AbstractID: 9864 Title: PET/CT and Image Fusion Issues

The recent development of hybrid machines capable of making both Positron Emission Tomography (PET) and x-ray Computed Tomography (CT) scans on a patient has greatly increased interest in PET imaging. The combination of modalities has both technical and medical advantages. The CT scan permits rapid acquisition of the attenuation correction data for the PET scan, resulting in a significant reduction in scan time. The extremely good registration between the physiological PET image and anatomical CT image then allows the reading physician to draw far more precise conclusions as to the nature and location of the patient's disease. This paper will outline the underlying technical issues of PET/CT technology and the PET/CT facility, discuss specific quality assurance problems, and demonstrate some of the image artifacts that arise in PET/CT practice. Sometimes it may still be necessary to merge data from non-hybrid machines or the registration of images from dedicated PET/CT scanners may fail. Some of the image fusion issues that arise in these cases will also be discussed.

The learning objectives for this talk are to

1) outline the basic technology of PET/CT and consider the characteristics of this hybrid imaging modality,

2) examine specific quality assurance issues for PET/CT,

3) demonstrate examples of image artifacts found in PET/CT practice and discuss their causes, and

4) discuss image fusion techniques that may be required when registration has failed or when images from non-dedicated PET/CT equipment must be used.