 ranges;  $\leq 0.1$  - 0.49 ng/ml, 0.5 -  $\leq 1.0$  ng/ml, and  $>1.0$  ng/ml.

## **Results**

In range 1; PSA levels  $\leq 0.1$  ng/ml - 0.49 ng/ml, 23 exams were used. Of these, 3/23 exams were CT which 1/3 (33.3%) had a positive finding with 1/1 positive biopsy to confirm. 5/23 imaging exams were a nuclear medicine bone scan which 3/5 (60%) had a positive finding with 1/1 negative biopsy. 4/23 imaging exams were MRI which 2/4 had a positive finding (50%), 0 biopsies. 11/23 imaging exams were an F-18 Fluciclovine PET/CT which 9/11 (81.8%) had a positive finding with 1/1 confirmed biopsy. In range 2; PSA levels 0.5 ng/ml -  $\leq 1.0$  ng/ml, 19 exams were used. 2/19 exams were CT which 1/2 (50%) had a positive finding with 0 biopsies. 3/19 exams were a nuclear medicine bone scan which 1/3 (33.3%) had a positive finding with 0 biopsies. 0/19 exams were MRI. 14/19 exams were an F-18 Fluciclovine PET/CT which 10/14 (71.4%) had a positive finding with 1/1 positive biopsy. In range 3, PSA levels  $> 1.0$  ng/ml, 46 imaging exams were used. 7/46 were CT which 2/7 (28.6%) were positive with 0 biopsies. 13/46 exams were a NM bone scan which 4/13 (30.8%) were positive with 0 biopsies. 3/46

exams were MRI which 3/3 (100%) had a positive finding with 0 biopsies. 23/46 exams were 18-F Fluciclovine PET/CT which 18/23 (78.3%) were positive and 1/2 had a positive biopsy.

### **Conclusion**

88 imaging exams were compared to PSA levels. 23 imaging exams were correlated with a PSA level of  $\leq 0.1$  ng/ml - 0.49 ng/ml; F-18 Fluciclovine PET/CT had the greatest percent of positive results, 9/11, 81.8%. 19 exams were correlated with a PSA level of 0.5 ng/ml -  $\leq 1.0$  ng/ml; 18-F Fluciclovine had the greatest percent of positive results, 10/14, 71.4%. 46 exams were correlated with PSA level of  $> 1.0$  ng/ml; MRI had the greatest percent of positive results, 3/3, 100%, followed by 18-F Fluciclovine PET/CT with, 18/23, 78.3%. This research suggests imaging with 18-F Fluciclovine PET/CT results in more positive exams at lower levels of PSA when being compared to other modalities. With a PSA range from  $\leq 0.1$  ng/ml – 1.0 ng/ml, 25 exams were performed with 19 positive results. 18-F Fluciclovine identified 81.8% of possible metastasis in patients with low, but rising, PSA.

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# A literature review comparing exposure rates from nuclear medicine procedures to everyday sources of radiation.

Maranda Bush

Lifespan School of Medical Imaging - Nuclear Medicine

Providence, RI

It is known that people get exposed to radiation from diagnostic nuclear medicine procedures, and it is known that people are naturally exposed to radiation in their everyday lives. It is important to understand the radiation doses given to patients in order to provide better patient education. Nuclear medicine exams are ordered with the “risk vs reward” mentality. Providing a direct comparison between radiation from these procedures and exposure from everyday life, helps shine light on the reward outweighing the risk. This abstract seeks to answer how much radiation diagnostic nuclear medicine imaging exposes patients to, compared to natural radiation exposure.

**Methods:** For this literature review, several articles pertaining to background radiation as well as radiation doses from diagnostic nuclear medicine were analyzed. Information was obtained regarding doses from common natural sources of radiation that people are likely to encounter. This information was then compared to doses from common diagnostic nuclear medicine procedures, such as a myocardial perfusion scan, a bone scan, and a lung ventilation-perfusion scan.

**Results:** The average US household gives its occupants an exposure of 228 mrem from radon gas, that decays from the earth and gets trapped in buildings. A typical myocardial perfusion imaging using Tc-99m tetrofosmin is about 1100 mrem, which is approximately the amount people get from their house every 4.8 years. Living in an area of high elevation, such as Denver, Colorado, exposes someone to nearly 3 times the amount of cosmic radiation they would receive from living at sea level. The exposure from typical tetrofosmin myocardial perfusion imaging would equal living in Denver for approximately 14 years. A transcontinental flight gives 2-3 mrem of cosmic radiation, meaning the average pilot or flight attendant receives 200-300 mrem per year. A typical bone scan using Tc-99m MDP is 630 mrem, therefore its radiation exposure amounts to working as a flight crew member for 2.1 to 3.2 years. Tobacco is another common source of radiation, exposure from the average bone scan amounts to smoking 10 cigarettes a day for 35 years. Food, especially foods high in potassium, is another way people are exposed to radiation without knowing it. A typical lung perfusion-ventilation study using Tc-99m MAA and Xenon-133, including the chest X-ray, equals 260 mrem. This study gives the same dose as would eating 2 bananas a day for 50 years, or a large order of fast food french fries a day for 55 years.



Conclusion: There are many different types of radiation, and many ways people are exposed to it in their everyday lives, sometimes unknowingly. Although radiation is dangerous at high amounts, the exposure from diagnostic nuclear medicine can be compared to seemingly harmless everyday situation. The benefits of these procedures outway the harm.

Submitted by:  
Maranda Bush

# Which form of infection imaging is best to identify prosthetic infections: $^{18}\text{F}$ FDG or radiopharmaceutical-labeled WBCs?

Robyn L. Coffield

*Lifespan School of Medical Imaging, Providence, RI*  
*Nuclear Medicine Technology Program*

Positron emission tomography (PET) has evolved into a rapidly advancing branch of nuclear medicine that goes beyond evaluating brain function and the diagnosing, staging, and monitoring of malignancies. Because PET is nonspecific, it proves successful in diagnosing inflammatory and infectious conditions (9). Radiolabeled leukocyte scintigraphy has also proven successful, although is sometimes difficult to use to differentiate infection and aseptic loosening. Research on evaluating prosthetic infection shows that both PET and radiolabeled leukocyte imaging yield success in diagnosing prosthetic infection (2). Because both have shown this ability, this literature review aims to show which has more accuracy in the diagnosis of prosthetic infection.

**Methods:** Several articles were reviewed regarding infection imaging with FDG and radiopharmaceutical-labeled WBCs. Information about the sensitivity, specificity and accuracy in detecting infection in prosthetic joints was collected and compared. Both knee and hip prosthetics were included in this retrospective analysis of 453 troublesome joints among 385 patients. The patients included in these articles were experiencing pain, leading to the evaluation of their prosthetic joint(s).

**Results:** Nine articles were reviewed; five of which used FDG, were analyzed and then the average sensitivity, specificity, and accuracy in detecting infected prosthetics was calculated. The FDG averages were higher than that of the four studies utilizing radiopharmaceutical-labeled WBCs. The accuracy of FDG in detecting infection in 303 prosthetics was an average of 0.854, while that of the 215 patients evaluated with labeled WBCs was 0.746. The sensitivity and specificity were also collectively higher when using FDG; 0.949 compared to 0.813 and 0.812 compared to 0.726, respectively. There was one study in which 89 patients with 92 hip prosthetics were imaged with both FDG and labeled WBCs. In this specific case, the labeled WBCs proved favorable over FDG for specificity, with a 2% difference, yet lacked in sensitivity (0.50) (5).

