ABNM CertLink: Update and "By the Numbers"

Kirk A. Frey, MD, PhD, Associate Executive Director, American Board of Nuclear Medicine

The American Board of Nuclear Medicine (ABNM) CertLink program is the mechanism offered to permit diplomates to satisfy American Board of Medical Specialties (ABMS) Maintenance of Certification (MOC) Part 3 requirements on a continuous, quarterly basis as opposed to a periodic (10-year cycle) half-day, high-stakes examination. CertLink offers several distinctive advantages over the previous periodic approach. Although CertLink provides the ABMS-required summative evaluation of diplomate cognitive ability, it is implemented in a formative context, providing participants with questions intended to emphasize common or new clinical aspects of nuclear medicine and molecular imaging. Each question item is accompanied by a critique describing the key concept, together with citation(s) to the literature for diplomates who want deeper understanding, particularly of new innovations in the field.

Approximately 1,250 active ABNM diplomates currently participate in the CertLink program, which launched in April 2018. Earlier this year, ABNM conducted a review and assessment of the program to determine direction(s) for potential future improvement. An important communication pathway leading to feedback from participating diplomates is the opportunity to provide comments to ABNM at the item response/review step in the examination. Review of the initial 3 years was based on the first 108 distinct exam items distributed, with the opportunity for up to 135,000 potential diplomate comments. ABNM received and reviewed 1,136 comments over this period. Each comment was reviewed and investigated by ABNM, but individual responses to commenting diplomates were beyond the scope of board resources. A majority of CertLink question items received diplomate comments. Twenty-six received $\geq$10 comments; of these, 8 items were excluded from final scoring on the basis of unanticipated problems. Several overall comment themes were identified.

Image Quality and Display. Frequent comments addressed difficulty in review of diagnostic images. In the current CertLink 2.0 release, images are an integral component within the question page, and the zoom feature of the workstation browser program must be employed. When finished zooming in on an image, the browser display must be reset to lower resolution to complete the question and see the next question. The ABNM CertLink FAQ and instruction page on the Web will be updated to document this approach. In addition, ABNM will further emphasize image quality and clarity in future published items, recognizing the critical image-rich aspect of nuclear medicine and molecular imaging practice.

Review of Questions and Images with Item Critique. Another frequent comment was the desire to re-review a question and images at the level of item feedback and critique stage of the examination. Current feedback is limited to identification of the correct vs. incorrect scoring of the diplomate response, together with a brief discussion of the key concept in the question and citation(s) to supporting literature. ABNM is investigating the possibility of redisplay of questions and images as a part of the feedback phase, and, if feasible, this will be added as an update to the examination procedure.

Key Point/Focus of Question(s). Diplomates also commented on the relationship of the key concept of an exam item to the current practice scope of the diplomate. In this context, it must be appreciated that ABNM certification covers the entire spectrum of practice in the field. ABNM does not offer subspecialty certifications for focused practice areas such as cardiovascular or pediatric nuclear medicine and molecular imaging or for diplomates who may not have ongoing experience with related therapy and theranostics. Continued ABNM certification applies to the entire breadth of nuclear medicine and molecular imaging content. An advantage of the CertLink approach is that it permits diplomates to remain current in aspects of practice that are potentially outside the constraints of their present practice—the formative aspect of CertLink, directing diplomates to literature resources for further learning and clarification.

Additional comments identified item-specific aspects. These included the possibility of incorrect scoring: incorrect key distractor, multiple correct distractors, or no correct distractor presented. Each comment was investigated by ABNM, and, in some instances, unanticipated problems with items were confirmed. In most such instances, such items were deleted from final scoring of the overall exam. In addition, ABNM conducts a retrospective psychometric statistical analysis of each item to identify items that did not perform as intended. In most instances, these were also deleted from final diplomate assessments, supporting the overall validity of the summative CertLink results for satisfaction of MOC Part 3 requirements.

