2021 SNMMI Highlights Lecture: Oncology and Therapy, Part 1

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From the Newsline Editor: The Highlights Lecture, presented at the closing session of each SNMMI Annual Meeting, was originated and presented for more than 30 years by Henry N. Wagner, Jr., MD. Beginning in 2010, the duties of summarizing selected significant presentations at the meeting were divided annually among 4 distinguished nuclear and molecular medicine subject matter experts. Each year Newsline publishes these lectures and selected images. The 2021 Highlights Lectures were delivered on June 15 as part of the SNMMI Virtual Annual Meeting. In this issue we feature the first part of the lecture by Heiko Schöder, MD, MBA, chief of the Molecular Imaging and Therapy Service at Memorial Sloan Kettering Cancer Center (New York, NY) and a professor of radiology at the Weill Medical College of Cornell University (New York, NY), who spoke on oncology and therapy highlights from the meeting. The second part of the lecture will appear in the November issue of Newsline. Note that in the following presentation summary, numerals in brackets represent abstract numbers as published in The Journal of Nuclear Medicine *(2021;62[suppl 1]).*

First I would like to thank the organizers for inviting me to give this year's highlights lecture on oncology and therapy. It is a pleasure to present these findings. We will begin with a brief statistical characterization of the oncology-related abstracts presented at the 2021 SNMMI Annual Meeting. The majority (51%) came from North America, with a second large percentage of contributions from Asia (41%), and others from Europe (6%), Africa (1%), and South America (1%). Among international countries contributing, a large number of abstracts came from China (166), followed by Korea (61), Japan (57), India (34), Canada (34), and Australia (20). As in past years, the majority (80%) of these abstracts focused on diagnostics, with only about 20% on therapeutic applications.

Among the highest rated abstracts in the clinical area, many were focused on fibroblast activation protein inhibitor (FAPI) and prostate-specific membrane antigen (PSMA) imaging in one form or another, and these will be discussed in detail in this lecture. In the area of basic research, no clear topic emerged as dominant. A number of new probes were presented at the meeting, and we will look at several of these. In the area of therapy, the large majority of abstracts focused on prostate cancer and neuroendocrine tumors.

Clinical Diagnostics

FAPI

Many of us remember the 2019 SNMMI Image of the Year (Fig. 1) from multiple researchers at the University Hospital Heidelberg (Germany), which showed FAPI uptake across a wide range of malignancies (*1*). In the intervening 2 years, numerous case reports and small clinical studies have shown the utility of FAPI-based imaging in diagnosis, staging, radiation therapy planning, and changes in patient management across a range of malignant diseases and sites, including (among others) the lung, pancreas, lower gastrointestinal tract, and head and neck and in sarcoma and peritoneal carcinomatosis. Results from these and other studies, however, have also shown that FAPI is not a cancer-specific agent. Uptake has been shown in a range of inflammatory conditions, including thyroiditis, benign pancreatic lesions, pulmonary fibrosis, solitary fibrous tumor, and others, as well as in the postmyocardial infarction setting.

Heiko Schöder, MD

As background, the tumor microenvironment includes blood vessels, extracellular matrix, and a number of different types of cells, including cancer-associated fibroblasts (CAFs). CAFs are relevant in cancer progression, resistance to therapy, and also in regulating the immune environment. They can be targeted by a number of therapies. FAP is a transmembrane glycoprotein and prognostic marker in cancer expressed only on activated fibroblasts, including activated CAFs. FAP can be targeted in a variety of ways, including by FAPIs, which we use for imaging. As noted, a number of smaller studies have been published, and the field is ready to move on to larger and more quantitative analyses to study the role of FAPI in selected malignancies.

Kessler et al. from the University of Duisberg-Essen, the German Cancer Consortium (DKTK, Essen; DKFZ, Heidelberg), and University Hospital Essen (all in Germany) reported on "^{68}Ga-FAPI for sarcoma imaging: Data from the FAPI-PET prospective observational trial" [126]. The study included 47 patients with bone and soft tissue sarcoma who underwent clinical ^{68}LGa-FAPI PET imaging, 46 of whom also underwent ^{18}F-FDG PET. The study's primary endpoint was association of ^{68}Ga-FAPI PET uptake intensity and histopathologic FAP expression. Secondary endpoints were detection rate, positive predictive value (PPV), interrater reproducibility, and change in management. The ^{68}Ga-FAPI tracer showed high sensitivity and PPV on a per patient and per region basis. In a comparison of detected rates, ^{68}Ga-FAPI PET results were similar to those with ^{18}F-FDG PET, although in some instances ^{18}F-FDG provided additional

