a diagnostic confidence (1 to 3, low to high) and image quality (1 to 5, low to high) score. **Results:** The initial 20 cases included 8 cases for metastatic bone disease in known malignancy and 12 cases for pain generators. Inter-observer agreement for presence or absence of metastases and pain generators was 90% and 85% respectively. Average image quality score by both readers increased from 3.0 for F3D SPECT/CT to 4.7 for xSPECT/CT (p<0.0001). Diagnostic confidence for Reader 1 changed from 2.95 with F3D SPECT/CT to 2.98 with xSPECT/CT (p=0.6663), and from 2.77 to 2.95 for Reader 2 (p = 0.0165). Reader 2 identified an average of 2.3 more lesions on xSPECT/CT vs F3D SPECT/CT compared to Reader 1 with an average of 0.05 more lesions. xSPECT/CT helped identify low grade uptake within smaller joints compared to F3D SPECT/CT, although overall diagnosis was unchanged for the majority of cases. Only one discrepant metastasis case was identified demonstrating mottling of marrow uptake on xSPECT/CT due to tiny sclerotic metastases otherwise only visible on the CT component and not identifiable on F3D SPECT/CT images. **Conclusion:** The xSPECT/CT reconstruction provides potential scope to identify more subtle areas of radiopharmaceutical uptake with better anatomical localisation given the improved image quality. However, our findings demonstrate variable improvement of diagnostic confidence between readers and limited change in overall diagnosis. Further studies are needed to assess the improved clinical efficiency of xSPECT/CT reconstructions. **References:** None.

EP-0853

Optimized PET reconstructions: Can they be harmonized as well?

H. Vosoughi[1,2], *P. Geramifar*[3], *A. Rahmim*[4], *F. Emami*[2], *M. Hajizade*[1], *M. Momennezhad*[1];

[1]*Department of Medical Physics, Mashhad University of Medical Science, Mashhad, IRAN, ISLAMIC REPUBLIC OF,* [2]*Nuclear Medicine Department, Razavi Hospital, Imam Reza International University, Mashhad, IRAN, ISLAMIC REPUBLIC OF,* [3]*Research Center for Nuclear Medicine, Shariati Hospital, Tehran University of Medical Science, Tehran, IRAN, ISLAMIC REPUBLIC OF,* [4]*Departments of Radiology and Physics, University of British Columbia, Vancouver, BC, CANADA.*

Aim/Introduction: PET/CT images are extensively utilized for diagnosis, (re)staging and monitoring treatment response. Preferred protocols should have optimal image quality and detectability with accurate quantification, and as such reconstruction protocols should be optimized. There are significant variations in PET quantification due to differences in scanner hardware and reconstruction algorithms. To tackle the challenge of variability in quantitative values between PET images obtained using different scanners, determination of harmonized reconstruction is very important. **Materials and Methods:** Data acquisition of IQ-NEMA phantom with SBR 4:1, 6:1, 8:1 and 10:1 was performed on a SIEMENS Biograph6 TrueV PET/CT scanner. Raw PET data were reconstructed using 6 different iterations (x subsets) and Gaussian post-smoothing filters with FWHM 2, 4, 6, 8 and 10 mm. In addition, image reconstruction was performed with/without PSF modeling (HD and 3D mode). CNR, COV, percentage difference of CNR, RC_{max}, $RC_{A50\%}$ and RC_{peak} were evaluated for standardization, and were compared with EARL specification reference values. **Results:** CNR and COV improved using smoother filters and fewer iterations. COV was less than cutoff (15%) for all reconstructions of frames >3min. Percentage difference of CNR between FWHM 4 and 6mm for all reconstructions was more than other sequential filter pairs. Though in SBR4:1, the maximum value of CNR of the smallest sphere was 8, it was barely visible, but in SBR6:1, CNR increased to 15. Iterations 30-60 with suitable post-smoothing Gaussian filters harmonized quantitative PET data. There were no difference in RC curves between 3D and HD mode in SBR 4:1. In HD mode, RC_{max} and $RC_{A50\%}$ were overestimated in higher SBRs and higher iterations. Positive bias in RC_{max} and $RC_{A50\%}$ was observed for 13, 17, 22mm spheres caused by PSF-modeled reconstruction, creating edge artifact. However, applying 6mm Gaussian filter and/or using RC_{peak} reduced this bias. Furthermore using CNR as a surrogate for image quality demonstrated that 6 mm Gaussian filter can be appropriate towards optimized as well as harmonized imaging. **Conclusion:** Image quality and detectability in PET images strongly depends on activity to background ratios, reconstruction parameters and post-smoothing filter. The optimized post-reconstruction filter was found to minimize variations of RC in comparison to EARL references. In addition, accurate quantification is feasible utilizing PSF modeling when utilizing appropriate filters. **References:** None.

EP-0854

Regularized Reconstruction Improves Signal-to-noise and Quantification for ^{18}F- PSMA PET/CT Imaging

C. F. Uribe[1], *N. Colpo*[1], *E. Rousseau*[2], *F. Lacroix-Poisson*[2], *D. Wilson*[1], *A. Rahmim*[1,3], *F. Bénard*[1,3];

[1]*BC Cancer, Vancouver, BC, CANADA,* [2]*Universite de Sherbrooke, Sherbrooke, QC, CANADA,* [3]*University of British Columbia, Vancouver, BC, CANADA.*

Aim/Introduction: The popular ^{18}F-labeled PSMA-targeting PET tracer, ^{18}F-DCFPyL, has shown to be significantly superior in detecting metastatic prostate cancer than ^{18}F-FDG. Accurate quantification of ^{18}F-DCFPyL images can enable evaluation of therapeutic efficacy, comparison between centres, and the potential to build outcome predictive models. Ordered subsets expectation maximization (OSEM) is commonly used to generate PET images, but noise is amplified at high number of iterations. As such, limited iterations are used in practice to maintain adequate image quality; however, this may not be sufficient to achieve convergence and leads to lower standardized uptake values (SUV). The block sequential regularized expectation maximization (BSREM) algorithm, also called Q.Clear (GE Healthcare), allows convergence while avoiding noise amplification at higher number of iterations. In