ABNM CertLink is fully operational and functioning as intended. However, it is not a "final product" and will continue to undergo prospective changes and improvements, many at the suggestion of participating diplomates. Diplomates are encouraged to continue offering comments during item review. These constitute important input for potential program modifications. ABNM will further strengthen item delivery and feedback aspects of the program, with continued emphasis on supporting participant awareness of important clinical innovations and changes throughout all aspects of nuclear medicine and molecular imaging. Diplomates who have not yet activated participation in CertLink should consider enrolling to obtain the benefits of both ABMS Part 3 evaluation as well as formative resources and assistance with the evolving landscape of clinical practice.

Making Nuclear Medicine a Household Phrase

Munir Ghesani, MD, SNMMI President

Although certain medical terms are known to the general public—dialysis, biopsy, and chemotherapy, for example—nuclear medicine does not usually fall into that category. Nuclear medicine remains relatively unknown, misunderstood, and underutilized, to the detriment of patients. As nuclear medicine and molecular imaging professionals, we know the vital role that it plays in patient care. On behalf of the entire field, SNMMI is working to make sure that others outside of our community know it as well.

As part of SNMMI's Value Initiative, the society launched a robust consumer awareness campaign to educate the public about what nuclear medicine is and what it can accomplish. By translating the latest research and telling compelling stories, the society has successfully reached patients, caregivers, referring physicians, legislators, regulators, and payers about the benefits of nuclear medicine. In fact, in the campaign's first 6 months, stories about nuclear medicine and molecular imaging were featured in media reaching more than 1 billion consumers.

The consumer awareness campaign began with the creation of core messages focused on the fact that nuclear medicine can diagnose and treat disease effectively and safely, with minimal side effects and exceptional results for patients. With the latest advances in nuclear medicine therapies, messages were also developed about radiopharmaceutical treatments.

Once the key messages were drafted, a plan was made to garner media attention throughout the country and specifically in the Washington, DC, market, where a heavy concentration of regulators and legislators reside. The society developed relationships with reporters who cover science and health for major newspapers and magazines, radio, television, and online news publications. SNMMI promoted stories about recently published research in nuclear medicine and molecular imaging, connecting these stories to current events or occasions to provide relevance. Stories highlighting patients who have benefited from nuclear medicine imaging and therapy were also made available to the media.

Since the campaign's inception, the society has garnered many high-profile media placements. Nuclear medicine was spotlighted on the popular New York radio channel Q104.3 in a 3-part series with award-winning radio host Shelli Sonstein. The first interview in September 2021 focused on nuclear medicine as an innovative cancer treatment, and the second in February 2022 covered nuclear medicine in nononcologic disease. Sonstein saw so much value in these interviews that she had SNMMI back a third time this past July to discuss nuclear medicine as a tool to both diagnose and treat prostate cancer, as well as research from the Annual Meeting.

Munir Ghesani, MD

On the television front, SNMMI has secured interviews on many news shows. Placements include the Fox 5 DC Morning Show (unusual imaging patterns on ^{18}F-FDG PET/CT scans possibly due to COVID Omicron variant infections), Fox Good Day LA (PET/CT artificial intelligence model for predicting risk of future heart attack), ABC 7 DC News (cardiac nuclear medicine), NBC 4 DC News (nuclear medicine to diagnose and treat cancer), Fox 5 DC Good Day DC (nuclear medicine as a game-changer), Fox DC Weekend Show (nuclear medicine to diagnose colon cancer), Fox Good Day LA (nuclear medicine to treat Parkinson's disease), and DCTV District Life Show (nuclear medicine to diagnose and treat prostate cancer).

Nuclear medicine was also covered in several print and online publications. *CURE Magazine* published an article about the U.S. Food and Drug Administration approval of Pluvicto, interviewing Richard Wahl, MD, about the treatment. SNMMI patient advocates also represented the society in interviews with *Health Central Online*, *Authority Magazine,* and *Thrive Global*. *Authority Magazine* also interviewed Helen Nadel, MD, SNMMI vice president, about inspiring women in STEM fields.