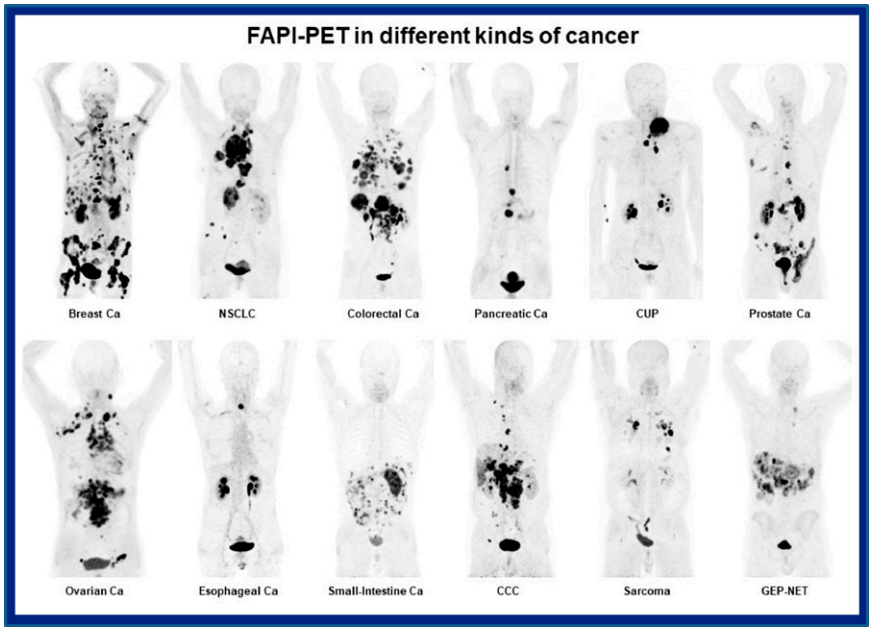

FIGURE 1. SNMMI 2019 Image of the Year: ^{68}Ga-FAPI PET/CT in patients reflecting 12 different tumor entities. Ca = cancer; NSCLC = non–small cell lung cancer; CUP = carcinoma of unknown primary; CCC = cholangiocarcinoma; GEP-NET = gastroenteropancreatic neuroendocrine tumor. Image was created with contributions from Clemens Kratochwil, Paul Flechsig, Thomas Lindner, Labidi Abderrahim, Annette Altmann, Walter Mier, Sebastian Adeberg, Hendrik Rathke, Manuel Rohrich, Hauke Winter, Peter Plinkert, Frederik Marme, Matthias Lang, Hans Ulrich Kauczor, Dirk Jaeger, Juergen Debus, Uwe Haberkorn, and Frederik L. Giesel, each of whom was affiliated with University Hospital Heidelberg (Germany).

information. It is possible that in the future, at least in some patients, complete workups may require both radiotracers. The authors found that the ^{68}Ga-FAPI tracer uptake correlated with immunohistochemistry (IHC)-assessed FAP expression in sarcoma: the higher the FAP expression on IHC, the higher the SUV. Figure 2 is an example from 2 patients, 1 with negative IHC FAP and no uptake on imaging, 1 with positive IHC FAP and high uptake on imaging.

Mona et al. from the University of California Los Angeles/University of California Los Angeles Medical Center reported on "Validation of FAPi PET biodistribution by immunohistochemistry in patients with solid cancers: A prospective exploratory imaging study" [1000]. This study included 15 patients and a variety of tumors and looked at similar correlations, using tissue microarrays to explore whether ^{68}Ga-FAPi-46 PET image biodistribution accurately reflects FAP expression from resected tumor and nontumor specimens. Figure 3 is an interesting patient example, showing strong uptake in a pancreatic tail ductal adenocarcinoma with the corresponding IHC stain. FAP IHC in representative histologic sections demonstrated variable negative-to-weak FAP expression in normal pancreatic parenchyma, except for a subpopulation of cells in normal islets consistently showing strong FAP expression. Again, we see a direct relationship between IHC in tissue and SUV on FAPI PET. The researchers concluded that this and associated translational validation "pave the way for large-scale prospective trials on the use of ^{68}Ga-FAPi-46 PET/CT as a biomarker and stratification tool for FAP-targeted therapies."

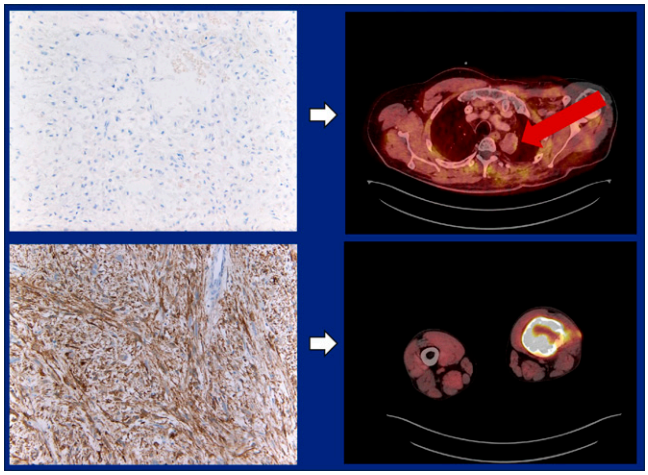

FIGURE 2. ^{68}Ga-FAPI for sarcoma imaging. Data from the FAPI-PET prospective observational trial [126]. Immunochemistry (IHC)-assessed FAP expression in sarcoma correlated well with ^{68}Ga-FAPI tracer uptake. Top: IHC (left) and FAPI PET/CT (right) images in a patient with FAP– disease. Bottom: corresponding images in a patient with FAP+ disease.