**Conclusion:** Based on the collection of articles that were reviewed in this literature analysis, imaging with FDG is superior to using radiopharmaceutical-labeled WBCs in sensitivity of detecting tracer uptake, specificity in localization of tracer, and accuracy of detecting and ultimately diagnosing infection. If not only for the statistics, imaging with FDG is likely favorable to patients due to the length of study (a few hours rather than two days for the blood labeling, reinjection, incubation and imaging). Often times, radiolabeled WBC imaging is prefaced with 3- phase, or static bone imaging (2), which can ultimately lead to greater patient dose. A downfall to imaging with FDG is that it is expensive, and getting insurance authorization may be difficult. All of the above suggests that PET imaging with FDG for evaluation of prosthetic infection may be worth the extra cost.

Submitted by:  
Robyn L. Coffield

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# Ga<sup>68</sup> PSMA and Lu<sup>177</sup> PSMA: Developing a Theranostic Approach to Prostate Cancer

Carolina Curvo

*Regis College, Weston, MA*

*Nuclear Medicine Technology*

Theranostics is defined as the use of a radioactive agent for a combination of diagnostic testing and therapy to provide a truly patient-centered plan of care. Theranostics is seen as a modern approach to the way health care providers treat diseases, most of which being various forms of cancer. However, theranostics is not as modern as it is perceived to be. In Nuclear Medicine, physicians and technologists have been providing patients with theranostic care plans for about 75 years—starting with the diagnosis and therapeutic treatment of thyroid cancer with I<sup>131</sup> sodium iodide. Recently approved by the FDA in the United States, Lu<sup>177</sup> dotatate, or Lutathera, complements imaging agent Ga<sup>68</sup> dotatate in the evaluation and treatment of malignant neuroendocrine tumors. Similarly, Ga<sup>68</sup> PSMA, a PET imaging agent used in the evaluation of prostate cancer, has been met with a therapeutic counterpart by the name of Lu<sup>177</sup> PSMA. Together, these two agents evaluate and treat castration-resistant prostate cancer, adding yet another theranostic treatment plan to Nuclear Medicine's growing repertoire.

**Methods:** Numerous journal articles were reviewed that centered on the use and application of Ga<sup>68</sup> PSMA and Lu<sup>177</sup> PSMA in theranostic treatment of castration-resistant prostate cancer. Additionally, imaging results from clinical trials performed in various countries around the world were used to assess the clinical significance of this form of treatment. The majority of the focus was on results discussed and presented in phase II clinical studies performed at the Peter MacCallum Cancer Centre in Melbourne, Australia.

**Results:** Lu<sup>177</sup> PSMA is extremely promising as an effective treatment option for men with castration-resistant prostate cancer who have exhausted all other available treatment options to no avail. After completion of Lu<sup>177</sup> PSMA therapy regimens, eight patients received PET scans using Ga<sup>68</sup> PSMA. The scans demonstrated a change in PSA levels of greater than or equal to 98 percent decline from pre-Lu<sup>177</sup> PSMA therapy levels in all eight patients treated in the phase II clinical trial.

**Conclusion:** Although theranostic treatment has existed for several decades in Nuclear Medicine practice, the rate at which new theranostic agents appear and come into clinical use has done anything but slow down. Ga<sup>68</sup> PSMA and Lu<sup>177</sup> PSMA as a theranostic approach to the treatment of castration-resistant prostate cancer yields promising results in clinical trials and actual clinical applications throughout the world.

Submitted by:  
Carolina Curvo



# Delayed Diagnosis in Breast Cancer with PET/CT imaging

Nicole Deschenes

*MCPHS University*

*Nuclear Medicine*

## Authors/Affiliations

Affiliations: Nuclear Medicine Department at Boston Medical Center, American Cancer Society, Division of Cancer Control and Population Sciences

Breast cancer is the second most common cancer worldwide. The later the diagnosis, the more progressed the cancer is. It leads to poor prognosis, a lot of treatment and tests, and a later staged cancer. Reasons for delayed diagnosis are the patient's ethnicities, language barriers, homelessness, education and especially the lack of health insurance. PET/CT is one of the best imaging modalities when it comes to breast cancer and it shows very detailed images of the patient's body, organs, and where the cancer is located. PET/CT is also used for routine scans on patients who are getting treatment for breast cancer to see if it is helping or getting worse.

**Methods:** I reviewed research articles along with a case study and it was proven that people with no health insurance are more likely to have a delayed diagnosis with breast cancer. In one of the articles it mentions that when people lack health insurance and the many more who are underinsured, do not have adequate access to health care. Studies were shown that uninsured adults were less likely to receive preventive care, seek care, or receive recommended treatment. The other article I reviewed stated that uninsured patients have a 66% higher likelihood of having late stage breast cancer. The case study I had reviewed shows a 43-year-old patient who had a breast mass for a year before seeking treatment because of the lack of health insurance and this caused her to have a stage 4 breast cancer.

**Results:** 43 y/o Jamaican pre-menopausal female presented with Stage IV breast cancer, (invasive ductal carcinoma) had a breast mass for 1 year before seeing a doctor and getting it checked out. The reason for her delayed diagnosis is because of the lack of health insurance. Her initial staging using a PET/CT scan revealed a large left breast mass with metastasis to the pleura of the chest wall, anterior mediastinum, bone, bilateral axillary lymph nodes with several lytic hyper-metabolic bone lesions within the right clavicle, sacrum, spine and pelvis consistent with metastasis, abdominal nodes. She was ER-/PR-/Her2+. ER-/PR- means her body would not respond to hormone treatment and HER2+ breast cancer is a breast cancer that tests positive for a protein called human epidermal growth factor receptor 2 (HER2), which promotes the growth of cancer cells. For the next two years she had a mastectomy of the left breast, treatment with medications such as pertuzumab, which is used to treat tumors that produce more than the normal amount of a certain substance called HER2 protein. Then later she went and had

chemotherapy. At her two year follow up the PET/CT showed no active disease and complete response. Then just under a year later another PET/CT showed recurrence in the left breast. Then after getting another PET/CT soon after, it showed she had lung metastasis (3 years post diagnosis). A PET/CT scan that was most recently done showed progression of the metastasis in the lungs (4 years from diagnosis).

**Conclusion:** When a patient has a delayed diagnosis, the patient has a higher risk of recurrence because of the stage and how severe it is and people with an early diagnosis usually have a lower risk of recurrence. And because she had no health insurance it made it even harder for her at first to see doctors and seek treatment. There are many reasons for delayed diagnosis in cancer patients, but the lack of health insurance is a major one.