Complementing our consumer awareness campaign, the society has also continued its outreach to patient and referring physician associations with the goal of educating patients and the medical community about the value of nuclear medicine, molecular imaging, and radionuclide therapy. SNMMI's Patient Advocacy Advisory Board (PAAB) advises the society on development of patient education materials and public policy. This year, the PAAB welcomed 2 new members: Cancer ABCs and the Pheo-Para Alliance. The society also educates referring physicians by presenting at events hosted by organizations such as the Pediatric Endocrine Society, Large Urology Group Practice Association, American Urological Association, and San Antonio Breast Cancer Symposium.

The consumer awareness campaign has seen much success, and this is only the beginning. As advances in nuclear medicine and molecular imaging continue—especially with the effectiveness and increased availability of radiopharmaceutical therapies—we expect that media interest in our field will continue to grow. And with more awareness from consumers, referring physicians, legislators, and other key audiences, nuclear medicine will be well on its way to becoming a common household phrase.

Bertagnolli to Serve as NCI Director

President Joe Biden announced on August 10 his intention to appoint Monica Bertagnolli, MD, as the 16th (and first woman) director of the National Cancer Institute (NCI). She currently serves as the Richard E. Wilson Professor of Surgery in surgical oncology at the Harvard Medical School, as well as a surgeon at the Brigham and Women's Hospital and a member of the Gastrointestinal Cancer and Sarcoma Disease Centers at the Dana–Farber Cancer Institute (all in Boston, MA). She has championed collaborative initiatives to transform the data infrastructure for clinical research and is the founding chair of the Minimal Common Oncology Data Elements (mCODE) Executive Committee. She is a past president and chair of the board of directors of the American Society of Clinical Oncology and has served on the board of directors of the American Cancer Society and the Prevent Cancer Foundation.

"I look forward to working with Dr. Bertagnolli to advance the President's call to end cancer as we know it," said Secretary Xavier Becerra, U.S. Health and Human Services, referring to the President's renewed Cancer Moonshot initiative. "Her decades of cancer research expertise around patient-centered care and her work to create more inclusive clinical trials will be instrumental as we accelerate the rate of research and innovation to fight cancer."

The White House

TerraPower Announces Funding Raised for Nuclear Technologies

Terrapower (Bellevue, WA) announced on August 15 the close of an equity raising effort that yielded >$750 million. The effort was led by TerraPower founder Bill Gates and by SK Inc./SK Innovation (Seoul, South Korea). Additional funding will come from other investors. According to a press release from TerraPower, this effort will enhance the company's "groundbreaking work in advanced nuclear energy technologies and nuclear medicine."

"TerraPower is committed to solving some of the toughest challenges that face this generation through innovation," said TerraPower President and CEO Chris Levesque. "Whether it's addressing climate change with carbon-free advanced nuclear energy or fighting cancer with nuclear isotopes, our team is deploying technology solutions, and investors across the world are taking note." TerraPower's recent growth has been driven in part by a U.S. Department of Energy (DOE) Advanced Reactor Demonstration Program (ARDP) award and the construction of the Natrium demonstration plant at a retiring coal facility in Wyoming. Part of the ARDP award requires a match of 50% of project costs, up to $2 billion.

The TerraPower Isotopes (TPI) program is "supporting the transformation of the fight against cancer by advancing the next generation of isotopes." Across a range of partnerships, the program is focusing on isotopic materials harvested from DOE storage to be used in targeted α therapy. The press release noted that TPI has "unique access to ^{225}Ac and is working to provide this isotope to the pharmaceutical community for the development of drugs that target and treat cancer." TerraPower's radiochemistry laboratory also supports other radioisotope development initiatives within the company as part of its nuclear innovation mission. For more information on the TPI, visit: https://www.terrapower.com/wp-content/uploads/2022/03/2022-TPI-Isotopes.pdf.