Other abstracts on FAPI imaging were presented at this meeting, and time does not allow me to detail each of these, but several have already been published in major journals. Chen et al. from First Affiliated Hospital of Xiamen University/Xiamen University (China) reported on the "Role of ^{68}Ga-FAPI PET/CT in the evaluation of peritoneal carcinomatosis and comparison with ^{18}F-FDG PET/CT" [20] (*2*). This is a challenging indication in PET and PET/CT imaging. The retrospective study included 46 patients (16 with diffuse-type peritoneal carcinomatosis, 27 with nodular-type peritoneal carcinomatosis, and 3 true-negative patients). The researchers presented encouraging data indicating that FAPI uptake was higher than that of ^{18}F-FDG, that FAPI PET allowed detection of smaller lesions, and that a particular

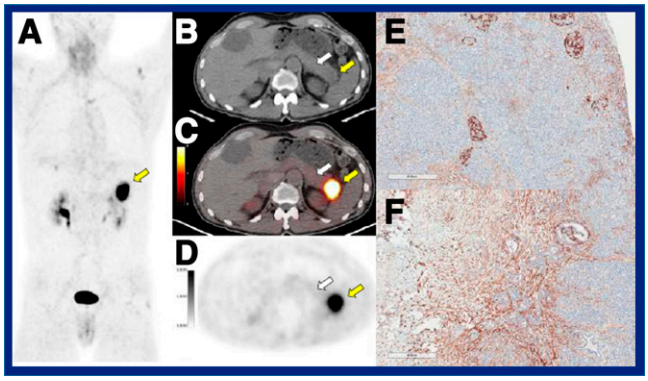

FIGURE 3. Validation of FAPi PET biodistribution by immunohistochemistry (IHC) in patients with solid cancers. Example: 65-year-old man with pancreatic ductal adenocarcinoma (yellow arrows: pancreatic tail ductal adenocarcinoma lesion; white arrows: resected normal pancreas region). (A) Whole-body PET; (B) transaxial CT; (C) transaxial PET/CT (SUV_{max} 15.69); (D) transaxial PET (SUV_{mean} 12.51). (E) FAP IHC on representative histologic sections demonstrated variable negative-to-weak FAP expression in normal pancreatic parenchyma with a subpopulation of cells in normal islets consistently showing strong FAP expression; and (F) moderate-to-strong FAP expression was noted for tumor tissue.

advantage for FAPI PET was evident in gastric and colon cancers.

Pang et al. from Xiamen University/First Affiliated Hospital of Xiamen (China) reported on "Comparison of ^{68}Ga-FAPI and ^{18}F-FDG uptake in gastric, duodenal, and colorectal cancers" [125] (*3*). They reported that ^{68}Ga-FAPI PET/CT was superior to ^{18}F-FDG PET/CT in detection of primary and metastatic lesions, with higher tracer uptake in most primary and metastatic lesions.

Other related abstracts looked at nasopharyngeal cancer, where FAPI imaging provided additional advantages in evaluating skull base invasion, suggesting that FAPI PET/MR may become routine in future evaluations in this setting. Qin et al. from Union Hospital, Tongji Medical College, and Huazhong University of Science and Technology (Wuhan, China) reported on "A head-to-head comparison of ^{68}Ga-DOTA-FAPI-04 and ^{18}F-FDG PET/MR in patients with nasopharyngeal carcinoma: A prospective study" [124] (*4*). They found that ^{68}Ga-FAPI outperformed ^{18}F-FDG in delineating primary tumors and detecting distant metastases, particularly in the evaluation of skull-base and intracranial invasion, concluding that "^{68}Ga-FAPI hybrid PET/MR has the potential to serve as a single-step staging modality" for patients with nasopharyngeal cancer. Zhao et al. from the First Affiliated Hospital of Xiamen University (China) reported on the "Clinical utility of ^{68}Ga-FAPI PET/CT for primary staging and recurrence detection in nasopharyngeal carcinoma" [1086] (*5*) in a study with 45 participants. Their data also indicated higher uptake of ^{68}Ga-FAPI than ^{18}F-FDG.

Prostate Cancer

Prostate cancer remains a significant burden across the globe, including the Americas, large portions of Africa and Europe, and Australia. On May 12, a new Lancet Commission was announced to study prostate cancer in greater detail, to create recommendations for prostate cancer diagnosis and treatment, and to address disparities in prostate cancer management. The announcement noted that "genomic tools and imaging, particularly PSMA PET-CT, are likely to be increasingly important in treatment decisions in the future" (*6*).