Submitted by:

Nicole Deschenes

# A critical review of a case study comparing Cu-64 DOTATATE and Ga-68 DOTATOC for patients with Neuroendocrine tumors

Alexandra L. Gerardi

*MCPHS, Boston, MA*

*School of Medical Imaging and Therapeutics, Nuclear Medicine*

Neuroendocrine tumors (NETs) typically have a delay for symptoms to arise, which can cause patients to develop metastatic disease. An imaging modality was needed to aid in the early diagnosis of NETs as well as being sensitive and easily accessible. Somatostatin receptors on the surface of tumor cells are commonly presented on NETs. This is where nuclear medicine comes in with using radionuclidic somatostatic analogs which has become a strong diagnostic tool. PET tracers using Ga-68 have been used to replace the SPECT tracer, In-111 diethylenetriaminepentaacetic acid-octreotide. Cu-64 DOTATATE has been released as a new PET tracer for somatostatin receptor imaging. This case study suggests that the new PET tracer Cu-64 DOTATATE has higher sensitivity for lesions than Ga-68 based tracers. Cu-64 has a lower positron range compared to Ga-68 which in turn allows for better spatial resolution. Certain qualities of Cu-64 DOTATATE, including its over 24-hour shelf life and its 3 hour window for scanning time, make it great to use in the clinical setting.

Methods: 59 Neuroendocrine tumor patients were scanned using both Cu-64 DOTATATE and Ga-68 DOTATOC and the scans were compared. The study took place in the Departments of Clinical Endocrinology and Gastrointestinal Surgery in the Neuroendocrine Tumor Center of Excellence at Rigshospitalet, Copenhagen.

Results: Between both the Cu-64 DOTATATE and Ga-68 DOTATOC, 701 lesions were found. Cu-64 DOTATATE study showed 42 more lesions that were not detected on the Ga-68 DOTATOC scan. Ga-68 DOTATOC scan showed 26 lesions that were not detected on the Cu-64 DOTATATE, but only 7 of those lesions ended up being a true positive. During follow-up, 83 percent of the true lesions ended up being found by Cu-64 DOTATATE. Even though sensitivity is the same for both Cu-64 DOTATATE and Ga-68 DOTATOC, Cu-64 DOTATATE proved to be better at lesion detection for patients with NET.

Conclusion: Cu-64 DOTATATE surpasses Ga-68 DOTATOC in the detection of lesions in neuroendocrine tumors. More lesions were detected using Cu-64 DOTATATE than Ga-68 DOTATOC.

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# Amyloid PET imaging in Alzheimer's Disease: Comparing three imaging radiotracers

Brittany Lee Gould

*Gateway Community College, New Haven, CT  
School of Nuclear Medicine Technology*

Positron Emission Tomography (PET) imaging of Amyloid plaques have become available to assist the diagnosis of Alzheimer's disease (AD). Amyloid plaques are present in moderate to frequent numbers in the cortical gray matter in the brain of Alzheimer's disease, and develop many years before the onset of dementia. PET amyloid agents bind to amyloid neurotic plaque in cortical gray matter, scans of which provide an in vivo estimation of plaque density. Three radiotracers were used in this study:  $^{11}\text{C}$  radiotracer Pittsburgh Compound B (PiB) and two  $^{18}\text{F}$  amyloid radiotracers (florbetapir and flutemetamol).

**Methods:** Two studies were done to compare these agents. One group of 40 subjects undergone PiB and flutemetamol imaging sessions and a separate group of 32 subjects undergone PiB and florbetapir imaging sessions. We then compared cortical and white matter retention for each  $^{18}\text{F}$  tracer compared to PiB, as well as retention in several reference regions and image analysis methods. Correlations between tracer pairs were used to convert tracer-specific threshold values for amyloid positivity between tracers.

**Results:** Cortical retention for each pair of tracers was strongly correlated regardless of reference region (PiB-flutemetamol,  $\rho = 0.84-0.99$ ; PiB-florbetapir,  $\rho = 0.83-0.97$ ) and analysis method ( $\rho = 0.90-0.99$ ). Compared to PiB, flutemetamol had higher white matter retention, while florbetapir had lower cortical retention. Two previously established independent thresholds for amyloid positivity were highly consistent when values were converted between tracer pairs.

**Conclusion:** Despite differing white and grey matter retention characteristics, cortical retention for each  $^{18}\text{F}$  tracer was high compared to PiB, enabling conversion of thresholds across tracer measurement scales with a high level of internal consistency. Standardization of analysis methods and measurement scales may facilitate the comparison of amyloid PET data obtained using different tracers.

Submitted by,

Brittany Lee Gould

Interventional therapy using  $^{223}\text{Radium}$  Dichloride, to ease symptoms of castration resistant prostate cancer.

Author: Lauren Green(1)

Affiliation: School of Medical Imaging and Therapeutics; MCPHS University, Boston MA

Objectives:  $^{223}\text{Radium}$  Dichloride is a therapy used to treat castration resistant prostate cancer (mCRPC) when hormonal and surgical treatments are no longer an option.  $^{223}\text{Radium}$  Dichloride has the trade name of Xofigo which is one of few FDA approved therapy treatments for cancer metastasis. Xofigo mimics the molecule of calcium and goes to the areas of active sites of metastases. This study examines how the FDA approved  $^{223}\text{Radium}$  Dichloride. This study references two clinical trials, of the process of receiving FDA approval of  $^{223}\text{Radium}$  Dichloride and one reference text.

Methods: In order to be approved by the FDA, many clinical trials must be completed. Men with the median age of 75 received at least one treatment of  $^{223}\text{Radium}$  Dichloride. Of these men, 23% reported severe pain prior to the study beginning. Patients were injected with  $1.34\text{ }\mu\text{Ci/kg}$  of  $^{223}\text{Radium}$  Dichloride, intravenously (1). Once patient safety was secured in a blinded trial, Bayer unblinded the study to fully analyze the results of  $^{223}\text{Radium}$  Dichloride paired with chemotherapy (3).

Results: Due to the success of the clinical trials,  $^{223}\text{Radium}$  Dichloride was FDA approved in 2013.  $^{223}\text{Radium}$  Dichloride was found to lengthen life expectancy and overall quality of life for the patients who underwent the therapy.

Conclusions: There was significant improvement in the pain in the patients whom received  $^{223}\text{Radium}$  Dichloride in their treatment plan. For the patients whom completed the study, their pain was found to be reduced for the remainder of their life-span

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# An Analytical Comparison Between F-18 FDG and F-18 Florbetapir Injection for Alzheimer's Disease

Jacob Jjemba

*Regis College Nuclear Medicine Technology Program, Weston, MA*

Positron Emission Tomography (PET) imaging has been vital with the imaging and diagnosis of brain diseases like Alzheimer's. The recent approval of F-18 Florbetapir (Amyvid) by the U.S Food and Drug Administration will be important with the diagnosis of Alzheimer's disease (AD) where it binds to beta-amyloid plaques. In a healthy brain, these protein fragments are broken down and eliminated. In Alzheimer's disease, the fragments accumulate to form hard, insoluble plaques. Brain imaging is still widely done with F-18 Fluorodeoxyglucose (FDG) but with the comparison of these two radiopharmaceuticals, we notice that F-18 Florbetapir has more sensitivity and specificity.

**Methods:** Several journal articles were reviewed relating to PET brain imaging with F-18 FDG and F-18 florbetapir. Additionally, case studies were reviewed showing patients diagnosed with mild or cognitive dementia Alzheimer's disease that participated in PET scans with both stated radiopharmaceuticals.