New European Data Law and FDA

In a perspective article published on August 9 by the U.S. Food and Drug Administration (FDA), Heather Messick, JD, an international policy analyst, looked at the current and likely future effects of the General Data Protection Regulation (GDPR), a law enacted by the European Union (EU) in 2018 requiring that organizations put in place certain measures to collect, use, or store personal data originating from persons in the European Economic Area (the 27 EU member states plus Iceland, Norway, and Lichtenstein) to ensure that the data are protected, even if transferred out of the area. The GDPR defines personal data as: "any information relating to an identified or identifiable natural person ("data subject"); an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, online identifier, or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural, or social identity of that person." Of note, coded data, referred to in the law as "pseudonymised data," are considered to be personal data and subject to the protections of the law. Messick outlined a number of concerns for the FDA in its current interactions with the EU, particularly in clinical and other scientific trials, New Drug Applications/Biologic License Applications, and adverse event reporting. The FDA is assessing implications for collaborative medical research involving sites in EU member states and the United States. In March, the EU and the United States agreed "in principle" on a new data agreement for cross-border transfers of personal privacy data for commercial purposes. The FDA will continue to monitor both requirements and interpretations of the GDPR in the coming year. The complete perspective article is available at: https://www.fda.gov/international-programs/global-perspective/how-european-data-law-impacting-fda.

U.S. Food and Drug Administration

NIH Centers of Excellence for Telehealth in Cancer Care

The National Cancer Institute (NCI) announced on August 18 that it will award $23 million to 4 academic institutions to establish centers of excellence to conduct research on the role of

telehealth in delivering cancer-related health care. The 5-y awards will establish the NCI Telehealth Research Centers of Excellence (TRACE) initiative, which is being supported by the Cancer Moonshot program to accelerate the rate of progress against cancer.

"One of the Cancer Moonshot goals is to make the cancer experience less burdensome for patients and their families and caregivers," said Katrina Goddard, PhD, director of the NCI Division of Cancer Control and Population Sciences. "We are awarding these centers of excellence to better understand how telehealth can contribute to improved health outcomes across the cancer care continuum."

The research being undertaken by the 4 centers will study the role of telehealth in fields from prevention to screening, diagnosis to treatment, and survivorship. Each center will be led by an academic institution that has assembled diverse teams of researchers to conduct large trials in real-world clinical settings such as hospitals, cancer centers, oncology practices, and primary care offices. The centers will be led by the New York University Grossman School of Medicine (NY), Northwestern University (Evanston, IL), the University of Pennsylvania (Philadelphia), and Memorial Sloan Kettering Cancer Center (New York, NY)

In addition to developing innovative ways to use telehealth in cancer care, the centers will focus on identifying and addressing telehealth-related disparities among vulnerable populations, including racial and ethnic groups, rural residents, older adults, people who are uninsured or have low incomes, people who are socially isolated, and people who have limited digital literacy. All participating centers are also committed to training the next generation of telehealth-focused researchers.

National Cancer Institute

DOE Medical User Group Meetings

The Department of Energy (DOE) Isotope Program held its Annual Medical Isotope User Group Meetings in a virtual format in September and October. The meetings, which focused on emerging α and β emitters, are organized to facilitate free discussion and collaboration among users of specific isotopes and to encourage information exchange about their applications in medicine. The webinar-style sessions featured brief presentations by leading researchers showcasing progress in these emerging fields, followed by interactive panel discussions. The ^{225}Ac User Group Meeting was held on September 1 and was moderated by Cathy Cutler, PhD, from the Brookhaven National Laboratory (Upton, NY). The ^{211}At User Group Meeting was held on September 6 and moderated by Yawen Li, PhD, from the University of Washington School of Medicine (Seattle). On September 19, the ^{134}Ce User Group Meeting was moderated by Stosh Kozimor, PhD, from the Los Alamos National Laboratory (NM). The final event, the ^{212}Pb User Group Meeting was moderated by Matt O'Hara from the Pacific Northwest National Laboratory (Richland, WA).

