A Message from the President

Twyla B Bartel, DO, MBA, FACNM

Your Correlative Imaging Council (CIC) has been very active for the last few months, and we would like for you to participate if interested. One way to find out what all we are doing is to attend one of the CIC sessions at the June 2019 SNMMI Annual Meeting where we will be having a short business meeting and celebration at the end of a longer session that introduces our inaugural Barry Siegel Lectureship and Award. We will give you a brief summary at this business meeting on our activities, see where you might be interested in becoming involved, and celebrate with "bites" - cupcakes and cold drinks. The entire session is on Sunday, 6-23-19, from 12:30 PM to 2 PM. Additional sessions we are involved with are listed elsewhere in this newsletter.

Another exciting item to mention is our first-ever CME/SAM opportunity in this newsletter for members. You can read it below. Thanks so much to Dr. Thomas Hope for writing this up.

We would like to thank our outgoing intern, Christopher Owens, for his participation with the CIC. We have recently created a stronger mentorship group for our CIC interns. Our new intern for 2019 through 2021 is Dr. Andrew Kozlov. Dr. Lesley Flynt will be his mentor with Drs. Simin Dadparvar and Gholam Reza Berenji as sub-mentors. So, please keep a look out for the exciting projects they will be creating and bringing to the CIC.

The CIC has also just approved and solicited for international board members. We will have one new additional international board member beginning this year and solicitation for a second next year.

Again, other items we have been busy working on include the popular PET/CT workshops (in collaboration with the cardiovascular council, pediatric council, and PET COE), overseeing the CT workshops at the annual meeting, outreach projects, and various other items.

I hope to meet several of you at the annual meeting, and please remember to come to as many of our sessions as you can, in particular, the session on Sunday 6-23-19 as mentioned above.
New!! 2019 Inaugural CIC Barry Siegel Lectureship and Award

The Correlative Imaging Council is delighted to establish the annual Barry A. Siegel Lectureship and Award in 2019. Barry A. Siegel, M.D., FSNMMI, is currently Professor of Radiology and Medicine at Washington University School of Medicine and a member of the University’s Alvin J. Siteman Cancer Center. Dr. Siegel has been at Washington University since 1962, when he matriculated as an undergraduate. He subsequently attended medical school followed by a medical internship and radiology and nuclear medicine residencies at Washington University. He served as Director of the Division of Nuclear Medicine of the Mallinckrodt Institute of Radiology from 1973 to 2017.

Throughout his career, Dr. Siegel has been active in nuclear medicine research and has made contributions related to the diagnosis of pulmonary embolism, the detection of thrombosis, and oncological applications of radionuclide tracers. For the last two decades, his research efforts have focused on uses of positron emission tomography for cancer diagnosis and staging as well as predicting and monitoring tumor response to therapy. He also has been heavily engaged in the development and conduct of multicenter clinical trials in the arena of cancer imaging with PET via leadership roles in both the American College of Surgeons Oncology Group and the American College of Radiology Imaging Network (now the ECOG-ACRIN Cancer Research Group). From 2005 to 2018, he devoted much of his time to the development and operation of the National Oncologic PET Registry (NOPR), and those efforts have helped to greatly expand coverage for PET by the Medicare program. Most recently, he is also serving as co-chair of the Imaging Dementia—Evidence for Amyloid Scanning (IDEAS) Study, a national study designed to demonstrate the clinical value of brain amyloid PET in patients with mild cognitive impairment or dementia.

A prolific writer and editor, with over 400 journal articles, book chapters, and books to his credit, Dr. Siegel is also actively involved as an editorial board member for several journals and served from 1988 to 2002 as the Editor In Chief of the Professional Self-Evaluation Program (the "Syllabus Series") published by the American College of Radiology.

Dr. Siegel is active in government affairs, having served as a consultant and advisory committee chair for the Food and Drug Administration. He is also a past chairman of the Nuclear Regulatory Commission’s Advisory Committee on the Medical Use of Isotopes. His contributions have been recognized by several professional societies with the Georg Charles de Hevesy Nuclear Pioneer Award for outstanding contributions to nuclear medicine from the Society of Nuclear Medicine in 2003; the Peter Valk Distinguished Clinical Scientist Award from the Academy of Molecular Imaging in 2008; the Benedict Cassen Prize from the Education and Research Foundation for Nuclear Medicine and Molecular Imaging in 2014; and the National Award of Nuclear Science & History from the National Atomic Museum Foundation in 2016.

Dr. Siegel is a respected clinician at Washington University Medical Center and has been selected by the Mallinckrodt Institute’s radiology residents as an outstanding teacher. The Washington University Medical Center Alumni Association named a Distinguished Alumni Scholarship in his honor in 1997 and gave him an Alumni Faculty Award in 2004. Most recently, the medical school honored him with its Distinguished Clinician Award in 2013, and Barnes-Jewish Hospital gave him its Lifetime Achievement Award in 2015.
**New!! CME for CIC Members: PET/MRI in Prostate Cancer**

Thomas A. Hope, MD; University of California, San Francisco

After reading this article, click [https://www.snmmilearningcenter.org/SNMMI/6789363/Details](https://www.snmmilearningcenter.org/SNMMI/6789363/Details) to answer the questions for 0.5 CME/SAM.