**Results:** Nineteen patients with a clinical diagnosis of AD and 21 elderly controls were evaluated with both F-18 florbetapir and F-18 FDG PET scans. Scans were interpreted together by 2 expert readers masked to any case information and were assessed for tracer binding patterns consistent with AD. The criteria for interpreting the F-18 florbetapir scan as positive for AD was the presence of binding in the cortical regions relative to the cerebellum. F-18 FDG PET scans were interpreted as positive if they displayed the classic pattern of hypometabolism in the temporoparietal regions. The sensitivity and specificity, compared with the clinical diagnosis of AD or controls, for the F-18 florbetapir scans were 95% and 95%, respectively, and for the F-18 FDG scans 89% and 86%, respectively.

**Conclusion:** Essentially, the scans from both radiopharmaceuticals performed well in detecting AD in patients with known clinical AD. This shows that they are both valuable in the diagnosis of AD from the despite F-18 FDG being more widely utilized. F-18 florbetapir could be the next preferred imaging agent due to its superiority over F-18 FDG in terms of sensitivity and specificity.

Submitted by:

Jacob Jjemba

# A comparison of diagnostic quality between a computed tomography coronary angiography and a nuclear medicine myocardium perfusion imaging.

Kiana G. Koke

*Regis College, Weston, MA*  
*Nuclear Medicine Program*

As technology advances and medical equipment adapts to different patient conditions, there becomes a greater question as to which examinations would be most beneficial. Both, computed tomography coronary angiography (coronary CTA) and nuclear medicine myocardium perfusion imaging (MPI), display similar results while having unlike routes in accomplishing these medical conclusions. Simple factors can gravitate a patient towards one exam more than the other. However, when dealing with the general population the question then becomes which procedure would provide the most proper care for the patient. In addition, with improvements continuing in technology it is thought that one modality will take over the other's workload indefinitely for this particular diagnosis.

**Methods:** Several journal and peer-reviewed articles were analyzed containing information about CT coronary angiography and nuclear medicine cardiac stress testing, as well as articles comparing the two procedures. In addition to this, multiple case studies were reviewed of patients who received both a CT coronary angiography and a nuclear medicine stress test. Lastly, first-hand information was gathered from sources within Mass. General Hospital.

**Results:** A basic result was dependent on the indication and specific information looking to gain from these cardiac studies will decide the necessary protocol. Coronary CTA's are less timing consuming, have a higher sensitivity, and can rule out more than one condition with a single exam. However, limitations are present when patients are allergic to IV contrast, have server calcification within the coronary arteries, and the procedure itself does not have the ability to show the functionality of the coronary arteries. MPI's main feature is showing function, as well as being more adaptable to patients and their conditions. Although these benefits come at the drawbacks of timing and the availability of attenuation correction. Other than these major separating factors, the procedures have similarities that have both advantages and disadvantages for diagnostic findings.

**Conclusion:** Through comparative analysis, Coronary CTA's and MPI studies have relatively equal diagnostic value. One exam can not truly trump the other because of the diverse population and their varies conditions. Ultimately, the decision is made based on the patient's needs with the next component being the ordering provider or radiologists personal preference.

# Prostate-specific membrane antigen (PSMA) PET/CT imaging and therapeutic protocol

Lyndsey Maffa

MCPHS University  
Nuclear Medicine Technology

Prostate-specific membrane antigen (PSMA) is a non-invasive, diagnostic study, using  $^{68}\text{Ga}$ .

Used with PET/CT, the study looks for signs of prostate cancer, along with metastasis (if any).

PSMA uses a molecule called monoclonal antibody, which binds to prostate specific membrane antigens on cancer cells. From the study, diagnosis and staging can be determined, along with treatment planning, and ongoing care. PSMA can also be used as a therapy agent, using  $^{177}\text{Lu}$ -PSMA.

**Methods:** PSMA has quickly become popular across the globe. Several articles, journals, and case studies have been reviewed with the accomplishment of the study for prostate cancer.

**Results:** PSMA imaging uses 1.8-2.2 MBq/kg  $^{68}\text{Ga}$ -PSMA-111 (67.63 minute half life). The radiopharmaceutical is injected intravenously, and flushed with saline (bolus). The patient must be well hydrated for the scan. The patient is instructed to drink at least 500mL of water, 2 hours prior to imaging, voiding immediately before. 20 mg of furosemide may be used, but is not required in patient preparation. Uptake time is recommended at 60 minutes, in some cases up to 100 minutes. If the image shows findings after 1 hour, the patient can be imaged 3 hours' post injection to help with identifying lesions. The patient is positioned supine, with their arms over their head. PET acquisitions typically range from 2 to 4 minutes per bed position, from mid-thigh to the base of the skull.

**Conclusion:** Overall, PSMA has impacted the diagnosis of prostate cancer in a great way, as well as catching the disease early. With the fast growth of the PSMA imaging and therapy, patients with prostate cancer may experience a greater survival rate. PSMA has, and will become a large, important aspect in nuclear medicine, overtime.

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# **TITLE: Struma Ovarii: An Incidental Finding in Nuclear Medicine Imaging**

Jessica C. Morrison  
*Salem State University, Salem, MA*  
*Department of Biology*

**OBJECTIVES:** Struma Ovarii is a type of monodermal teratoma located in the ovaries comprised of over 50% thyroid tissue. It can be benign or malignant and is almost always incidentally found. Majority of cases are asymptomatic or present with symptoms mimicking other pathologies.

**METHODS:** Several articles were reviewed pertaining to Struma Ovarii. Specifically outlined is a rare case including the patient's individual diagnosis and treatment.

**RESULTS:** The patient presented with clinical symptoms of hyperthyroidism along with persistent abdominal pain for one year. After full work up, including labs and imaging in multiple modalities including Iodine-131 whole body scan, a diagnosis of Struma Ovarii was determined. Abdominal exploration was performed followed by total abdominal hysterectomy with bilateral salphingoophorectomy.

**CONCLUSION:** Due to its rarity, there has been debate about its diagnosis and treatment. There is no standard diagnosis and treatment. It has been suggested to use the same guidelines as those for thyroid carcinoma when determining the diagnosis and treatment plan for a patient.

*Keywords:* Struma Ovarii, Iodine-131, hyperthyroidism

## Works Cited

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## Abstract

Comparing 89-Zirconium-Transferrin with 18-Fluorine-FDG PET images of triple negative breast cancer and brain tumors

Jennifer Nugent

Salem State University - Nuclear Medicine

Salem, MA

**Objectives:** Transferrin receptors play a significant role in the process of MYC upregulation, which encourages the production and growth of cancer cells. Research has shown a correlation between the amount of transferrin uptake in cancer cells and how quickly the cells proliferate. PET imaging with 89Zr-Transferrin allows for the determination of oncogene status more efficiently than 18F-FDG can.

**Methods:** Case studies comparing 18F-FDG and Zr-89 transferrin PET imaging of TNBC and brain tumors were reviewed. Quantitative biodistribution studies were performed on mice that received patient-derived xenografts. Tumor-to-background ratios of 18F-FDG and 89Zr-transferrin were compared.

**Results:** 89Zr-transferrin demonstrated significantly better tumor-to-background ratios than 18F-FDG in TNBC and brain tumors. 89Zr-transferrin, with a physical half life of 3.27 days, has shown potential for becoming an ideal radiopharmaceutical for imaging TNBC and brain tumors due to its high sensitivity and specificity for these clinically challenging cancers.