U.S. Department of Energy

Each month the editor of Newsline selects articles on diagnostic, therapeutic, research, and practice issues from a range of international publications. Most selections come from outside the standard canon of nuclear medicine and radiology journals. These briefs are offered as a window on the broad arena of medical and scientific endeavor in which nuclear medicine now plays an essential role. The lines between diagnosis and therapy are increasingly blurred, as radiolabels are used as adjuncts to treatment and/or as active agents in therapeutic regimens, and these shifting lines are reflected in the briefs presented here. We have also added a small section on noteworthy reviews of the literature.

^{18}F-Fluorocholine PET/CT and Parathyroid Imaging

Jacquet-Francillon et al. from the Saint-Étienne University Hospital/University of Saint-Étienne, Hospices Civils de Lyon, Université Jean Monnet (Saint-Étienne), and the Université de Lyon (Saint-Étienne; all in France) reported in the August 2 issue of *Frontiers in Medicine (Lausanne)* (2022;9: 956580) on a study evaluating the performance of quantitative criteria in ^{18}F-fluorocholine PET/CT for localization of hyperfunctioning parathyroid glands, as well as correlations between detection rates of ^{18}F-fluorocholine PET/CT and serum parathyroid hormone levels. The retrospective study included 120 patients (135 lesions) with biologic hyperparathyroidism who had undergone imaging with ^{18}F-fluorocholine PET/CT. Images were assessed first with visual analysis and then with a blinded reading of standardized measurements of SUV_{max} and liver, thyroid, and size ratios. Results were compared with histology, with a special emphasis on differentiation between adenomas and hyperplasias. The researchers found that areas under the receiver operating characteristic curve representing SUV_{max} and liver ratio were significantly increased in the study group; optimal cutoff values for these variables were >4.12 and >27.4, respectively. Beyond threshold values of SUV_{max} >4.12 and/or liver ratio >38.1, all lesions were confirmed to be adenomas on histology. ^{18}F-fluorocholine PET/CT was correlated with serum parathyroid hormone levels. The authors concluded that semiquantitative measurements (specifically, SUV_{max} and liver ratio) should be considered as additional tools in interpretation of ^{18}F-fluorocholine PET/CT. Although these quantitative parameters have lower overall performance than visual analysis, they have higher specificity in identifying adenomas, so that above certain PET/CT threshold values, all lesions are adenomas. PET/CT in this setting is also useful for detection of hyperfunctional parathyroids.

Frontiers in Medicine (Lausanne)

Discordant Understanding of the Freeform PET/CT Report in Head and Neck SCC

In an article published on August 18 ahead of print in *JAMA Otolaryngology: Head and Neck Surgery*, Patel et al. from the Wake Forest School of Medicine (Winston-Salem, NC) reported on a study focusing on clinicians' perceptions of PET/CT freeform reports and the incidence of discordance between clinician understanding and the intention of the nuclear medicine physicians generating the reports. The retrospective study included 171 patients (45 women, 126 men; median age, 61 y, range, 54–65 y) with head and neck squamous cell carcinoma (HNSCC; 149 with stage III–IV disease) in routine oncologic management who underwent ^{18}F-FDG PET/CT for assessment of response to radiation treatment with or without concurrent chemotherapy. Four clinicians independently reviewed the freeform PET/CT reports and assigned perceived modified Deauville scores (MDS). These results were then compared with the criterion standard nuclear medicine MDSs derived from image review. Clinical outcomes assessed included locoregional control, progression-free survival, and overall survival. The researchers found that although reliability/agreement between oncology clinicians was moderate ($\kappa = 0.68$), consensus was minimal ($\kappa = 0.36$) between clinicians and nuclear medicine physicians. Exact agreement between clinician consensus and nuclear medicine physicians was 64%. The authors concluded that "the results of this cohort study suggest that considerable variation in perceived meaning exists among oncology clinicians reading free-form HNSCC postradiation therapy PET/CT reports, with only minimal agreement between MDS derived from clinician perception and nuclear medicine image interpretation." These data suggest that nuclear medicine use of "a standardized reporting system, such as MDS, may improve clinician–nuclear medicine communication and increase the value of HNSCC postradiation treatment PET/CT reports."