**VOICE credit**: [https://www.snmmilearningcenter.org/Activity/6808324/Detail.aspx](https://www.snmmilearningcenter.org/Activity/6808324/Detail.aspx)

Objectives:
1. To review the role of PET imaging in detection of metastatic disease in initial staging and at time of biochemical recurrence in prostate cancer patients.
2. To provide examples of pathologic findings with 18F-fluciclovine and 68Ga-PSMA-11 PET in staging prostate cancer patients.
3. To demonstrate the benefit of simultaneous imaging using PET/MRI for the characterization of lesions.

The development of numerous radiotracers imaging prostate cancer has led to excitement about staging prostate cancer, primarily based on the data with using probes targeting the prostate specific membrane antigen (PSMA). The first Phase 3 trial evaluating a 68Ga-PSMA-11 was recently published reaffirming the high detection sensitivity and specificity of PSMA targeted agents in the setting of biochemical recurrence (1). Although the majority of the literature, particularly retrospective literature out of Europe and Australia, is focused on 68Ga-PSMA-11, it is likely that all PSMA targeted imaging agents will have similar high detection sensitivities compared to amino acid based radiotracers such as 11C-choline and 18F-fluciclovine. Although the focus is often on PSMA imaging, it should be remembered that 18F-fluciclovine is the agent that is currently approved for the imaging of biochemically recurrent prostate cancer (Parent:2018ex).

The combination of PET and MRI has a large potential in the setting prostate cancer, both in the characterization of primary cancer and the detection of metastatic disease. In the setting of primary disease, MRI is currently the primary tool for lesion characterization leveraging Prostate Imaging Reporting and Data System (PI-RADS) (2). PI-RADS characterizes the chance of clinically significant prostate cancer, primarily using diffusion weighted imaging (DWI) for lesions in the peripheral zone of the prostate (Figure 1).

The highest score, PI-RADS 5, is given to tumors with restricted diffusion that are either greater than 1.5 cm or are extending beyond the prostate. A number of groups have looked at the added value of 18F-fluciclovine or 68Ga-PSMA-11 for the characterization of primary tumors (3-5). Although it does appear that molecular imaging does increase the sensitivity and specificity for the detection of clinically significant tumor compared to MRI alone, it is not clear what the role of molecular imaging will be given that the role of MRI is primarily to guide the urologist as to where to biopsy (6). The main role of targeted PET in primary staging is likely in the detection of nodal metastases prior to definitive therapy.

In the setting of biochemical recurrence, where a patient’s prostate specific antigen (PSA) is rising after definitive therapy such as radiation therapy or prostatectomy, PET/MRI may have a greater role than originally expected. After prostatectomy biochemical recurrence is defined as a PSA that is greater than 0.2 ng/dL at least six weeks after surgery, and after radiation therapy is defined as a PSA rise of greater than 2.0 ng/dL over the post-treatment nadir. Seeing anatomic correlatives to uptake seen on targeted imaging can improve lesion characterization and reader confidence, which may not as clear on CT imaging alone. With 18F-fluciclovine, uptake in the bone is not well understand and observing correlated enhancing lesions on MRI can be very helpful in interpretation (Figure 2). One other limitation of 18F-fluciclovine is the characterization of disease in the prostate bed (Schuster:2014bl). Uptake in the prostate bed with 18F-fluciclovine has a low specificity, and MRI can be helpful in characterizing local recurrence after prostatectomy and radiation therapy. In particular dynamic
contrast enhanced (DCE) imaging can help find anatomic correlates for subtle uptake seen on PET imaging in the prostate bed (7) (Figure 3).

Overall PET/MRI has significant potential in prostate cancer, and with the current wide availability of 18F-fluciclovine PET for imaging patients with biochemical recurrence, PET/MRI is currently directly translatable to imaging patients. With 18F-fluciclovine PET, MRI can be particularly helpful for the characterization of osseous metastases as well as local recurrence. The potential will continue to grow with the pending approves of PSMA targeted agents in the coming years.

**Figure 1:** 68Ga-PSMA-11 PET/MRI in a patient at initial staging demonstrating a focal lesion in the left peripheral zone, which demonstrates uptake on the 68Ga-PSMA-11 PET, which corresponds to restricted diffusion seen on the high-b-value and apparent diffusion weighted image (DWI). These findings are consistent with a PI-RADS 4 lesion based on the DWI findings.
Figure 2: 18F-fluciclovine PET/MRI in a patient imaged after radical prostatectomy with a right inferior pubic ramus metastases. The 18F-fluciclovine PET demonstrates uptake greater than adjacent marrow. MRI demonstrates a lesion seen on pre-contrast T1, which enhances after the administration of gadolinium consistent with osseous metastatic disease.

Figure 3: 68Ga-PSMA-11 PET/MRI in patient with local recurrence after radiation therapy. Focal uptake in the prostate gland. Neither T2 weighted imaging or post-gadolinium imaging demonstrates no anatomic abnormality. Only on dynamic contrast enhanced (DCE) imaging or perfusion shows an early enhancing nodule that correlates with the focal uptake seen on the 68Ga-PSMA-11 PET.

