Commentary

There is increasing shift from apprentice type training models in radiology residency programs to more structured educational programs with an increased emphasis on formal and semi-formal teaching sessions taking centre stage in all training schemes. This global shift began in the North American programs and has gradually gained acceptance in other regions. The current training curriculum prescribed by the College of Physicians and Surgeons of Pakistan for Diagnostic Radiology also emphasises this aspect. On this background Meyer et al article from the current issue of Academic Radiology is interesting in as much as it suggests that the evidence for the evidence of benefit from this shift is not necessarily supportive.

Carrying on with the theme of looking for evidence to support what has already become or is on the way of becoming standard medical practice. Pyrexia of unknown origin (PUO) is now a widely accepted indication for FDG PET. Both American College of Radiology appropriateness criteria and Royal College Of Radiologists practice guidelines now include FDG PET in the work up for PUO. Bharucha et al undertook a systemic review to look for evidence to support this and found that there is not a lot of it out there. This may not necessarily mean that FDG PET should not be used in PUO only that there is no strong evidence at present and that better studies are required.

Talking of shifting trends in healthcare there is an increasing trend in using MR instead of CT for characterising liver lesions in patients with cirrhosis. Basha et al find that the two modalities are complimentary. MRI produces higher accuracy and sensitivity, while CT produces higher specificity. Their use together improves Li-Rads characterisation. This data however may not be relevant to our setting as there are cost and social determinants that will modify healthcare behaviour. We need robust evidence based locally relevant guidelines for the management of conditions that are our everyday problems. Chronic viral hepatitis and its consequences is one such condition.

Suh et al bring us another systematic review. This time looking at the endpoint for chemoradiation for glioblastoma multiforme. A difficult question in these cases is differentiating true progression from pseudo-progression. Increasingly multi-parametric MRI is used in this setting with an emphasis on perfusion imaging. This adds a layer of complexity to the clinical situation and also adds cost. The systemic review finds that based on the current evidence, mono-parametric and multiparametric MRI perform equally in the clinical context. Further evaluation will be needed.

Tian and Xu describe an interesting application of doppler ultrasound for the differentiating tuberculous from neoplastic pleural involvement. This offers a low(er) cost alternative to CT for this relatively common dilemma in our local setting.

Conflict of Interest: None

Prof. Zafar Sajjad
Professor of Radiology
Aga Khan University Hospital, Karachi, Pakistan.

Nathaniel B. Meyer, Kara Gaetke-Udager, Kimberly L. Shampain, Amy Spencer, Richard H. Cohan and Matthew S. Davenport

(Lack of) Measurable Clinical or Knowledge Gains From Resident Participation in Noon Conference

RATIONALE AND OBJECTIVES: The objective of this study was to determine whether noon conference attendance by diagnostic radiology residents is predictive of measurable performance.

METHODS: This single-center retrospective Health Insurance and Portability and Accountability Act (HIPAA)-compliant cross-sectional study was considered "not regulated" by the institutional review board. All diagnostic radiology residents who began residency training from 2008 to 2012 were included (N?=?54). Metrics of clinical performance and knowledge were collected, including junior and senior precall test results, American Board of Radiology scores (z -score transformed), American College of Radiology in-training scores (years 1–3), on-call "great call" and minor and major discrepancy rates, on-call and daytime case volumes, and training rotation scores. Multivariate regression models were constructed to determine if conference attendance, match rank order, or starting year could predict these outcomes. Pearson bivariate correlations were calculated.

RESULTS: Senior precall test results were moderately correlated with American Board of Radiology (r = 0.41) and American College of Radiology (r = 0.38 - 0.48) test results and mean rotation scores (r = 0.41), indicating moderate internal validity. However, conference attendance, match rank order, and year of training did not correlate with (r = -0.16 - 0.16) or predict (P >.05) measurable resident knowledge. On multivariate analysis, neither match rank order (P = .14 - .96) nor conference attendance (P = .10 - .88) predicted measurable clinical efficiency or accuracy. Year started training predicted greater cross-sectional case volume (P < 0.0001, β = 0.361 - 0.516) and less faculty-to-resident feedback (P < 0.0001, β = [-0.628] - [0.733]).

CONCLUSIONS: Residents with lower conference attendance are indistinguishable from those who attend more frequently in a wide range of clinical and knowledge-based performance assessments, suggesting that required attendance may not be necessary to gain certain measurable core competencies.

T. Bharucha, A. Rutherford, S. Skeoch, A. Alavi, M. Brown, J. Galloway

Diagnostic yield of FDG-PET/CT in fever of unknown origin: A systematic review, meta-analysis, and Delphi exercise

AIM: To perform a systematic review, meta-analysis and Delphi exercise to evaluate diagnostic yield of combined 2-[18F]-fluoro-2-deoxy-d-glucose (FDG) positron-emission tomography and computed tomography (FDG-PET/CT) in fever of unknown origin (FUO).

MATERIALS AND METHODS: Four databases were searched for studies of FDG-PET/CT in FUO 1/1/2000–1/12/2015. Exclusions were non-English language, case reports, non-standard FDG radiotracer, and significant missing data. Quality was assessed by two authors independently using a standardised tool.

Pooled diagnostic yield was calculated using a random-effects model. An iterative electronic and face-to-face Delphi exercise generated interspeciality consensus.

