Phantom Projects: Physical & DRO

Acquisition & Reconstruction
Objective: To determine the acquisition parameters and reconstruction methods for measuring SBR in [123]I ioflupane SPECT with higher precision and reduced bias.

Question 1: What is an adequate count level for good quantification?
When does accuracy and precision break down?
Is the same true for FBP and OSEM?
What about the OSEM remapping constraint?

Question 2: What are the effects of physical corrections?

Attenuation Correction
Correction for Scattering (Septal Penetration)

Resolution Modeling
- What are the effects of overscan (Gibbs artifact)?
- What is the effect of varying resolution?
- Are we seeing a move toward MEGIC correction?

Imaging Biomarkers

Further investigations are needed to better understand the relationship between DOPA and accumulation in dopaminergic neurons relative to the clinical progression of PD. Critical to this is the development of imaging biomarkers to assess the natural history and progression of the disease as well as to assess the effect of treatments to prevent or slow disease progression.

The Phantoms are measured and simulated on software programs and in the clinic to determine SBR and T1w brain volumes in various stages. The SPECT images are divided into three stages to determine the accuracy of the involved parameters. The data obtained from experiments are used to determine the accuracy of the SPECT images.

The objective of the study is to determine the accuracy of the SPECT images in various stages of the disease. The results of the study will be used to determine the accuracy of the imaging biomarkers.

The study will be conducted in two phases. In the first phase, the SPECT images will be analyzed to determine the accuracy of the imaging biomarkers. In the second phase, the imaging biomarkers will be used to assess the accuracy of the SPECT images.

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