References
CIC Sessions at the 2019 Annual Meeting in Anaheim (some as collaborations)

1. **Title:** CAT03: Molecular Imaging of Autoimmunity and Immune Checkpoint Inhibition Efficacy (CMIIT Categorical Session)
   **Organizers:** Delphine Chen (CMIIT), David Dick (RPSC), Katherine Zukotynski (PET CoE), Twyla Bartel (CIC)
   **Time/Date:** 7:30 AM - 3:00 PM, Sat, Jun 22, 2019

2. **Title:** CE12: Cardiac PET/CT Workshop (CIC CE Session)
   **Organizers:** Twyla B Bartel (CIC), Sharmila Dorbala (CVC), Katherine Zukotynski (PET COE)
   **Time/Date:** 3:15 PM - 4:45 PM, Sat, Jun 22, 2019

3. **Title:** CE08: Prostate Cancer Nuts and Bolts: Diagnosis and Therapy (Therapy COE CE Session)
   **Organizers:** Daniel Lee (Therapy CoE), Rathan M Subramaniam (CIC)
   **Time/Date:** 3:15 PM - 4:45 PM, Sat, Jun 22, 2019

4. **Title:** CE19: Barry A Siegel MD Lectureship and Award: Title: CE19: Barry A Siegel MD Annual Lectureship & Award (CIC CE Session)
   **Organizers:** Twyla B Bartel, Rathan M Subramaniam
   **Time/Date:** 12:30 PM - 2 PM, Sun, Jun 23, 2019

5. **Title:** CIC Walter Wolf Young Investigator Awardee Scientific Presentation
   **Time/Date:** 2:00 PM – 3:00 PM, Sun, Jun 23, 2019

6. **Title:** CE60: Neuroendocrine Tumor Diagnosis and Therapy (CIC CE Session)
   **Organizers:** Daniel Lee (Therapy CoE), Rathan M Subramaniam (CIC)
   **Time/Date:** 4:45 PM - 6:15 PM, Mon, Jun 24, 2019

7. **Title:** CIC Walter Wolf Young Investigator Award Ceremony
   **Time/Date:** 12:30 PM – 2:00 PM, Tues, Jun 25, 2019

8. **Title:** CE64, CE71, CE78, CE85: Annual CT Review Course (CIC CE Sessions)
   **Organizers:** Patrick Colletti, Gholam Reza Berenji
   **Time/Date:** 8:00 AM – 3:00 PM, Tues, Jun 25, 2019

Meet Our New CIC Intern (2019-2021)

Andrew Kozlov is originally from St. Petersburg, Florida. He attended college at Northwestern University and medical school at the University of Florida. He is currently finishing a combined radiology and nuclear radiology program at the Hospital of the University of Pennsylvania in Philadelphia. In July 2019, he will be a fellow in breast imaging at Stanford University. He is interested in breast imaging and procedures, nuclear and molecular imaging of metastatic breast cancer, and medical education. Dr. Lesley Flynt will be his primary mentor.
**Get To Know Your CIC Board Members**

**Patrick M Colletti, MD, FACNM, FSNMMI**

CIC Board Position: Past President

Primary Areas of Interest Related to Nuclear Medicine: Molecular Imaging and Therapy

Organization/Title: Keck School of Medicine of USC, Professor of Radiology

Two Primary Contributions to Our Field: Editor-in-Chief of *Clinical Nuclear Medicine*; Past President of ACNM

Hobbies/Outside Interest: Karate

Comments Regarding CIC: The CIC develops and presents educational content linking nuclear medicine and molecular imaging with other medical imaging methods.

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**Simin Dadparvar, MD, FACNM, FACP**

CIC Board Position: Board Member

Primary Areas of Interest Related to Nuclear Medicine: Theragnostics, PET/CT, SPECT/CT, Neuroimaging

Organization/Title: Temple University, Philadelphia, PA; Professor of Radiology

Two Primary Contributions to Our Field: Organized CT training for several hundred nuclear medicine physicians and technologist; Held several leadership positions including President of CIC

Hobbies/Outside Interest: Poetry, Music, Exercise

Comments Regarding CIC: Correlative Imaging is a very important council which familiarizes and educates nuclear medicine physicians, scientists, and technologists with new imaging and non-imaging modalities.

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**John T Doan, MD**

CIC Board Position: Board Member

Primary Areas of Interest Related to Nuclear Medicine: Theragnostics, PET/CT, SPECT/CT, Neuroimaging

Organization/Title: Oklahoma and Texas; Radiologist/Nuclear Medicine Physician

Two Primary Contributions to Our Field: CIC Board of Directors; Southwestern Chapter SNMMI Board Trustee

Hobbies/Outside Interest: Tennis, Outdoor Activities

Comments Regarding CIC: As medical management becomes more integrated, medical imaging plays a central role in the multidisciplinary approach toward patient care. The application of correlative imaging from nuclear medicine and molecular imaging along with different imaging modalities in radiology serves an important role in the diagnosis and management of patient's health care.