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 monthly 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 sometimes blurred, as radiolabels are increasingly used as adjuncts to therapy 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.

Aortic Inflammation and Coronary Plaque in Psoriasis

Joshi et al. from the National Heart, Lung, and Blood Institute (Bethesda, MD), the University of Wisconsin School of Medicine and Public Health (Madison), the National Institutes of Health Clinical Research Center (Bethesda, MD), and the University of Pennsylvania (Philadelphia) reported on September 12 ahead of print in *JAMA Cardiology* on a study assessing associations between aortic vascular inflammation as characterized by ^{18}F-FDG PET/CT coronary artery disease (CAD) indices (including total plaque burden, noncalcified coronary plaque burden, and luminal stenosis) and high-risk plaque prevalence in individuals with psoriasis. The study, conducted at the National Institutes of Health, included 215 patients (126 men, 89 women; mean age, 50.4 y) with psoriasis. All patients underwent ^{18}F-FDG PET/CT imaging for aortic vascular inflammation, and 190 patients from this group underwent coronary CT angiography to assess CAD. Patients with increased aortic vascular inflammation on PET/CT were found to have increased total plaque burden and a higher prevalence of luminal stenosis. The association between aortic vascular inflammation and total plaque burden was primarily the result of noncalcified coronary plaque burden, whereas the association between aortic vascular inflammation and high-risk plaque prevalence was the result of low-attenuation plaque. These associations remained valid after adjustment for other cardiovascular risk factors. Associations were not identified between aortic vascular inflammation and dense-calcified coronary plaque burden. The authors concluded that "aortic vascular inflammation is associated with broad CAD indices, suggesting that aortic vascular inflammation may be a surrogate for early CAD."

JAMA Cardiology

Data Entry Inconsistencies and PET Quantification

In an article in the September issue of *Medicine (Baltimore)* (2018;97: e12312), Nguyen et al. from Odense University Hospital (Denmark), Technical University of Denmark (Kongens Lyngby), and the University of Southern Denmark (Odense) reported on a survey of lapses/errors in human data registration and protocol compliance and their effects on PET quantification, reproducibility of results, and data harmonization in multisite clinical trials. The researchers performed a retrospective audit of errors in manual registration of study parameters and in protocol adherence across a sample of in-center research projects in a 1-y period (201 patients, 222 PET/CT scans). Among the factors assessed were: discrepancies in patient height and weight, tracer type, dose, injection, scan times, SUVs, and SUVs normalized by body weight and body surface area. More than 40% of patient records showed errors in manual entries. Although most were small, a few large deviations were noted, most significantly in weight (deviance range: –1–100 kg) and dose (–19–12 MBq). Errors were more frequent and, in general, larger in studies that were not routine. Such errors resulted in noncompliance in many cases. A 50.7% noncompliance rate was identified, with significant deviations in dose (–106–208 MBq) and in early scan uptake times (–37–54 min). The authors found that although misregistrations were not associated overall in the study with significant SUV variability, noncompliance was associated with such variability. Errors in dose and early scan uptake times contributed respective change factors of 0.02–1.45 and 0.71–3.09 SUV (normalized by body weight). SUV by body surface area had a significant 21%–22% decrease when height and weight were erroneously entered. In general, inconsistency was frequent but less significant in data entry than in protocol compliance. The authors concluded that because errors in both these activities "caused some substantial SUV variances, intrasite assessments and data checking are required for clinical trials."

Medicine (Baltimore)

Pretreatment ^{18}F-FDG PET/CT and Ovarian Cancer Metastasis

Han et al. from the University of Ulsan College of Medicine and Seoul National University College of Medicine (both in Seoul, Korea) reported in the November issue of the *Journal of Gynecologic Oncology* (2018;29:e98) on a systematic review and metaanalysis of the utility of ^{18}F-FDG PET/CT (acquired for pretreatment staging) for detection of metastasis in ovarian cancer. After a survey of major databases, 8 studies with a total of 594 patients were included in the analysis. The overall pooled sensitivity was 0.72, and specificity was 0.93, with heterogeneity in both sensitivity and specificity. Studies that reported on laparotomy as the reference standard showed significantly higher sensitivity and specificity (0.77 and 0.96, respectively) than those including diagnostic laparoscopy (0.62 and 0.84, respectively). Pathologic confirmation was associated with higher specificity. Studies with a lower prevalence of the ^{18}F-FDG–avid subtype showed higher specificity than those with a greater prevalence (0.97 and 0.89, respectively). The authors concluded that "pretreatment ^{18}F-FDG PET/CT shows moderate sensitivity and high specificity for detecting metastasis in ovarian cancer" and that "with its low

false-positive rate, it can help select surgical approaches or alternative treatment options."