RESULTS: Pooled diagnostic yield was 56% (95% confidence interval [CI]: 50–61%, I2=61%) from 18 studies and 905 patients. Only five studies reported results of previous imaging, and subgroup analysis estimated diagnostic yield beyond conventional CT at 32% (95% CI: 22–44%; I2=66%). Consensus was established that FDG-PET/CT is increasingly available with an emerging role, but there is prevailing variability in practice.

CONCLUSION: There is insufficient evidence to support the value of FDG-PET/CT in investigative algorithms of FUO. A paradigm shift in research is needed, involving prospective studies recruiting at diagnosis of FUO, with updated case definitions and hard outcome measures. Although these studies will be a significant undertaking with multicentre collaboration, their completion is vital for balancing both radiation exposure and costs against the possible benefits of utilising FDG-PET/CT.

Mohammad Abd Alkhalik Basha, Mohamad Zakarya AlAzzazy, Ayman F. Ahmed, Hala Y. Yousef, Samar Mohamad Shehata, Dena Abd El Aziz El Sammak, Talaat FathyAhmed Ali Obaya, Eman H. Abdelbary

Does a combined CT and MRI protocol enhance the diagnostic efficacy of LI-RADS in the categorization of hepatic observations? A prospective comparative study

OBJECTIVE: To compare diagnostic performance and agreement between CT, MRI and combined CT/MRI in reference to LI-RADS classification system to categorize hepatic observations detected in hepatic patients during screening ultrasound.

METHODS: 240 patients with 296 liver observations detected during ultrasound surveillance underwent hepatic CT and MRI examinations, histopathology, and clinical and radiological follow-up. Using LI-RADS v2014, six radiologists evaluated the observations independently and assigned a LI-RADS category to each observation using CT, MRI and combined CT/MRI.

RESULTS: Combined CT and MRI in LI-RADS yielded better accuracy (91.29 %), sensitivity (90.71 %) and specificity (92.31 %) for hepatocellular carcinoma (HCC) diagnosis than using MRI or CT alone; accuracy, sensitivity and specificity decreased to 85.37 %, 86.34 %, and 83.65 %, respectively, for MRI and 67.6 %, 54.10 % and 91.35 %, respectively, for CT. The intraclass agreement of the LI-RADS scores between CT, MRI and combined CT/MRI was excellent (ê=0.9624 (95 % CI: 0.9318–0.9806)).

CONCLUSION: CT and MRI are complementary to each other. Combined CT/MRI enabled a more precise determination of LI-RADS category of hepatic observations; however, due to the expense and minor increase in accuracy, the combined methodology should only be utilized in cases of suspected HCC.

Chong Hyun Suh, Ho Sung Kim, Seung Chai Jung, Choong Gon Choi, Sang Joon Kim

Multiparametric MRI as a potential surrogate endpoint for decision-making in early treatment response following concurrent chemoradiotherapy in patients with newly diagnosed glioblastoma: a systematic review and meta-analysis

OBJECTIVE: To evaluate the value of multiparametric MRI for determination of early treatment response following concurrent chemoradiotherapy in patients with newly diagnosed glioblastoma.

METHODS: A computerized search of Ovid-MEDLINE and EMBASE up to 1 October 2017 was performed to find studies on the diagnostic performance of multiparametric MRI for differentiating true progression from pseudoprogression. The beginning search date was not specified. Pooled estimates of sensitivity and specificity were obtained using hierarchical logistic regression modeling. We performed meta-regression and sensitivity analyses to explain the effects of the study heterogeneity.

RESULTS: Nine studies including 456 patients were included. Pooled sensitivity and specificity were 84 % (95 % CI 74-91) and 95 % (95 % CI 83-99), respectively. Area under the hierarchical summary receiver operating characteristic curve was 0.95 (95 % CI 0.92–0.96). Meta-regression showed true progression in the study population, the mean age and the reference standard were significant factors affecting heterogeneity.

CONCLUSION: Multiparametric MRI may be used as a potential surrogate endpoint for assessment of early treatment response, especially in the differentiation of true progression from pseudoprogression. However, based on the current evidence, monoparametric and multiparametric MRI perform equally in the clinical context. Further evaluation will be needed.

Jiakai Tian and Liang Xu

Color Doppler Twinkling Artifact in Diagnosis of Tuberculous Pleuritis: A Comparison with Gray-Scale Ultrasonography and Computed Tomography

The aim of this study was to determine whether twinkling artifact (TA) detected on color Doppler ultrasonography can effectively determine the presence of pleural calcification compared with computed tomography (CT) and differentiate tuberculous pleuritis (TP) and cancerous pleuritis (CP). One hundred six cases of TP and 26 cases of CP were scanned using gray-scale ultrasonography (GSU) and TA to determine the presence of pleural calcification. With CT as the reference standard, 63.3% and 79.6% of patients with pleural calcification were identified with GSU and TA, respectively. The detection rate of TA was higher than that of GSU (p = 0.039). For the whole study population, 37.1% were identified as having pleural calcification with CT, significantly higher than the proportion detected with GSU (25.8%, p = 0.001), but not different from that detected with TA (41.7%, p = 0.327). The sensitivity, specificity, accuracy, positive predictive value and negative predictive value of TA were 79.6%, 80.7%, 80.3%, 70.9% and 87.0%, respec-tively. The detection rate of TA was significantly higher than that of GSU (p < 0.001). When GSU was com-bined with TA (GSUTA), the positive rate in the TP group was significantly higher than that in the CP group (χ^2 < 0.001). In conclusion, TA is comparable to CT and more sensitive than GSU in the detection of pleural calcification. Evaluation for GSUTA on pleura may help to differentiate TP from CP.