JAMA Otolaryngology: Head and Neck Surgery

Improving Transthoracic Lung Mass Biopsy with Intraprocedural CT and Prior PET/CT Fusion

Lin et al. from the China-Japan Friendship Hospital (Beijing, China) and the Hospital Seberang Jaya (Penang, Malaysia) reported on August 13 in *BMC Pulmonary Medicine* (2022;22[1]: 311) on a study evaluating the utility of intraprocedural CT and prior PET/CT fusion imaging in improving the diagnostic yield of CT-guided transthoracic core-needle biopsy in lung masses. The study included 145 individuals with lung masses suspicious for malignancy scheduled to undergo image-guided transthoracic core-needle biopsy. Seventy-six patients had undergone PET/CT imaging $\leq$14 d before biopsy, and their imaging data were integrated with intraprocedural CT images. The resulting fused images were used to plan puncture sites. The remaining 69 patients underwent routine CT-guided biopsy procedures. Clinical characteristics, diagnostic yield of the biopsies, diagnostic accuracy, procedure-related complications, and procedure duration were compared between the 2 patient groups. Final clinical diagnosis

was determined by histopathology and/or at ≥6-mo follow-up. The overall diagnostic yield and accuracy rate were 80.3% and 82.9%, respectively, for the fusion imaging group, with corresponding percentages of 70.7% and 75.4% for the group under routine procedures. The diagnostic yield for malignancy in the fusion imaging group was higher than that in the routine group (98.1% and 81.3%, respectively). No serious procedure-related adverse events were noted in either of the groups. The authors concluded that "core-needle biopsy with prior PET/CT fusion imaging is particularly helpful in improving diagnostic yield and accurate rate of biopsy in lung masses, especially in heterogeneous ones, thus providing greater potential benefit for patients."

BMC Pulmonary Medicine

Fibroblast-Activation Protein Expression in Interstitial Lung Disease

In an article published on August 19 ahead of print in the *American Journal of Respiratory and Critical Care Medicine,* Yang et al. from the State Key Laboratory of Respiratory Disease (Guangzhou), the First Affiliated Hospital of Guangzhou Medical University, Southern Medical University (Guangzhou), Wuxi People's Hospital of Nanjing Medical University, General Hospital of Southern Theatre Command of PLA (Guangzhou), and the Shenzhen International Institute for Biomedical Research (all in China) reported on a study investigating whether the expression intensity of fibroblast-activation protein (FAP), a recognized surface biomarker of activated fibroblasts, can be used to estimate/measure the amounts of activated fibroblasts in interstitial lung disease (ILD). The researchers detailed multiple in vitro studies characterizing FAP expression in human primary lung fibroblasts and clinical lung specimens, including qPCR, Western blot, immunofluorescence staining, deep-learning measurement of whole-slide immunohistochemistry, and single-cell sequencing. They also analyzed FAP-targeted PET/CT imaging in patients with various ILDs to determine correlations between FAP tracer uptake and pulmonary function parameters. They found that FAP expression was significantly upregulated in the early phase of lung fibroblast activation in response to a low dose of profibrotic cytokine. Single-cell sequencing data indicated that almost all FAP-positive cells in ILD lungs were collagen-producing fibroblasts. Immunohistochemistry confirmed that FAP expression levels were closely correlated with fibroblastic foci on human lung biopsy sections from patients with ILDs. The total SUV for the FAP-inhibitor PET tracer was significantly related to lung function decline in these patients. The authors concluded that these results "strongly support that in vitro and in vivo detection of FAP can assess the profibrotic activity of ILDs, which may aid in early diagnosis and selection of an appropriate therapeutic window."