**Conclusion:** Compared to 18F-FDG, 89Zr-transferrin has shown improved image quality in TNBC and brain tumor xenograft-bearing mice. The reviewed research suggests that 89Zr-transferrin is a more ideal radiopharmaceutical for imaging these tumors.

# Impact of PET/CT imaging with Axumin 18F-Fluciclovine on clinical management options for men with biochemical recurrence (BCR) of prostate cancer.

Gabriella G. Paiva

*Gateway Community College, New Haven, CT  
School of Nuclear Medicine Technology*

Axumin Fuciclovine F18 injection is indicated for positron emission tomography (PET) imaging in men with suspected prostate cancer recurrence, based on elevated blood prostate specific antigen (PSA) levels following prior treatment. Preparation includes to avoid any type of exercise for at least 24 hours prior and to not drink/eat for at least 4 hours prior.

**Methods:** 81 patients underwent PET/CT imaging with suspected prostate cancer recurrence based on elevated prostate specific antigen (PSA) levels following prior treatment. All patients received 10 mCi Axumin (18F-fluciclovine) intravenous. Images were taken immediately post injection from pelvis to top of the skull. Images sets were then reviewed for diagnostic quality by physicians experienced in clinical PET/CT with correlating of standard-of-care imaging which could include; CT and/or MRI of pelvis and bone scan imaging.

**Results:** More than 67 of the 81 patients had positive Axumin (18F-fluciclovine) scans. A total of 18 patients then showed osseous bone lesions. 21 of the 67 patients showed lymph node involvement. 40 patients had standard of care imaging; 15 had MRI of prostate, 2 patients had a CT of their pelvis, and 23 had bone scan imaging. 41 patients had no other imaging studies. The results prompted Axumin (18F-fluciclovine) PET/CT imaging to be added to the standard-of care diagnostic work-up. As a result, patients had their clinical management changed.

**Conclusions:** Based on this study, PET/CT scanning with Axumin was found to be beneficial for the localization of recurrent prostate disease. This study also found that PET/CT scanning with Axumin was beneficial for changing the clinical management for men with biochemical recurrence (BCR) of prostate cancer.

Submitted by:  
Gabriella G. Paiva

## DOES RESIDUAL ACTIVITY RESIDE IN THE PAN AFTER PREPARATION FOR A GASTRIC EMPYTING STUDY?

*Jacob J. Parent*

*Rhode Island Hospital, Providence, R.I.*

*Lifespan School of Medical Imaging*

**Background:** In nuclear medicine a gastric emptying study is used to detect gastroparesis or delayed gastric emptying. One method to this study involves the technologist preparing a standardized meal for the patient that consists of 2 egg whites tagged with Tc-99m Sulfur Colloid, 2 pieces of toast with jam, and a cup of water. At some facilities, the sulfur colloid comes in 2 mCi doses, however actual dosage requirement is 1 mCi. Tc-99m sulfur colloid has an energy level of 140 Kev, and a physical half-life of 6 hours. The most common method of preparing the eggs is to put them into a frying pan, and then inject the sulfur colloid into the eggs once on the pan. Considering the fact that the sulfur colloid is injected into the pan, once the eggs are removed there must be some residual activity in the pan. It is important to know how much activity is remaining in the pan because this can lead to contamination. If there is a large amount of contamination in the pan, then it may not be appropriate to use the same pan multiple times a day. In this case, proper storage of the pan must be put into practice until the activity decays.

**Method:** The Tc-99m sulfur colloid will be injected during a gastric emptying study into the eggs once they are inside the pan. Once the eggs are removed from the pan, a Geiger Muller counter will be used to measure the residual activity in the pan. Patient dose, and a reading will be recorded based on the Geiger Muller's measurements. The data will be used to determine contamination within the pan. In order to maintain a constant reading, the Geiger Muller counter will record each measurement 20.3 cm away from the pan for each trial.

**Results:** The data recorded included each reading of the contamination within the pan from the 10 trials. Each reading from 10 trials was combined and calculated to get an average reading of contamination within the pan. The average dose was 1.0 mCi, and the average contamination was 0.2 mR/hr.

**Conclusion:** The contamination in the pan will affect not only the technologist, but also the patients following the previous one. Alternatives to prevent further exposure must be taken including washing the pan after each use and injecting the Tc-99m sulfur colloid into the eggs before entering the pan.

# Administration method for new FDA approved drug Lutathera (Lutetium-177 Dotatate) for patient with gastroenteropancreatic neuroendocrine tumors.

Dipti Patel  
MCPHS University, Boston MA  
School of Medical Imaging & Therapeutics

**Objectives:** Lutathera, known as Lutetium-177 dotatate, is a prescription medicine used to treat adults with a type of cancer known as gastroenteropancreatic neuroendocrine tumors (GEP-NETs) that are positive for the hormone receptor somatostatin, including GEP-NETs in the foregut, midgut, and hindgut.

**Methods:** I have searched 10 Journals from Society of Nuclear medicine and molecular imaging, 2 articles from NCBI and 5 articles from National cancer institute regarding Lutathera's protocol and treatment. I have selected 2 Journals from SNMMI and 2 articles from National Cancer Institute and 1 article from NCBI.

**Results:** A diagnostic Position Emission Tomography scan will be done for patients to locate the tumor before treatment with Lutathera. Imaging with dotatate is done to determine if it is likely to be taken up by the tumor and help destroys it. The physician will determine the course of treatment for the patient that best suits their needs. The patient will have an intravenous liquid infusion of Lutathera and an amino acid that protects the patient's kidneys from radiation. The amino acid infusion begins first, followed by Lutetium-177 Dotatate shortly after. The Lutetium-177 Dotatate infusion takes about 45 minutes and the amino acid infusion takes 4 to 6 hours. The patient will have the Lutetium-177 Dotatate infusion sessions one every two months. Patients will also receive an injection of long-acting octreotide which they will get for up to 18 months. Patients who were treated with Lutetium-177 Dotatate lived substantially longer without their cancer progressing

**Conclusion:** Lutetium-177 Dotatate is for patients in generally good health with no liver or kidney dysfunction who have pancreatic or small bowel tumors that are recurring, inoperable or have not responded to treatment. Treatment with Lutetium-177 Dotatate is new promising tool for patient with GEP-NETs and it is very effective.

Submitted by,  
Dipti Patel

A review of the characteristics and function of Lutetium <sup>177</sup> PSMA radioligand therapy (PSMA-617).

Elizabeth Reep

*MCPHS University, Boston MA  
School of Medical Imaging & Therapeutics  
Nuclear Medicine Technology*

The prostate specific membrane antigen (PSMA) is a protein that is expressed in low levels normally on prostate tissue but in high amounts on most forms of prostate cancer tissue, making them the perfect target for specific, beta-emitting therapy. Using Lutetium <sup>177</sup> PSMA radioligand therapy to target these antigens spares the surrounding healthy tissue in the prostate and other nearby structures. This therapy has yielded promising results with low toxicity to patients with metastatic castration-resistant prostate cancer.

**Methods:** The characteristics of PSMA and its interaction with Lutetium <sup>177</sup> were studied using nuclear medicine journals to summarize its purpose and function as a radioligand therapy. The journals chosen to study were the most current available, considering this drug is in its trial phase and new information is being updated currently<sup>3</sup>. These articles were found from the Society of Nuclear Medicine and Molecular Imaging, the National Center for Biotechnology Information database, the Journal of Medical Radiation Sciences, and the journal of Molecular Imaging.