Two large and influential recent studies have focused on prostate cancer, 1 on ^{68}Ga-PSMA-11 and the other on ^{18}F-DCFPyL. Fendler from the University of California at Los Angeles and an international consortium of research centers reported in *JAMA Oncology* on an "Assessment of ^{68}Ga-PSMA-11 PET accuracy in localizing recurrent prostate cancer: A prospective single-arm clinical trial" (*7*). The study included 635 men with biochemically recurrent prostate cancer after treatment and identified high PPV, high detection rate, and high interreader agreement for localization with ^{68}Ga-PSMA-11 PET. Morris et al. from Memorial Sloan Kettering Cancer Center (New York, NY) and an international consortium of research centers reported in *Clinical Cancer Research* on "Diagnostic performance of ^{18}F-DCFPyL-PET/CT in men with biochemically recurrent prostate cancer: Results from the CONDOR phase III, multicenter study" (*8*). The study included 208 men with rising prostate-specific antigen (PSA) ≥0.2 ng/mL after prostatectomy or ≥2 ng/mL above nadir after radiotherapy. Of note, patients were included in the ^{68}Ga-PSMA-11 study irrespective of prior imaging findings, whereas in the ^{18}F-DCFPyL study, the median PSA was lower and only patients with negative or equivocal prior imaging were enrolled. Nevertheless, we can identify common themes in their findings: higher overall detection rates (75% for ^{68}Ga-PSMA-11; 59%–66% with ^{18}F-DCFPyL) correlated with increasing PSA levels and very respectable numbers in terms of PPV and sensitivity (sensitivity here referring to cases with histologic verification). Reader agreement results were also good with both tracers.

Rowe from Johns Hopkins Medicine (Baltimore, MD) and the CONDOR consortium provided additional data from their study at this meeting in "A phase 3 study of ^{18}F-DCFPyL PET/CT in patients with biochemically recurrent prostate cancer (CONDOR): An analysis of disease detection rate and PPV by anatomic region" [123]. They found that ^{18}F-DCFPyL PET/CT detected and localized metastatic lesions with high PPV regardless of anatomic region (prostate/prostate bed, pelvic lymph nodes, or extrapelvic regions, including lymph nodes, bone, and viscera/soft tissue) (Fig. 4). Higher PPVs were observed in extrapelvic lymph nodes and bone compared to viscera/soft tissue. This is, of course, important, because an imaging agent may not be very useful if it addresses disease only in the pelvis but not outside (or vice versa). I should point out that the number of visceral lesions in this study was quite small, so related data probably should not be overinterpreted.

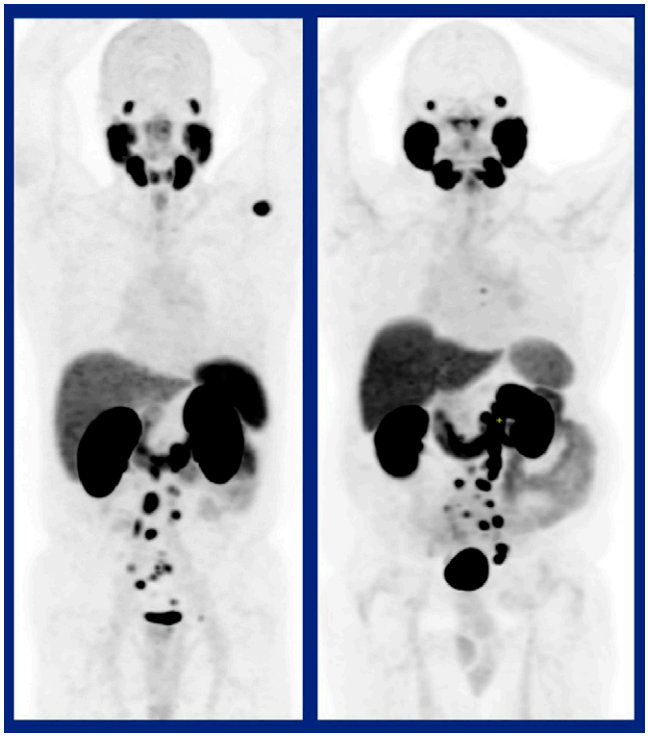

FIGURE 4. Left: Representative imaging from the ^{68}Ga-PSMA-11 PET/CT trial from UCLA and an international consortium. Right: Representative imaging from the CONDOR phase III ^{18}F-DCFPyL PET/CT trial. Despite difference in enrollment criteria and procedures, common findings included higher overall detection rates that correlated with increasing prostate-specific antigen levels, good positive-predictive values, and improved sensitivity. Reader agreement results were also high with both tracers.

