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.

[124]I and ^{18}F-FDG PET/CT and DTC

Lee et al. from the Eulji Medical College Hospital (Seoul, Korea) reported in the September issue of the *Journal of Korean Medical Science* (2012;27:1019–1026) on the diagnostic value of [124]I and ^{18}F-FDG as PET/CT tracers for localizing both iodine- and non-iodine-avid recurrence of differentiated thyroid carcinoma (DTC). The effectiveness of this combined PET approach was compared with that of ^{131}I scans and/or neck ultrasonography. The study included 19 patients with DTC and elevated thyroglobulin levels but without lesions on conventional imaging modalities. All patients underwent total thyroidectomy and radioiodine treatment and were followed for a mean of 13 mo (range: 6–21 mo) after the last radioiodine treatment session. The success of [124]I and ^{18}F-FDG PET/CT in detecting recurrent lesions was compared with that of other radiologic and/or cytologic studies. Of the 19 patients, 9 (47.4%) showed pathologic ^{18}F-FDG ($n = 5$, 26.3%) or [124]I ($n = 4$, 21.1%) uptake on PET and were deemed to be true-positives. Among these patients, information from PET changed management in 6 (66.7%) and resulted in restaging in 7 (77.8%) patients. Combined [124]I and ^{18}F-FDG PET/CT optimized planning of surgical resection for locoregional recurrence in 4 (21.1%) of the 19 patients, each of whom was found to be disease free during the postsurgical follow-up period. The authors concluded that the combination of [124]I and ^{18}F-FDG PET/CT "affords a valuable diagnostic method that can be used to make therapeutic decisions in patients with DTC who are tumor-free on conventional imaging studies but who have high thyroglobulin levels."

Journal of Korean Medical Science

PET and Adipose Depots in Glucose Metabolism

In an article e-published on September 11 ahead of print in the *American Journal of Physiology. Endocrinology and Metabolism*, Ng et al. from the University of Pittsburgh (PA) reported on dynamic PET studies to examine the contributions of both metabolic activity and volume of abdominal subcutaneous, visceral, and gluteal–femoral adipose tissue (SAT, VAT, and GFAT, respectively). The study included 15 nonobese, healthy volunteers who underwent dynamic PET imaging to assess uptake of ^{18}F-FDG during steady-state insulin infusion. PET images were coregistered with MR images to calculate insulin-stimulated rates of fractional glucose uptake in tissue, and adipose volumes were calculated. The authors found that VAT had significantly higher rates of fractional glucose uptake per volume than did SAT or GFAT. The rate of fractional glucose uptake in GFAT was positively correlated with systemic insulin sensitivity and negatively with insulin-suppressed free fatty acids. VAT mass correlated negatively with the glucose disappearance rate, but GFAT mass did not. The authors concluded that "rates of fractional glucose uptake within GFAT and VAT are significantly and positively associated with systemic insulin sensitivity in nonobese subjects" and that although "SAT and VAT amounts are confirmed to relate to systemic insulin resistance, GFAT amount is not associated with insulin resistance." These PET studies suggest that "both quantity and quality of specific AT depots have distinct roles in systemic insulin resistance and may help explain the metabolically obese but normal weight phenotype."

American Journal of Physiology. Endocrinology and Metabolism

PET and Sarcoidosis

Mostard et al. from the University of Maastricht and Atrium Medical Center Heerlen (The Netherlands) and University Hospital Gasthuisberg (Leuven, Belgium) reported in the September 14 issue of *BMC Pulmonary Medicine* (2012;12:57) on a study designed to develop a prediction rule that could be used to identify symptomatic sarcoidosis patients with appropriate indications for ^{18}F-FDG PET/CT assessment of inflammatory activity. The retrospective study included 95 sarcoidosis patients with non–organ-specific persistent disabling symptoms. The authors constructed a prediction rule based on the results of soluble interleukin-2 receptor assessment and high-resolution CT data and designed to be easily implemented in clinical practice. The performance of the model was evaluated and calibrated with the PET/CT data. The resulting prediction rule showed good overall performance and successfully discriminated between patients with positive and negative PET findings. In the predictive rule, a positive predictive value for the presence of inflammatory activity ≥ 90% was acceptable for clinical decision making without referral to PET. If such a rule were followed, PET would have been indicated in only 29.5% of patients in the study. Using a positive predictive value of 98%, about half of these patients (46.3 %) would have been referred to PET. The authors concluded that the predictive rule "appeared to be useful to identify

sarcoidosis patients with a high probability of inflammatory activity" and "may enable a more effective use of PET scan for assessment of inflammatory activity in sarcoidosis."