**Results:** PSMA is a transmembrane protein which lies primarily on the surface of prostate cancer cells in great amounts. The amount of expression of this protein correlates with how aggressive the prostate cancer is, and therefore can be used as a prognosis tool. Because of its location at the surface of the cell, PSMA is an accessible target for the transmission of the radioactive atom Lutetium <sup>177</sup>. Being a radioligand therapy, a high affinity ligand is used to connect the Lutetium <sup>177</sup> to the PSMA protein channel<sup>1</sup>. The ligand- Lutetium <sup>177</sup> pair, a drug called PSMA-617, releases beta energy into the cancer cell to irradiate and hopefully destroy it. Its energy only travels 1 mm, so side effects and unnecessary radiation to other tissue is minimized<sup>3</sup>.

**Conclusion:** Because of the specific nature of the interaction between PSMA-617 and the cancer cell's PSMA, the toxicity is reduced by directly targeting the cell and emitting beta energy. In a recent study, PSMA levels on prostate cancer cells were reduced by 70% with 54% having a decline of more than 50% when PSMA-617 was introduced earlier into treatment<sup>2</sup>. In addition, the majority of patients in another trial only demonstrated low grade renal toxicity<sup>3</sup>. With this being said, there is not a lot of information so far on the long term toxicity<sup>3</sup>.

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# A Phase 3 case study trial of <sup>177</sup>Lu-Dotatate for midgut neuroendocrine tumors.

Alejandra Rios

*Gateway Community College, New haven CT  
Nuclear Medicine Program*

Patients with advanced midgut neuroendocrine tumors who have had disease progression during first-line somatostatin analogue therapy have limited therapeutic options. This randomized, controlled trial evaluated the efficacy and safety of lutetium-177 (<sup>177</sup>Lu)–Dotatate in patients with advanced, progressive, somatostatin-receptor–positive midgut neuroendocrine tumors.

**Methods:** 229 patients who had well-differentiated, metastatic midgut neuroendocrine tumors to receive either <sup>177</sup>Lu-Dotatate at a dose of 7.4 GBq every 8 weeks. The primary end point was progression-free survival. Secondary end points included the objective response rate, overall survival, safety, and the side-effect profile. The final analysis of overall survival will be conducted in the future as specified in the protocol; a prespecified interim analysis of overall survival was conducted and is reported here.

**Results:** the estimated rate of progression-free survival at month 20 was 65.2% in the <sup>177</sup>Lu-Dotatate group and 10.8% in the control group. The response rate was 18% in the <sup>177</sup>Lu-Dotatate group versus 3% in the control group. 14 deaths occurred in the <sup>177</sup>Lu-Dotatate group and 26 in the control group

**Conclusion:** Treatment with <sup>177</sup>Lu-Dotatate resulted in markedly longer progression-free survival and a significantly higher response rate than high-dose octreotide LAR among patients with advanced midgut neuroendocrine tumors.

Submitted by:  
Alejandra Rios

Updated 1/31/2019



# A literature review of the survival of patients with midgut neuroendocrine tumors that were treated with Lutetium 177-Lu-Dotatate (Lutathera)

Savannah Swain

*MCPHS University  
Nuclear Medicine Technology*

**Introduction:** Recently the Food and Drug Administration (FDA) has approved the use of 177-Lu-Dotatate (Lutathera) for the treatment of inoperable neuroendocrine tumors (NET's) that affect the pancreas or midgut. Patients with NET's have limited options if the tumors do not positively react to other therapy. Lutathera consists of Lu-177 that is attached to Dotatate. Dotatate binds to NET cells that have a molecule known as somatostatin receptor on the surface. It is because of this receptor that the dotatate is able to enter the tumor cells and emit radiation from Lu-177 to kill the cells<sup>2</sup>

**Methods:** The FDA approval of Lutathera was supported by two clinical studies. In the first study 116 patients with inoperable, somatostatin receptor-positive NET's in the midgut that had previously gotten worse after treatment with Sandostatin, were given 7.4 GBq 177Lu-Dotatate every 8 weeks via IV. The other 113 patients were given 60 mg of octreotide LAR alone via IM every 4 weeks (control group), for a total of 229 patients<sup>4</sup>

The other study that supported the FDA approval of Lutathera was done in the Netherlands on 1214 patients. Of the 1214 patients 360 of them had GEP-NETs. The patients were administered "4 doses of 200 mCi of 177Lu-Oxodotreotide via IV, at 6-13 week intervals. The control group consisted of 53 patients"<sup>3</sup>

**Results:** The first study showed that the progression-free survival at month 20 was 65.2% in the 177-Lu-Dotatate group and 10.8% in the control group. 18% response rate in the 177-Lu-Dotatate group and 3% in the control group. 14 deaths occurred in the 177-Lu-Dotatate group and 26 in the control group.<sup>3</sup>

The second study found that complete or partial tumor shrinkage was reported in 16% of the 360 patients with GEP-NETs who were evaluated for response by the FDA<sup>1</sup>

**Conclusion:** Overall it has been shown that Lutathera has had a positive effect on somatostatin receptor positive NET's. It has been shown that Lutathera has a higher response rate than octreotide LAR and the survival rate for patients treated with Lutathera is higher. Another study goes hand in hand with the use of Lutathera; The use of PET and gallium-68 tagged to dotatate is used to determine if the patients tumors are somatostatin receptor positive, this scan is needed to determine if Lutathera is likely to work. In the future, studies should be done to determine the toxicity of Lutathera.

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MEETING DESCRIPTION

The Annual Scientific Meeting of the Greater New York and New England Chapters of the SNMMI is a continuing education course designed for nuclear medicine physicians, radiologists, technologists, and scientists. Nationally recognized faculty will provide attendees with information that will enhance clinical practice. This year's program will review nuclear medicine applications to such fields as cardiology, neurology, oncology, and therapy. Advances in topics such as PET, PET/CT, SPECT/CT, PET/MR, neuromolecular imaging, Digital PET, Pediatrics, GI Bleeding, Theranostics and molecular targeting and therapy will also be included.

CALL FOR ABSTRACTS

The Greater New York/New England Chapters of the Society of Nuclear Medicine and Molecular Imaging are pleased to announce new poster awards honoring the memory of our colleague Dr. Hussein Abdel Dayem, to be awarded to the top three posters judged to have the highest scientific merit during our upcoming meeting in Stamford, CT, November 8-10, 2019. Poster Awards: 1st place: \$1,000 | 2nd place: \$750 | 3rd place: \$500

We encourage all Physicians, Scientists, and Technologists to submit their scientific abstracts and case reports to either Rachel Powsner, MD (Rachel.Powsner@va.gov) of the New England Chapter or Jeffrey Kempf, MD (jeffrey.kempf@univrad.com) of the Greater New York Chapter by October 25, 2019.