Other abstracts were presented on these and other PSMA compounds. Although I cannot detail each one, I want to highlight 4 as illustrative of current research and findings. Lin et al. from the University of California at San Francisco reported on "The increased prevalence of low and heterogeneous PSMA uptake in the setting of metastatic castration-resistant prostate cancer" [1349]. In this retrospective study, low PSMA uptake (≥1 lesion with no-to-low PSMA uptake) was seen on >50% of scans, and heterogeneous uptake (defined as both low and high PSMA uptake lesions on the same scan) was seen on >40% of scans. The authors concluded that this high degree of heterogeneity within patients and in low PSMA-expressing tumors may complicate treatment, particularly with PSMA-targeted radioligand therapy.

Maliha et al. from McGill University Health Center, the University of Montreal, and the Jewish General Hospital (all in Montreal, Canada) reported on "Physiological DCFPyL PSMA-targeted tracer uptake in the epididymis head newly appreciated on digital PET/CT" [1321]. This was an interesting incidental finding, and the authors noted that it is both common and more frequent in patients with higher serum testosterone levels. They emphasized that this physiologic finding should not be misinterpreted as pathologic.

Lindenberg et al. from the National Cancer Institute (NCI), the University of California San Francisco, Johns Hopkins University School of Medicine (Baltimore, MD), Yale University (New Haven, CT), and Novartis Pharmaceuticals (East Hanover, NJ; Turin, Italy; and Geneva, Switzerland) reported on "Safety and tolerability of ^{68}Ga-PSMA-R2 as an imaging agent in patients with biochemical recurrence or metastatic prostate cancer" [1319]. In this safety and tolerability study, the PSMA agent was well tolerated with no significant adverse events. The authors concluded that the lesion detectability and low radiation dose absorbed by salivary and lacrimal glands compared with other PSMA PET agents are promising for future therapeutic applications.

Miksch et al. from University Hospital Ulm, the Technical University Munich (Garching), and the German Armed Forces Hospital Ulm (all in Germany) reported that "Novel ^{18}F-siPSMA-14 shows favorable kinetics and high interobserver agreement in staging of prostate cancer patients" [1328]. The study analyzed biodistribution, detection rates, and interobserver agreement in 134 patients with either primary prostate cancer or recurrent disease. On a 5-point grading system, good agreement was noted (94% in primary and 86% in recurrent disease). As in previous abstracts, higher detection rates were found with higher PSA levels. No forced diuresis was used in the study. Target-to-nontarget ratios were notably high in PET/CT-positive tumors (9.3 in prostate, 11.6 in lymphatic, 14.3 in bone, and 14.6 in visceral lesions), enabling excellent contrast imaging. This contrast is evident in Figure 5 in a patient assessed for primary disease after chemotherapy. On the left, excreted activity in

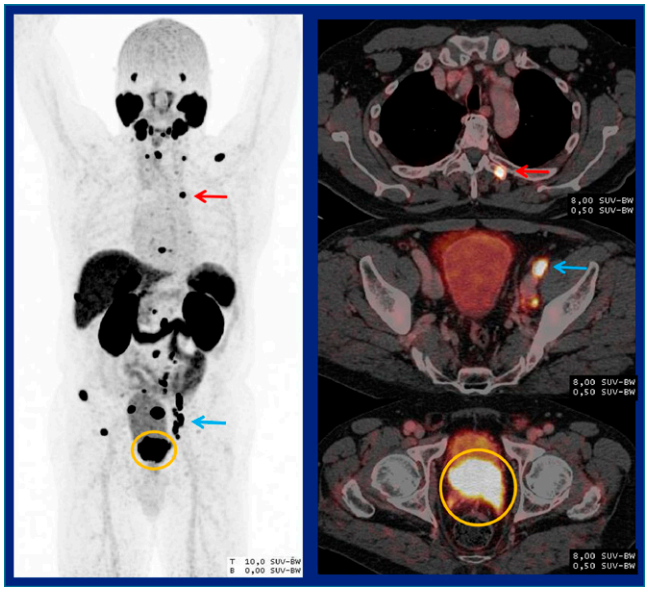

FIGURE 5. ^{18}F-siPSMA-14 in staging prostate cancer patients. Images acquired in a 64-year-old man with progressive disease after chemotherapy (prostate-specific antigen = 100 ng/mL). Left: excreted activity on PET in the urinary bladder obscures the primary tumor. Right: contrast is high on ^{18}F-siPSMA-14 PET/CT for bone (top), lymph node metastases (middle), and (although some excreted activity is seen in the bladder) much higher uptake is apparent in the primary tumor (bottom).

the urinary bladder obscures the primary tumor; on the right, contrast is high for bone and lymph node metastases and, although some excreted activity is seen in the bladder, much higher uptake is apparent in the tumor. This tracer is especially promising, then, for detecting locoregional recurrence.