BMC Pulmonary Medicine

DAT Imaging and Parkinson Outcomes

In an article e-published on September 13 ahead of print in *Movement Disorders*, Ravina et al. from Biogen Idec (Cambridge, MA) reported on a study measuring the prognostic value of dopamine transporter (DAT) imaging for motor and nonmotor outcomes in patients with Parkinson disease (PD). The study included 537 participants in a clinical trial who underwent motor, cognitive, and behavioral assessments as well as ^{123}I-β-CIT SPECT at baseline and after 22 mo. Of the 537 participants, 491 (91%) showed evidence of dopamine deficiency on baseline scans, and these patients made up the study group for additional follow-up over 5.5 y. The authors found lower striatal binding at baseline to be independently associated with higher numbers of clinical progression milestones and measures of disease severity, including motor-related disability, falling and postural instability, cognitive impairment, psychosis, and clinically significant depressive symptoms. Those in the lowest quartile for striatal binding were at much higher risk for cognitive impairment and psychosis than those in the highest quartile. Rate of DAT binding change between the 2 scans was also independently associated with motor, cognitive, and behavioral outcomes. The authors concluded that ^{123}I-β-CIT SPECT DAT imaging "shortly after the diagnosis of PD was independently associated with clinically important long-term motor and nonmotor outcomes," a finding that may provide the rationale for additional studies.

Movement Disorders

Multimodal Hypoxia Imaging and IMRT

Askoxylakis et al. from the University of Heidelberg and the German Cancer Research Center (both in Heidelberg, Germany) reported in an article e-published on September 14 ahead of print in *Radiation Oncology* on a prospective study combining multimodal imaging with ^{18}F-FMISO dynamic PET/CT and functional MR to visualize tumor hypoxia before intensity-modulated radiation therapy (IMRT). The ongoing trial includes 15 patients with inoperable stage 3 non–small cell lung cancer (NSCLC), each of whom have undergone or will undergo ^{18}F-FDG PET/CT, serial ^{18}F-FMISO PET/CT, and functional MR imaging before treatment, at wk 5 of radiation therapy, and 6 wk after treatment completion. The authors described the protocols for therapy and evaluation of results. The specific aims of the study are to characterize the correlation of ^{18}F-FMISO dynamic PET/CT and functional MR for tumor hypoxia imaging in NSCLC and to assess the effects of radiation therapy on tumor reoxygenation. Additional objectives include generation of data on the prognostic value of ^{18}F-FMISO dynamic PET/CT and functional MR imaging for locoregional control, progression-free survival, and overall survival in NSCLC treated with IMRT. The research group hopes to use the results of this smaller study to launch "larger clinical trials focusing on possible interactions between tumor oxygenation and radiotherapy outcome."

Radiation Oncology

SPECT and SLN Excision in Melanoma

In an article appearing in the September 12 issue of *The Journal of the American Medical Association* (2012;308:1007–1014), Stoffels et al. from the University of Essen–Duisburg (Germany) reported on a study comparing the abilities of SPECT/CT-aided sentinel lymph node (SLN) excision and standard SLN excision techniques to detect metastatic nodes and predict disease-free survival in patients with melanoma. The study included 403 patients who underwent SLN excision, with ($n = 149$) or without ($n = 254$) preoperative SPECT/CT. The use of SPECT/CT was found to facilitate SLN excision in the head and neck area more frequently and detected more SLNs per patient than the standard approach. The number of positive SLNs per patient was significantly higher in the SPECT/CT group than in the standard group, and local relapse rates were lower in the SPECT/CT group, resulting in prolonged 4-y disease-free survival (93.9% in the SPECT/CT group; 79.2% in the standard approach group). The authors concluded that "among patients with clinically lymph node-negative melanoma, the use of SPECT/CT-aided SLN excision compared with SLN excision alone was associated with a higher frequency of metastatic involvement and a higher rate of disease-free survival."

The Journal of the American Medical Association

REVIEWS ———————————

Review articles provide an important way to stay up to date on the latest topics and approaches by providing valuable summaries of pertinent literature. The Newsline editor recommends several reviews accessioned into the PubMed database in August and September. In an article e-published on September 6 ahead of print in the *Journal of Crohn's & Colitis*, Treglia et al. from the Catholic University of the Sacred Heart (Rome, Italy) described "Diagnostic performance of fluorine-18-fluorodeoxyglucose positron emission tomography in patients with chronic inflammatory bowel disease: a systematic review and a meta-analysis." In an article e-published on August 29 ahead of print in the *Journal of Oncology*, Peñuelas et al. from the University Clinic of Navarra (Pamplona, Spain) reviewed current "PET tracers for clinical imaging of breast cancer." Di Gialleonardo and colleagues from the University of Groningen (The Netherlands), University Sapienza (Rome, Italy), and the Clinica Colsanitas SA (Bogotá, Columbia) provided an overview of "Imaging of β-cell mass and insulitis in insulin-dependent (type 1) diabetes mellitus," published on August 13 ahead of print in *Endocrine Reviews*. In an article in the August issue of *Topics in Antiviral Medicine* (2012;20:116–118), Rossotti et al. from the Niguarda Cà Granda Hospital (Milan, Italy) described "FDG PET imaging in the diagnosis of HIV-associated multicentric Castleman disease: something is still missing."