All accepted abstracts will be published in Clinical Nuclear Medicine. Abstracts should be submitted as Microsoft Word documents, with a maximum word count of 500 words, and be divided into headings of Background, Methods, Results, and Conclusion. Embedded black and white images, graphs and/or tables are acceptable. *The winners of the abstracts judged by a panel of experts to be of the highest scientific merit will be announced at the conclusion of the poster presentation session at noon on Saturday, November 9. Please note: All accepted presentations will be in poster format (4' vertical x 8' horizontal boards).*



FRIDAY, NOVEMBER 8, 2019

7:00 am REGISTRATION  
Grand Ballroom  
Mezzanine Foyer

7:55 WELCOME ADDRESS  
Josephine Rini, MD  
Janusz K. Kikut, MD

SESSION 1: NEUROLOGY AND SNMMI UPDATE  
Moderator: Don Yoo, MD

8:00 Role of Molecular Imaging in Neurodegenerative Diseases  
Gagandeep Choudhary, MD

8:45 SNMMI Update 2019  
Alan B. Packard, PhD

9:30 COFFEE BREAK & VISIT THE EXHIBITS

SESSION 2: THYROID CANCER IMAGING  
Moderator: Tony Abraham, DO

10:00 Thyroid Cancer: Surgeon's Perspective  
Kepal Patel, MD

10:45 The Swinging Pendulum of Thyroid Cancer Management: Where are we now?  
Noah A Bloomgarden, MD

11:15 Differentiated Thyroid Cancer: Updated classification, ATA Guidelines Overview and Role of Radioiodine  
Ravinder K Grewal, MD

12:15 pm COMPLIMENTARY LUNCHEON/ NON-CME PRESENTATION

SESSION 3: PROSTATE IMAGING & THERANOSTICS SAM  
Moderator: Jeffrey Kempf, MD

1:30 Prostate Imaging: PSMA PET  
Liza Lindenberg, MD

2:15 Prostate Theranostics  
Liza Lindenberg, MD

3:00 REFRESHMENT BREAK & VISIT THE EXHIBITS

SESSION 4: THERANOSTICS & NUCLEAR MEDICINE JEOPARDY SAM  
Moderator: Marc Seltzer, MD

3:45 The Use of Cu 64/67 in Theranostics  
Alan B. Packard, PhD

4:30 Nuclear Medicine Jeopardy  
Don C. Yoo, MD  
Marc A. Seltzer, MD

5:30 COMPLIMENTARY RECEPTION Exhibit Hall

SATURDAY, NOVEMBER 9, 2019

7:00 am COMPLIMENTARY BREAKFAST/ NON-CME PRESENTATION

SESSION 5: CARDIAC PET IMAGING SAM  
Moderator: Jeffrey Kempf, MD

8:00 Cardiac Amyloid: PYP and Amyloid PET  
Sharmila Dorbala, MD

8:45 FDG PET for Cardiac Infection and Inflammation  
Venkatesh Murthy, MD

9:30 COFFEE BREAK & VISIT THE EXHIBITS

SESSION 6: UPDATES IN PEDIATRICS  
Moderator: Mark Seltzer, MD

10:15 The Use of PET/CT in Pediatric Patients  
Stephan D Voss, MD

11:00 The Use of PET/MR in Pediatric Patients  
Stephan D Voss, MD

11:45 POSTER PRESENTATIONS  
Rachel Powsner, MD  
Jeffrey Kempf, MD

12:15 pm COMPLIMENTARY LUNCHEON/ NON-CME PRESENTATION

SESSION 7: HOWARD KAY MEMORIAL LECTURE AND LUTATHERA THERAPY  
Moderator: Antonio Obando, MD

1:30 HOWARD KAY MEMORIAL LECTURE FDG PET and Response Assessment of Immunotherapy  
Rathan Subramaniam, MD, PhD

2:15 Update on Lutathera Therapy  
Rathan Subramaniam, MD, PhD

3:00 REFRESHMENT BREAK

SESSION 8: HOLMAN KAPLAN AWARD QUALITY AND INTERESTING CASE REVIEW SAM  
Moderator: Don C. Yoo, MD

3:15 HOLMAN-KAPLAN AWARD Pediatric Genitourinary Imaging: Urinary Tract Infection, Vesico-ureteral Reflux and Hydronephrosis  
Ruth Lim, MD

4:00 Achieving Quality in Nuclear Medicine  
April Mann, MBA, CNMT, NCT, RT(N), FSNMMI-TS

4:30 Interesting/Challenging Cases  
Jeffrey Kempf, MD

SUNDAY, NOVEMBER 10, 2019

7:30 am COMPLIMENTARY CONTINENTAL BREAKFAST

SESSION 9: PET IMAGING  
Moderator: Munir Ghesani, MD

8:00 PET/CT and PET/MR for Infection  
Munir Ghesani, MD

8:45 Nuclear Cardiology for the Evaluation of Arrhythmic Risk  
Mark Travin, MD

9:30 REFRESHMENT BREAK

SESSION 10: CARDIAC SPECT & PET SAM  
Moderator: Munir Ghesani, MD

10:00 PET Hardware and Software Review  
Edward Ficaro, PhD

11:00 SPECT Hardware and Software Review  
Edward Ficaro, PhD



33<sup>rd</sup> ANNUAL  
NORTHEAST  
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SCIENTIFIC MEETING



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SOCIETY OF  
NUCLEAR MEDICINE  
AND MOLECULAR IMAGING

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MEETING REGISTRATION FORM

Please Type or Print Clearly

Name: \_\_\_\_\_  
Last First Degree/Certification (MD, PhD, CNMT, RT)

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone ( ) \_\_\_\_\_ e-mail \_\_\_\_\_

SNMMI Member Number \_\_\_\_\_

Check Appropriate Box:	Registration Fee	
Check Appropriate Box:	Friday-Sunday Fee	Saturday-Sunday Fee
Physician/Scientist, SNMMI Member	\$350.00 <input type="checkbox"/>	\$275.00 <input type="checkbox"/>
Physician/Scientist, Non-Member	\$450.00 <input type="checkbox"/>	\$375.00 <input type="checkbox"/>
Resident or Fellow	\$185.00 <input type="checkbox"/>	\$140.00 <input type="checkbox"/>
Technologist, SNMMI Member	\$185.00 <input type="checkbox"/>	\$140.00 <input type="checkbox"/>
Technologist, Non-Member	\$325.00 <input type="checkbox"/>	\$250.00 <input type="checkbox"/>
Technologist Student	No Fee <input type="checkbox"/>	No Fee <input type="checkbox"/>

All fees include handouts, refreshment breaks, lunch on Friday and Saturday, breakfast on Saturday and continental breakfast on Sunday.

☐ If you have a disability, which requires special accommodations, please check here and advise us of your needs at least two weeks in advance of the program.

Please make check payable to:  
GNYSNMMI  
and mail to:  
Mitchell H. Stromer  
Northeast Regional Meeting, SNMMI  
78 Halley Drive  
Blue Point, NY 11772  
Email: mitch360@aol.com

You can also register and pay online utilizing a credit card at  
www.greaternycsnmmi.org

GENERAL INFORMATION

DATES: November 8 - 10, 2019  
LOCATION: Hilton Stamford Hotel & Executive Meeting Center  
1 First Stamford Place, Stamford, CT 06902  
TEL: 203-967-2222  
REGISTRATION: Grand Ballroom Mezzanine Foyer, Friday, November 8, 2019, 7:00 A.M..

A block of rooms has been reserved at the Stamford Hilton Hotel, ideally located just off the I-95 corridor. The Hotel offers first class hospitality and services with its unique mixture of New York energy and New England charm. It is located within minutes of fabulous dining and upscale Stamford shopping. Facilities include an updated fitness center as well as a heated indoor pool. Easy access from Philadelphia, New York and Boston is steps away when arriving at the Stamford Metro North Station via Amtrak.