Other Applications

Naghavi-Behzad et al. from the University of Southern Demark (Odense), Odense University Hospital (Odense, Denmark), the Basel Academy for Quality and Research in Medicine (Switzerland), and the Technical University of Munich (Germany) reported on "Response monitoring in metastatic breast cancer: A comparison of survival times between FDG PET/CT and contrast-enhanced CT" [129]. This study is relevant to a challenge with which many of us deal on a day-to-day basis in our practices: arguing with insurance companies about whether a scan should be preapproved for reimbursement. Patients in the study underwent conventional imaging with contrast-enhanced CT (144 patients), FDG PET/CT (83 patients), or both (72 patients) as part of response monitoring to treatment. Their results indicated that overall, 5-year survival rates for patients with metastatic breast cancer were significantly higher with PET/CT alone (41.9%) or in combination with contrast-enhanced-CT (43.3%) than with contrast-enhanced CT alone (15.8%). Why would patients with PET imaging have better survival? The answer, of course, is that the improved survival is not related to the modality per se but to the fact that PET enables earlier detection of recurrence and more timely and appropriate management decisions. This study is clear evidence of the utility of PET/CT in response assessment in patients with breast cancer and provides the kind of quantitative data that may prove persuasive to third-party payers.

Clinical Therapies

Great advances are being reported in clinical therapies in our field, highlighted this year by 2 recent clinical trials in patients with advanced prostate cancer. Results from the VISION trial were reviewed on June 6 at the American Society of Clinical Oncology (ASCO) meeting by Michael Morris, MD, from Memorial Sloan Kettering Cancer Center (New York, NY). The study has primary endpoints comparing radiographic progression-free survival and overall survival in patients with progressive PSMA-positive metastatic castrate-resistant prostate cancer who receive ^{177}Lu-PSMA-617 in addition to best supportive/best standard of care versus patients treated with best supportive/best standard of care alone. The study enrolled patients who had positive PSMA signals on PET imaging and who had previously received taxane therapy and novel androgen axis therapy and were now deemed eligible only for best supportive care. It is important to point out that no PSMA-only arm was included in the study. Both the ASCO presentation and recently published results show that the treatment arm in the VISION trial had better overall survival and better radiographic progression-free survival with improved quality of life. We look forward to more analyses and results from this trial.

The next trial was the TheraP trial, which had some important differences from the VISION trial. Hofman et al. from the Peter MacCallum Cancer Centre/University of Melbourne, St. Vincent's Hospital and Garvan Institute of Medical Research (Sydney), Royal Brisbane and Women's Hospital (Brisbane), Royal Adelaide Hospital, Sir Charles Gairdner Hospital Western Australia (Nedlands), Calvary Mater Newcastle, Austin Health Melbourne, Monash Health (Melbourne), and Fiona Stanley Hospital (Murdoch; all in Australia) reported at the SNMMI meeting on "^{177}Lu-PSMA-617 versus cabazitaxel in metastatic castration-resistant prostate cancer: A randomized, open-label, phase 2 trial (TheraP)" [1703] (*9*). Patients with progressive disease after docetaxel therapy at 11 sites in Australia were first imaged with both ^{68}Ga-PSMA and ^{18}F-FDG PET/CT. Only those with positive PSMA uptake that was concordant with FDG uptake were included in the trial. A resulting total of 200 men were then randomized to ^{177}Lu-PSMA-617 or cabazitaxel. Figure 6 includes examples from the study illustrating the concordant and discordant imaging findings used in patient selection. The patient on the top left, for example, showed low PSMA uptake and high FDG uptake, and so was ineligible for the trial. Next is a patient who had positive uptake of both tracers but with additional metastases seen only on FDG, a discordance that made the patient ineligible. This is in contrast to the eligible patients (bottom row) with concordant uptake on both scans and with PSMA-dominant findings. Imaging, then, was used to maximize the inclusion of patients most likely to benefit from ^{177}Lu-PSMA-617 treatment. ^{177}Lu-PSMA-617 led to significantly greater PSA reductions (66% experienced ≥50% reduction in PSA from baseline, compared with only 37% with cabazitaxel), higher objective response rates (49% vs. 24%; RECIST 1.1), longer progression-free survival at 1 year (19% vs. 3%), and significant improvements in several patient-reported outcome domains. Of note, the investigators also reported on comparative side effects. Patients in the ^{177}Lu-PSMA-617 arm experienced fewer grade 3 or 4 adverse events (53% vs 33%) and overall reported fewer side effects. We look forward to seeing immediate benefits with this life-saving and quality-of-life-improving treatment for our patients with prostate cancer. [*Author's note:* On the same day this lecture was given, the U.S. Food and Drug Administration announced that it had granted Breakthrough Therapy designation for ^{177}Lu-PSMA-617 in metastatic castration-resistant prostate cancer.]

