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## Spectral analysis: principle and clinical applications

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This review article describes the principle and clinical applications of spectral analysis. Spectral analysis provides a spectrum of the kinetic components which are involved in the regional uptake and partitioning of tracer from the blood to the tissue. This technique allows the tissue impulse response function to be derived with minimal modeling assumptions. Spectral analysis makes no *a priori* assumptions regarding the number of compartments or components required to describe the time course of tracer in the tissue. Spectral analysis can be applied to various dynamic data acquired by planar scintigraphy, single photon emission computed tomography (SPECT) or positron emission tomography (PET) as an alternative approach to compartment analysis. This analysis appears to be clinically useful, because it not only facilitates the interpretation of dynamic scintigraphic, SPECT or PET data, but also simplifies comparisons between regions and between subjects.

**Key words:** spectral analysis, principle, clinical applications, compartment analysis, dynamic scintigraphy, SPECT, PET