Journal of Gynecologic Oncology

Bone Scintigraphy Vs. PET in Histologic Response Prediction in Osteosarcoma

In an article published in September in *Medicine (Baltimore)* (2018;97: e12318), Lee et al. from the Korea Institute of Radiological and Medical Sciences (Seoul) compared the utility of ^{99m}Tc-methyldiphosphonate (^{99m}Tc-MDP) bone scintigraphy and that of ^{18}F-FDG PET/CT in prediction of histologic response in patients with osteosarcoma undergoing neoadjuvant chemotherapy. The retrospective study included 62 patients with high-grade osteosarcoma who had undergone 2 cycles of neoadjuvant chemotherapy as well as surgery. All patients underwent both ^{99m}Tc-MDP bone scintigraphy and ^{18}F-FDG PET/CT before and after chemotherapy. Uptake on scintigraphy in the primary tumor was assessed quantitatively as the maximum tumor-to-nontumor ratio, whereas uptake on PET/CT was measured as the maximum SUV (SUV_{max}). Percent changes in these parameters after neoadjuvant chemotherapy were evaluated. The effects of chemotherapy were graded by histopathology after surgery as good or poor. Optimal cut-off values for percent changes in maximum tumor-to-nontumor ratio and SUV_{max} for predicting histologic response were assessed and found to be positively correlated. Using receiver operator characteristic analysis, percent changes in maximum tumor-to-nontumor ratio and SUV_{max} predicted good histologic response. The sensitivity and specificity for predicting good histologic response were 83.3% and 75.0%, respectively, using a percentage change of maximum tumor-to-nontumor ratio of $<$12.5% and 80.0% and 81.3%, respectively, for a percentage change in SUV_{max} $<$49.0%. The authors concluded that these data indicate that neither the ^{99m}Tc-MDP bone scan nor ^{18}F-FDG PET/CT was inferior in predicting histologic responses in osteosarcoma treatments, with each showing advantages with differing features. They concluded that "physicians should consider which scan is appropriate for their own institute based on the advantages of each scan and the circumstances of the institute."

Medicine (Baltimore)

^{11}C-Acetate PET/CT in Prostate Cancer Nodal Metastases

Rajarubendra et al. from the University of Southern California (Los Angeles), Phoenix Molecular Imaging (AZ), and the University of Tennessee (Memphis) reported on September 12 ahead of print in *The Journal of Urology* on histologic validation of ^{11}C-acetate PET/CT in identification of prostate cancer nodal metastases and assessment of factors that influenced detection rates. The study included 25 patients with ^{11}C-acetate–avid PET/CT-imaged pelvic/retroperitoneal lymph nodes who underwent high-extended robotic lymphadenectomy. A standardized mapping template with 8 predetermined anatomic regions was used during lymphadenectomy for matched, region-based analysis and comparison of imaging and histologic data. A total of 2,149 lymph nodes were excised (mean, 86 nodes per patient; range, 27–136 nodes), with 528 (22%) identified as metastases (mean, 21 positive nodes per patient; range, 0–109). A total of 174 anatomic regions in the excised nodes showed matching hematologic and imaging data. PET/CT accurately identified 48 node-positive regions and accurately ruled out 88 regions as metastasis free. The sensitivity, specificity, and positive and negative predictive values of ^{11}C-acetate PET/CT were 67%, 84%, 74%, and 79%, respectively. An increasing histology-measured metastatic lesion size in the long-axis diameter correlated with improved ^{11}C-acetate detection rates. Each SUV unit increase correlated with a 1.9-mm increase in nodal long-axis diameter and a 1.2-mm increase in short-axis diameter. Positive ^{11}C-acetate PET/CT imaging also correlated with histologic lymph node size, metastatic lesion size, and extranodal extension. The authors concluded that although ^{11}C-acetate PET/CT imaging can identify prostate cancer metastatic nodal disease, "it underestimates true cephalad extent of nodal involvement, performing better in pelvis than retroperitoneum," adding that SUV, histologic nodal size, intranodal metastasis size, and extranodal extension are correlated with cancer-bearing nodes.

The Journal of Urology

Reviews

Review articles provide an important way to stay up to date on the latest topics and approaches by offering valuable summaries of pertinent literature. The Newsline editor recommends several general reviews and commentary accessioned into the PubMed database in September. Van Nostrand, from MedStar Health Research Institute and Washington Hospital Center (Washington, DC) reported in the September issue of *Thyroid* (2018;28:1083–1093) on "Radiation refractory differentiated thyroid cancer: Time to update the classifications." In an article in the September issue of *Best Practices & Research. Clinical Haematology* (2018;31:285–292). Melani et al. from the National Institutes of Health (Bethesda, MD) reviewed "Monitoring clinical outcomes in aggressive B-cell lymphoma: From imaging studies to circulating tumor DNA." Turner et al. from the University of Western Australia (Perth) provided "An introduction to the clinical practice of theranostics in oncology" on September 4 ahead of print in the *British Journal of Radiology.* Current aspects of knowledge and practice were addressed in "Differentiating disease flare from infection: A common problem in rheumatology. Do ^{18}F-FDG PET/CT scans and novel biomarkers hold the answer?" in the September 17 issue of *Current Rheumatology Reports* (2018;20:70) by Mabey et al. from King's College London and King's College Hospital NHS Foundation Trust (both in London, UK). Pesapane et al. from the University of Milan Postgraduate School of Radiodiagnostics (Italy), the National Cancer Institute (Bethesda, MD), Azienda Socio-Sanitaria Territoriale dei Sette Laghi (Varese, Italy), and Ghent University Hospital (Belgium) summarized current approaches in "Imaging of distant metastases of prostate cancer" in the September 14 issue of *Medical Oncology* (2018;35:10).