Hotel room reservations can be made by calling Hilton Reservations at 1-800-445-8667 and identifying yourself as an attendee at the Society of Nuclear Medicine and Molecular Imaging meeting. You can also make online reservations by going to website www.greaternycsnmmi.org. click on Upcoming Events, then Northeast Regional Meeting, then Hotel Reservations, enter dates of stay, click More Options, click on Add Special Rate Codes, enter code NMMI next to group code.

The Hotel will hold reduced room rates until October 16. The rate for a single or double room is \$119/night. The rate for a deluxe King with a Jacuzzi is \$139/night. The rate for an Executive Suite is \$199/night. All rates are subject to a 15% tax.

TARGET AUDIENCE

This meeting is intended for all nuclear medicine physicians, scientists, physicists, technologists, and nursing professionals.

EDUCATIONAL OBJECTIVES

1. Discuss new applications and techniques in molecular brain imaging.
2. Discuss important advocacy and priority issues currently being addressed by the SNMMI within the field.
3. Discuss the current surgical options used in the treatment of thyroid cancer.
4. Discuss current options used for patient management of thyroid cancer.
5. Discuss the updated guidelines and use of radioactive iodine in the treatment of thyroid cancer.
6. Discuss the clinical applications of PET in the diagnosis and treatment of prostate cancer.
7. Discuss the applications of Cu 64/67 in theranostics.
8. Identify sources of artifacts, errors and incidental finding that may arise during various nuclear medicine procedures.
9. Discuss PET and SPECT techniques in the diagnosis of cardiac amyloidosis.
10. Discuss the use of PET in the detection of cardiac infections and sources of inflammation.
11. Discuss the clinical applications of PET/MRI and PET/CT in the pediatric patient population.
12. Discuss the use of FDG PET for the response assessment of immunotherapy.
13. Discuss the updated applications and procedures for Lutathera therapy.
14. Discuss the clinical applications and techniques used for pediatric genitourinary imaging.
15. Discuss the importance of achieving quality in nuclear medicine imaging.
16. Review interesting and challenging cases in nuclear medicine imaging.
17. Discuss the use of PET/MRI and PET/CT in the diagnosis and treatment of infectious disease processes.
18. Discuss updates to hardware and software used for PET and SPECT imaging.

NUCLEAR MEDICINE TECHNOLOGISTS: VOICE CATEGORY A CREDITS

The SNMMI, through its Verification of Involvement in Continuing Education (VOICE) program, has approved this meeting to offer continuing education hours (CEHs), final hour count TBD closer to the meeting. VOICE-approved credit is recognized by most licensure states and by the NMTCB and ARRT as Category A credit. Participants will receive CE credit for those sessions at which they were present a minimum of 80% of the session.

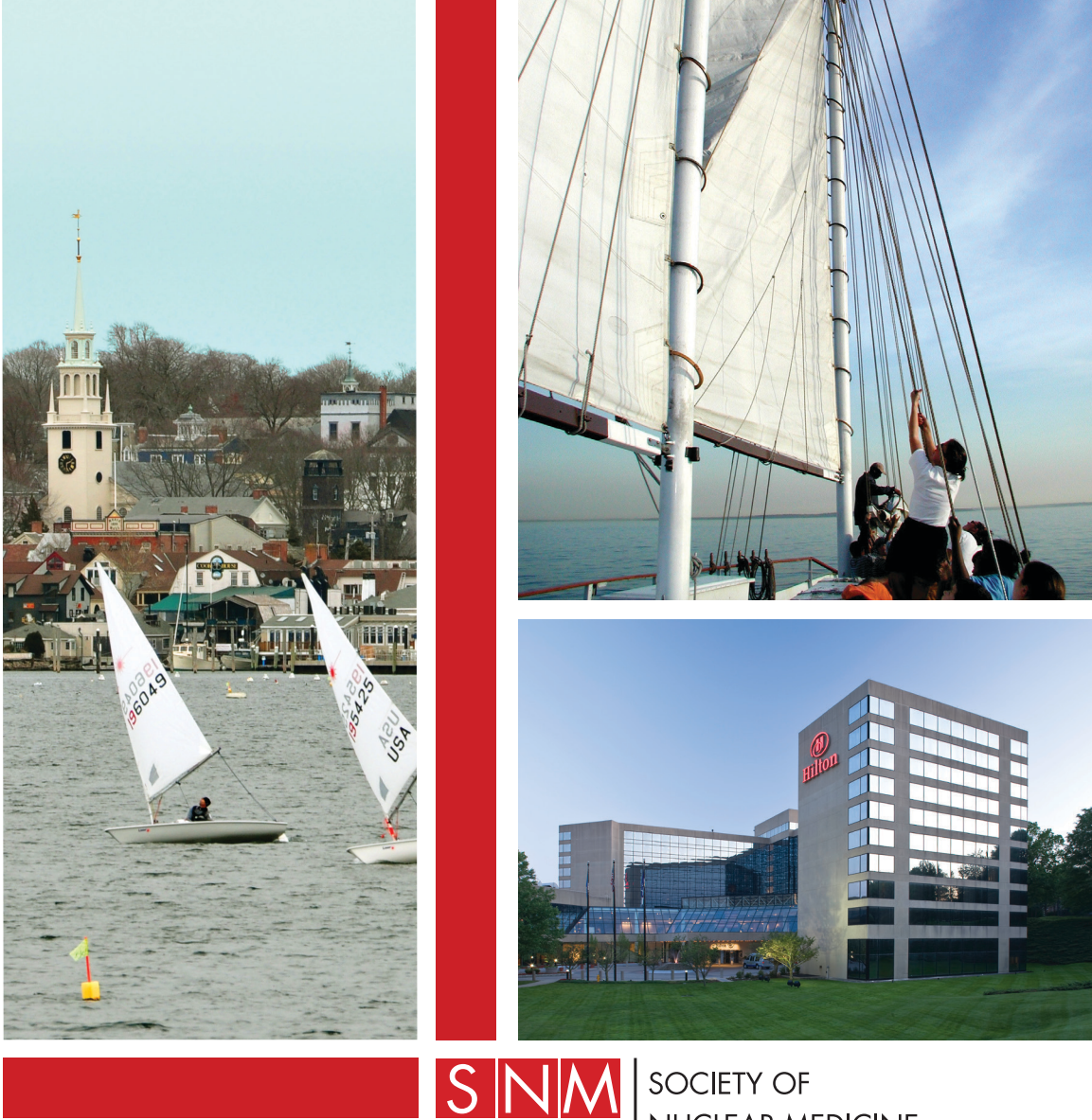
PHYSICIAN: CONTINUING MEDICAL EDUCATION

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the Society of Nuclear Medicine and Molecular Imaging, Inc. (SNMMI) and the New England and Greater New York Chapters, SNMMI. The SNMMI is accredited by the ACCME to provide continuing medical education for physicians.

SELF-ASSESSMENT MODULE (SAM) CREDITS

SAM

In addition to CME credits, physician attendees will have the opportunity to earn SAM credits. Physicians must attend the entire session to earn SAM credits and complete the post-activity online assessment.



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