American Journal of Respiratory and Critical Care Medicine

Preoperative PET/CT in Advanced Serous Ovarian Cancer

Wang et al. from the First Affiliated Hospital of Chongqing Medical University, the People's Hospital of Yubei District of Chongqing City, and Chongqing General Hospital/University of Chinese Academy of Sciences (all in China) reported on August 18 ahead of print in *Acta Obstetricia et Gynecologica Scandinavica* on a study analyzing and comparing the predictive values of preoperative PET/CT score, CT score, metabolic parameters, tumor markers, and hematologic markers for incomplete resection after debulking surgery for advanced serous ovarian cancer. The retrospective study included data from 62 such patients who had undergone ^{18}F-FDG PET/CT imaging before primary or secondary debulking surgery. Variables assessed included PET/CT and CT predictive scores (based on the Suidan model), SUV_{max}, metabolic tumor volume, human epididymis protein 4, cancer antigen 125, lymphocyte-to-monocyte ratio, platelet-to-lymphocyte ratio, and neutrophil-to-lymphocyte ratio. Preoperative PET/CT was found to have the highest predictive value for incomplete resection in the primary debulking surgery group (sensitivity, 65.0%; specificity, 88.9%). In the secondary debulking surgery group, preoperative PET/CT and CT scores were the same but remained higher than the other tumor and hematologic variables (sensitivity, 80.0%; specificity, 94.7%). A preoperative PET/CT score ≥3 predicted a high risk of incomplete resection after primary debulking, and a preoperative PET/CT score ≥2 was highly predictive of incomplete resection after secondary debulking. The authors concluded that "the preoperative PET/CT score may be a feasible and quantitative model for predicting incomplete resection after debulking surgery for advanced serous ovarian cancer."

Acta Obstetricia et Gynecologica Scandinavica

Multiparametric Model for PET in Thymic Lesion Diagnosis

In an article published on August 16 in *BMC Cancer* (2022;22[1]:895), Wang et al. from the Beijing Friendship Hospital/Capital Medical University and the First Medical Center/Chinese PLA General Hospital (both in Beijing, China) reported on a study investigating the diagnostic performance of multiparametric ^{18}F-FDG PET combined with clinical characteristics in differentiating thymic epithelial tumors from thymic lymphomas. The study included 173 patients (80 with thymic epithelial tumors and 93 with thymic lymphomas) who underwent ^{18}F-FDG PET/CT before treatment. PET/CT parameters included in the evaluation were lesion size, SUV_{max}, SUV_{mean}, total lesion glycolysis, metabolic tumor volume, and tumor-to-normal liver SUV ratio. Clinical data were also included in assessing differential diagnostic and comparative efficacy. Age, clinical symptoms, and PET metabolic parameters were found to differ significantly between patients with thymic epithelial tumors and those with thymic lymphomas. The calculated SUV ratio showed the highest individual differentiating diagnostic value (sensitivity, 76.3%; specificity, 88.8%). A combined model of age, clinical symptoms,

and SUV ratio resulted in the highest differentiating diagnostic value (sensitivity, 88.2%; specificity, 96.3%). The clinical efficacy of the model was confirmed by further analysis. The authors concluded that this "multiparameter diagnosis model based on ^{18}F-FDG PET and clinical characteristics had excellent value in the differential diagnosis of thymic epithelial tumors and thymic lymphomas." They added that use of this model has the potential to avoid unnecessary treatment and surgery.