In the context of radionuclide therapies, dosimetry is very important for both normal organs/tissues and target lesions. The process, however, can be quite time-consuming, requiring multiple scans on several subsequent days. Investigators across the globe are looking for solutions, particularly at whether advanced computational modeling can be used to derive dosimetry data with reasonable accuracy from a single time-point scan. Chicheportiche

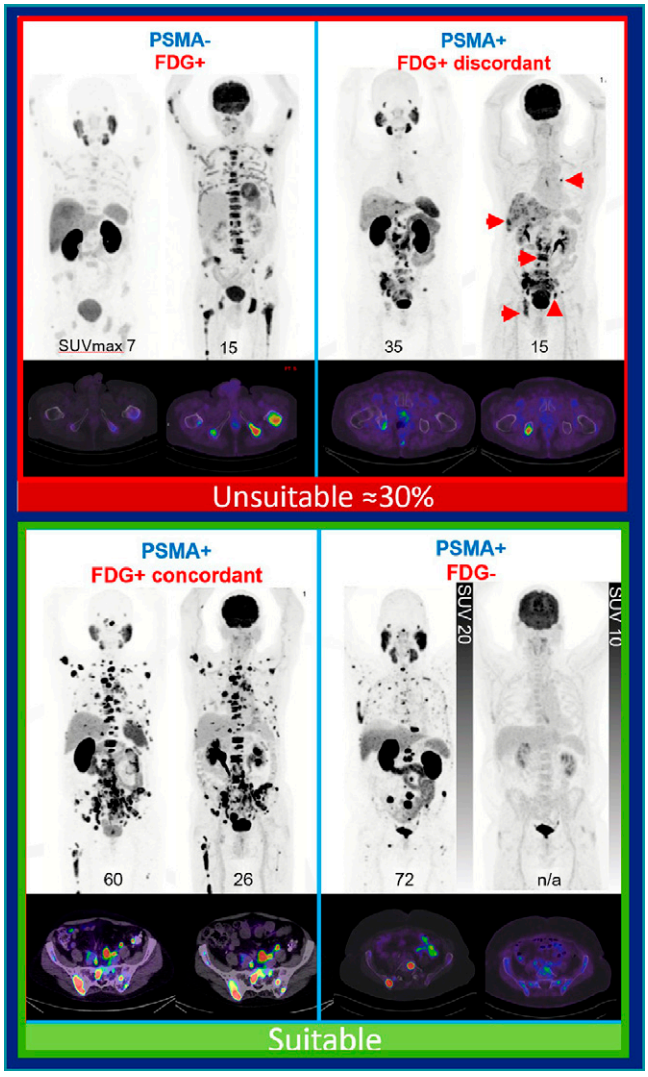

FIGURE 6. ^{177}Lu-PSMA-617 vs cabazitaxel in metastatic castration-resistant prostate cancer: TheraP trial. Patients with progressive disease after docetaxel therapy were first imaged with both ^{68}Ga-PSMA and ^{18}F-FDG PET/CT, and only those with positive PSMA uptake that was concordant with FDG uptake were included in the trial. Images show PET (top) and PET/CT (bottom row) illustrating concordant and discordant findings used in patient selection. Top box: A patient with low PSMA uptake and high FDG uptake (left, ineligible for the trial); patient with positive uptake of both tracers but additional metastases seen only on FDG (right, discordant, ineligible). Bottom row: patient with concordant uptake on both scans (left, eligible); and patient with PSMA-dominant findings (right, eligible). Imaging was used to maximize inclusion of patients most likely to benefit from ^{177}Lu-PSMA-617 treatment.

et al. from Hadassah–Hebrew University Medical Center (Jerusalem, Israel), Hebrew University of Jerusalem (Israel), and University College London/UCL Hospitals NHS Trust (London, UK) asked "Can absorbed radiation doses by organs and tumors after peptide-receptor radionuclide therapy (PRRT) be estimated from a single SPECT/CT study?" [18]. The aim was to assess the feasibility of using a single quantitative SPECT/CT study after each PRRT cycle combined with a trained multiple linear regression model for absorbed dose calculation. The researchers found that in

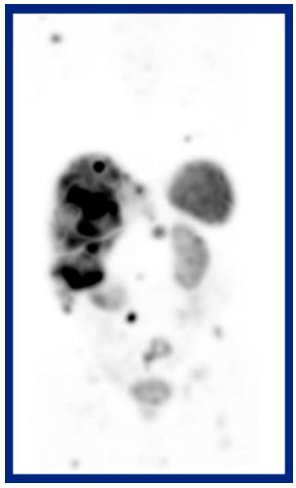

FIGURE 7. Single-timepoint imaging for dosimetry in peptide-receptor radionuclide therapy (PRRT). Researchers used a trained model for dose calculation with a single quantitative SPECT/CT study after each PRRT cycle for absorbed dose calculation (example image shown). The method was in good agreement with the standard multi-timepoint imaging protocol, with no associated changes in management decisions.

a test set with data from 40 patients, their dosimetry calculation method was in good agreement with the standard multi-timepoint imaging protocol, with no associated changes in management decisions (Fig. 7). The conclusion was that if this can be confirmed in a larger series it may very well be possible to perform a single scan to derive accurate dosimetry for PRRT and potentially other applications. This would result not only in simplification of the dosimetry process but also improved patient comfort and reduced scanner and staff time.

