General Reconstruction Introduction, FBP vs. Iterative Reconstruction

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This session will give a short introduction into the ideas behind FBP (filtered back projection) and iterative image reconstruction techniques from projection data. FBP is a very old technique (1) and was the first one to be applied for medical image reconstruction (2) in CT. The big success of that approach in case of CT might be a reason for the use of the same technique in case of nuclear medicine.

We will show what are the drawbacks and limitations of using FBP for nuclear medicine data beginning from the limited number of projections and ending in the most important characteristic of images in nuclear medicine: the inevitable noise.

Noise will lead us to an alternative way of doing reconstructions: iterative reconstruction methods. These methods have been introduced into medical imaging about a decade later (3) and are still subject to improvement and innovations these days. We will discuss the reasons why this approach is much more suited by looking at examples.

At the end of the session we will conclude that iterative reconstruction techniques after being widely accepted in nuclear medicine now entering low dose CT, inverting somewhat history.

References