BMC Cancer

Tau Distribution in Early-Onset AD

Frontzkowksi et al. from University Hospital/LMU Munich (Germany), the German Center for Neurodegenerative Diseases (DZNE) (Munich, Germany), the Munich Cluster for Systems Neurology (SyNergy) (Germany), Lund University (Sweden), the Vrije Universiteit Amsterdam/Amsterdam UMC (The Netherlands), and Skåne University (Lund, Sweden) reported on August 20 in *Nature Communications* (2022;13[1]: 4899) on a study combining resting-state functional MR and longitudinal ^{18}F-flortaucipir PET imaging to investigate tau distribution and accumulation in individuals with early-onset AD. The study drew data from almost 300 participants in 2 independent clinical trials, each cohort including patients with biomarker-confirmed and symptomatic Alzheimer disease (AD), cognitively normal but amyloid-positive individuals, and cognitively normal controls with no AD-associated pathologies. High-resolution resting-state functional MR imaging data from 1,000 healthy participants was used to map the topology of globally connected "hubs" across the brain. ^{18}F-flortaucipir PET patterns in AD patients and others in the study were mapped to the topology of these globally connected hubs to determine the degree to which individual tau patterns are expressed in globally connected hub regions in the frontoparietal association cortex compared to weakly connected nonhub regions. Detailed imaging analyses indicated: (1) that individual tau deposition patterns on PET are stronger in globally connected hub regions in younger patients with symptomatic AD and that these patterns are associated with earlier symptom onset; (2) that this hub-like pattern of tau deposition at baseline PET is associated with subsequent accelerated tau accumulation on annual assessment; and (3) that this hub-like pattern contributes to the acceleration of cognitive decline. The authors concluded that "this suggests that earlier symptom manifestation is not driven by specific pathophysiological characteristics but rather by a tau distribution pattern that preferentially targets brain hubs important for cognitive function." They added that "knowledge about drivers of tau onset, heterogeneous tau spreading patterns, and clinical trajectories may become important to facilitate precision medicine prediction of cognitive and pathological progression, as well as for patient stratification in clinical trials."

Nature Communications

Articular ^{18}F-FDG Uptake in RA

In an article published online ahead of print in the *Journal of Rheumatology*, Ferraz-Amaro et al. from the Hospital Universitario de Canarias (Tenerife. Spain), Kettering Health (Dayton, OH), and Columbia University College of Physicians and Surgeons (New York, NY) reported on a study using ^{18}F-FDG PET/CT to quantify joint inflammation in rheumatoid arthritis (RA) and explore correlations between PET-derived uptake parameters and RA disease activity measures. The authors studied 34 patients with RA who were part of the Rheumatoid Arthritis Study of the Myocardium. Associations between disease activity scores and articular ^{18}F-FDG SUVs were calculated. Weighted joint volume SUVs representing 25%, 50%, 75% and maximal (100%) uptake were calculated as global parameters of the total volume of joint inflammation in each patient. The 25%, 50%, and 75% weight joint volume SUVs were found to be significantly correlated with the number of swollen joints. No associations were found between articular FDG uptake and nonarticular RA-related variables, such as disease duration, seropositivity, or RA treatments. The authors concluded that although articular FDG uptake was significantly correlated with the number of swollen joints in RA, it was not associated with biochemical measures of inflammation and disease activity.

Journal of Rheumatology

Reviews

Review articles provide an important way to stay up to date on the latest topics and approaches through valuable summaries of pertinent literature. The Newsline editor recommends several general reviews accessioned into the PubMed database in August. Sparano et al. from the University of Florence (Italy) and the Institut Gustave Roussy/Université Paris-Saclay (Villejuif, France) provided an overview of "Strategies for radioiodine treatment: What's new?" in the August 4 issue of *Cancers (Basel)* (2022;14[15]: 3800). In the August 3 issue of the *Journal of Clinical Medicine* (2022:11[15]: 4514), Dondi et al. from the ASST Spedali Civili di Brescia (Italy), the Università degli Studi di Brescia (Italy), Ente Ospedaliero Cantonale (Bellinzona, Switzerland), Lausanne University Hospital/University of Lausanne (Switzerland), and the Università della Svizzera Italiana (Lugano, Switzerland) surveyed the "Emerging role of FAPI PET imaging for the assessment of benign bone and joint disease." Albano and experts from the same universities reported in the August 5 issue of *Cancers (Basel)* (2022; 14[15]:3814) on "The role of [^{68}Ga]Ga-pentixafor PET/CT or PET/MRI in lymphoma: A systematic review." In the same issue of *Cancers (Basel)* (2022;14[15]: 3768), Rasul and Haug from the Medical University of Vienna (Austria) summarized "Clinical applications of PSMA PET examination in patients with prostate cancer."