Interest continues in using nonimaging tools to improve our ability to predict and measure response to therapies. Blood-based molecular gene signatures are being incorporated into noninvasive tools to provide clinical guidance and facilitate management during PRRT, which may prove especially useful, because radiographic pseudoprogression is a known confounding factor during PRRT. Bodei et al. from Memorial Sloan Kettering Cancer Center (New York, NY), Wren Laboratories (Branford, CT), and Yale University School of Medicine (New Haven, CT) reported on "Blood-based genomic assessment of the clinical efficacy and toxicity of PRRT" [78]. These researchers used 3 independent blood-based gene expression assays: a 51-marker gene NETest (liquid biopsy) to monitor therapeutic efficacy, PRRT Predictor Quotient (a molecular marker used to predict PRRT responsiveness), and a 16-gene radiation toxicity assay to assess PRRT-related toxicity. In a cohort of ^{177}Lu-PRRT–treated patients with gastroenteropancreatic neuroendocrine and lung tumors, these assays were explored for their suitability in predicting treatment response, monitoring response, or use as safety biomarkers to monitor renal function and predict toxicity. Each of the assays showed quite positive results. This is a work in progress, and series with larger numbers are forthcoming. If validated, this will be a helpful tool in predicting and monitoring patient response to DOTATATE therapy in neuroendocrine tumors.

Morgan et al. from the University of Colorado Medical Center (Aurora) reported on "Utilization and cost of

^{223}Ra-dichloride (Xofigo) for treatment of metastatic castration-resistant prostate cancer in the U.S. Medicare population" [1309]. This is an interesting study because the authors looked not only at utilization patterns from 2015 to 2017 (a period during which they noted a significant increase) but at which physicians/disciplines were actually administering the therapy. More than 57% of treatments were administered by radiation oncologists. This seems to be a clear call to action for the nuclear medicine community. Two years ago, Czernin et al. published an article in *The Journal of Nuclear Medicine* highlighting potential weaknesses and challenges for nuclear medicine, including insufficient training, loss of ownership, and lack of desire to perform theranostic applications or to perform therapy (*10*). There is a reason that the word "medicine" is in the name of our discipline—we encompass both diagnosis and therapy. We can continue to administer therapy and expand the range of these activities only if we as a community have the collective desire to do so, as well as the skills, infrastructure, and training programs. This is an appeal to all nuclear medicine professionals to work together to remain as owners of our therapy and theranostic applications.

Part 2 of the 2021 Oncology and Therapy Highlights, in the November issue of Newsline, will focus on new targets for radionuclide therapy and other novel therapy approaches, as well as new techniques and methods for data analysis.

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SNMMI and ACGME Equity Matters Initiative

SNMMI announced on August 4 its partnership with the Accreditation Council for Graduate Medical Education (ACGME) in ACGME Equity Matters, a new initiative that introduces a framework for continuous learning and process improvement in diversity, equity, inclusion, and antiracism practices. The initiative aims to drive change within graduate medical education by increasing physician workforce diversity and building safe and inclusive learning environments, while promoting health equity by addressing racial disparities in health care and overall population health.

The ACGME Equity Matters framework includes 2 key components: (1) educational resources that will be available to all involved in GME; and (2) collaborative Learning Communities drawn from national stakeholder groups made up of GME Sponsoring Institutions and programs, including faculty members and individual residents/fellows, as well as specialty societies and other health care partners. The Council of Medical Specialty Societies (CMSS), of which SNMMI is a member, and the Organization of Program Director Associations (OPDA) launched their participation in the program with the convening of 2 Learning Communities that will initiate an 18-mo engagement cycle. This partnership will support diversity, equity, inclusion, and antiracist practices and policies across the full continuum from physician training to physicians in practice. Core teams from CMSS and OPDA members will include an elected leader to champion the initiative and senior executive leaders who will be accountable for implementing policy and practice changes.

The ACGME program will offer a phased curriculum to enable participants to move through progressively more complex concepts within 4 domains: acknowledgment, acceptance and accountability, action, and assessment and adaptation. Also included will be tools and skills training to drive implementation of innovative interventions, practices, policies, and data strategies. Forty-two organizations, including 31 CMSS Member Specialty Societies and 11 PDAs, will be participating in the inaugural 18-mo cohort of the learning communities. More information is available at: https://acgme.org/What-We-Do/Diversity-Equity-and-Inclusion/ACGME-Equity-Matters/.

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